
Beacon Pathway Submission to *Powering Auckland's Low Carbon Transformation*

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What is Beacon?

Beacon Pathway Incorporated (Beacon) aims to transform New Zealand's homes and neighbourhoods to be high performing, adaptable, resilient and affordable. To achieve this, Beacon uses demonstrations and monitoring to provide proof of the benefits of improving New Zealand's housing stock.

The Incorporated Society builds on the successful research programme completed by Beacon's original consortium which developed a whole-of-house approach to improving the performance of both new and existing homes, using demonstrations and monitoring to provide proof of the benefits of improving New Zealand's housing stock. Much of this work was developed with Waitakere City Council and is available free of charge on the Beacon website www.beaconpathway.co.nz. Tools developed by Beacon include:

- *Policy Options for Sustainable Homes: A Resource Manual for Local Government* - this provides an overview of the range of tools available to councils to encourage people to make more sustainable choices in their homes and neighbourhoods
- Neighbourhood Sustainability Framework – a framework and tools to measure the sustainability of neighbourhoods
- HSS High Standard of Sustainability® – performance benchmarks for a sustainable home which take a whole-of-house approach to improving the performance of both new and existing homes. This encompasses energy, water, indoor environment, waste, and material/product selection.
- A HomeSmart approach to assessing existing homes and developing a renovation plan – this underpins the Retrofit Your Home initiative.

Beacon believes that these tools and approaches can contribute to achieving the low carbon vision set by the Auckland Plan and extends an offer of support to Council to work collaboratively in exploring some of these tools and approaches in the Auckland region.

Beacon's Members include: Christchurch City Council, EECA, New Zealand Steel, Fletcher Aluminium, Certified Builders, Resene and Insulpro Manufacturing.

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1 Beacon's Comments

Beacon congratulates Auckland Council in taking a leadership role in energy and climate change mitigation. This is a critical area of work identified in the Auckland Plan and a step change in Auckland's approach to energy and climate change mitigation will be required to achieve the vision – *the world's most liveable city*. Targets of reducing greenhouse gas (GHG) emissions by 40% by 2040 (from 1990 levels) will not be achieved by delivering business as usual. The target is bold and will require innovative solutions and hard decisions to encourage and require the major changes in behaviour needed.

While the discussion document recognises that other stakeholders have a role to play in climate change mitigation and energy, the importance of taking a collaborative approach in developing policy and undertaking actions needs to be strengthened. Council, its Local Boards and council-controlled organisations (CCOs), along with businesses, citizens, central government and other organisations, all have a critical role to play.

Auckland Council can play a lead role in a number of areas including strategy and policy, regulation and incentives, facilitating collaborative approaches to actions, demonstrations and, where appropriate, delivery. It is critical that all parts of Council, including CCOs work towards delivering on Council's climate change targets.

Our action is needed now. While it is important to create this discussion document and a subsequent strategy, it is ultimately our action or inaction which will cement our future. Current energy and climate change activities are not enough to make the step change required.

Beacon Pathway's specific comments on section – *Why do we need a strategy?*

- P11, paragraph 2 identifies that energy efficiency and conservation is a key opportunity in the short term for a more secure energy future. Beacon submits that energy efficiency and conservation are critical in both the short-term and long-term to ensure energy security and a sustainable future.
- P13, paragraph 4 – Beacon Pathway submits that it is critical that actions be undertaken now. To achieve the targets set in the Auckland Plan and any actions identified in the Energy and Climate Change Mitigation Strategy, it is likely that funding not currently identified in the LTP will be required. Funding for these activities will need to be considered either within existing projects or as part of the 2013/2014 and 2014/2015 Annual Plan processes as well as in future Long Term Plans.
- P13, paragraph 5 states that "*The Energy and Climate Change Mitigation Strategy will help to guide the policies and rules in the new Unitary Plan.*" The Energy and Climate Change Mitigation Strategy is due for completion in December 2012 and the Auckland Council website identifies that the draft Unitary Plan will be completed by December 2012. Therefore, ongoing dialogue is required between those parts of Auckland Council involved in energy and climate change mitigation and the Unitary Plan as each stream of work is developed.

The Unitary Plan must focus on moving the city to a more sustainable, resilient and low carbon future with quality housing and neighbourhoods. Work undertaken by Beacon on local government barriers to building more sustainable homes and the range of policy options available to councils to support sustainable building is available at www.beaconpathway.co.nz/further-research/article/a_resource_manual_for_local_government.

- P13, paragraphs 5 and 6 –The Energy and Climate Change Mitigation Strategy must be developed collaboratively with a wider range of partners than included in this section. Particular emphasis should be placed on working collaboratively with business.

The final strategy and any implementation plan will need to address the interlinkages between actions, their timings and other targets and goals in the Auckland Plan. For example, achieving a 40% reduction in carbon emissions will be difficult alongside the pursuit of higher economic growth and a GDP increase. Council will need to work hard to decouple some of these competing targets, taking innovative strategic approaches at a council level and greater Auckland level.

Opportunity 1: Providing greater transport choice and reducing private motor vehicle dependency

The transport sector is responsible for more than half of Auckland's GHG emissions, and therefore should be a critical area of focus for the Auckland Council, central government, business and other stakeholders.

This section needs to strengthen the link between good quality urban design, transport choice and private motor vehicle dependency. Beacon supports activities to realise a quality compact city, with good design in all development. This includes intensification to medium density development around transport hubs (below five storeys). Housing and neighbourhood sustainability, both in terms of new build and retrofit, are key aspects to developing a resilient city.

Opportunity 2: Reducing reliance on fossil fuels for transport

Beacon supports the development of an integrated transport network, with the prioritisation of cycling, walking, slow streets, public transport and connectivity. This is a transport network which supports land use, provides for all people, but most importantly addresses issues of sustainability and resilience – climate change, the adverse health impacts from transport, peak oil and resource availability.

The section raises a number of important opportunities to reduce reliance on fossil fuels for transport including improved vehicle efficiency, biofuels, electric vehicles and on-going public transport improvements. However, it fails to acknowledge the importance of reducing travel as

probably the key means of reducing reliance on fossil fuels. This can be achieved by a myriad of activities including improved urban design, provision of local services, public transport improvements and push measures such as road pricing and taxes.

Opportunity 3: Reducing the consumption of energy in Auckland's buildings

Auckland has roughly one third of New Zealand's housing stock, most of which are performing poorly. For example, 294,000 of houses in Auckland were built before 1979, the first full year in which insulation was mandatory, and a further 138,000 built between 1979 and 2000, a period when insulation standards were poor. Over half of the housing stock of 2040 already exists in today's houses. Recognising this, older homes will need to be retrofitted to reduce energy use, help address health inequalities, and reduce the cost to residents of keeping their houses warm and dry.

A number of excellent programmes exist focussed on increasing the performance of existing homes such as Retrofit Your Home and EECA's Warm Up New Zealand. However, actions are required to further stimulate the retrofit market, both in terms of the number of houses being retrofitted and the scope of the activities. The current \$6m annual funding of Retrofit Your Home allows for the retrofit of approximately 1200 homes per annum and take-up of the Warm Up New Zealand has been slower in Auckland than other parts of the country. Current programmes also have a strong focus on insulation and heating and need to be expanded to have a whole-of-house focus e.g. other forms energy use such as lighting.

Beacon's National Value Case for Sustainable Housing Innovations shows that there are clear national benefits to encouraging housing improvements on a wider scale. In particular, it shows the economic value to New Zealand including:

- Direct savings in household energy consumption amount to almost 22 PJ per year, or enough to power over 500,000 New Zealand homes for a year
- A reduction in CO₂ emissions of 3,600kt per year, the equivalent of \$54 million in tradable emissions (at \$15/tonne)

It is critical that new high performing homes are built in high performing neighbourhoods. Beacon has developed a Neighbourhood Sustainability Framework and Assessment Kit which provides a robust evidence-based tool that Auckland Council could use. The Unitary Plan and Design Manual must address the fundamentals of building performance as a continuum of good practice from subdivision layout (for maximum solar gain) through design and build. Best practice needs to occur in all developments, not just ones located in the proposed low carbon/low energy precincts (p21). Council needs to work with players across the supply chain to achieve best outcomes.

Beacon supports suggested activities such as a residential rating tool and requiring property owners to report on energy performance at point of sale and lease (p21). Another similar programme which should be investigated is a housing Warrant of Fitness for rental properties. How these are implemented will influence their success – implementation must be undertaken in a way to achieve maximum buy-in from stakeholders and include incentives to address poor performance.

Beacon recommends that Council develop a pilot example of affordable, sustainable urban living in partnership with key stakeholders such as NZIA, DBH, NZPI, social housing providers and developers. This has the potential to shape and inspire modern urban living in Auckland by delivering a new inner-city neighbourhood of medium density and mixed-use homes, based on affordable design principles. It could become a model whereby the city could potentially generate more energy than it consumes, conserve/recycle water and deliver living/working environments which are carbon zero and incorporate restorative sustainable design. It can also contribute to the industry learnings, tools, incentives and education needed to shift approaches from currently accepted practice to a more sustainable way of doing things.

Best practice design must also be incorporated into non-residential development, from subdivision location and design, through building design and implementation.

Opportunity 4: Managing the growth in Auckland's peak demand for electricity

To achieve the targets set in the Auckland Plan for reduction in GHG emissions, Auckland and New Zealand must focus on reducing its overall and peak demand for electricity, not just *“manage its future growth in maximum demand so as to prevent or defer unnecessary additional upgrades of the electricity network (p24).”*

Achieving a reduction in energy growth will require strong buy-in and input from all sectors - domestic, commercial, industrial and government. Actions will need to make economic sense to engage a broad range of business.

Beacon Pathway supports the approaches outlined in the discussion document including smart-technologies, demand management, efficiency activities, and diversifying the supply including embedded generation. However, reducing peak energy consumption will require behavioural changes as well as technological change.

Beacon Pathway's comments on *Opportunity 3- Reducing the Consumption of Energy in Auckland's Buildings* also apply to this section, specifically the need for the retrofit of existing buildings to improve performance and the development of high performing new buildings and neighbourhoods.

Opportunity 5: Diversifying Auckland's electricity generation options

Beacon Pathway believes there is potential to increase the proportion of energy supplied from local renewable sources, either at house level or at a community/neighbourhood scale. The advantage to homes of utilising local renewable energy is a greater resilience in the face of drought-driven electricity shortages and a reduction in the demand on our electricity infrastructure. Local renewable energy generation can advance and strengthen New Zealand's energy system by complementing the current centralised energy system and making better use of the wealth of resources available in this country. Beacon research shows that local energy systems have the potential to displace as much as 16,000 GWh per year of electricity from large power stations in 30 years time, or much sooner if there is government support. This amount is more than the electricity consumed by the entire residential sector in 2005 (12,732 GWh).

Beacon Pathway supports Auckland Council investigating and supporting options for the diversification of Auckland's electricity generation including embedded generation. This support must include enabling mechanisms in the Unitary Plan and Design Manual for local sustainable electricity generation.

Opportunity 6: Providing for Auckland's energy infrastructure

Beacon Pathway supports activities to increase the resilience of the energy network, however this must be undertaken in the context of actions to reduce GHG emissions by 40% by 2040.

Opportunity 7: Greening Auckland's growth and developing a well-functioning city

Beacon Pathway supports the below solutions identified as part of opportunity 7, and provides comment.

- Supporting business and green growth; and
- Developing a well-functioning City.

Supporting business and green growth

The next 30 years will provide significant challenges to the economy of Auckland from the perspective of energy price increases, resource availability and energy security as well as vulnerability to global economic events. A holistic economic development approach (p35) must focus on delivering a more resilient and self-reliant economy, not one highly reliant on exports and high energy use. This includes working with businesses to deliver environmentally responsible business operations and facilitating local economic development. For example, Beacon research for the 2009 Jobs Summit showed that retrofitting 1000 standard 1940-1960

homes for improved performance¹ would create a total of 392 full time equivalent jobs to provide the products and services involved in the renovation activity.

A sustainable eco-economy goes beyond developing green products and services, it supports the resilience of the environment and people, provides local jobs in enterprises that contribute to wellbeing and quality of life, and minimises negative impacts on environment at all stages of the production and consumption cycle. Unless Council works closely with businesses to deliver environmentally and socially responsible business operations, the development and manufacture of eco-technologies and approaches in Auckland could result in negative local environmental and societal effects.

Developing a well-functioning City

Beacon supports the realisation of a quality compact city with intensification around transport hubs. This will require an urban design framework with a strong emphasis on resilience, low impact design, demand management and diversity of infrastructure supply.

Beacon's research has identified that medium density mixed-use is a sustainable neighbourhood form which brings benefits to a city. The opportunity is to plan, design and retrofit Auckland neighbourhoods to realise the liveable city vision. Beacon proposes its Neighbourhood Sustainability Framework and Assessment Kit as a robust evidence-based tool for Auckland Council to use. Beacon research indicates that the highest costs to the economy, environment and to homeowners occurs during the operation of a home. Therefore, strong emphasis should be given to quality design and retrofit to optimise operational performance. The Energy and Climate Change Mitigation Strategy must focus on improving the existing housing stock, high quality future housing, sustainability and affordability.

Beacon's research shows that councils that want to successfully promote more sustainable homes can make it easier for homeowners to build and retrofit more sustainable homes. In partnership with councils, Beacon has developed a Resource Manual to support improved housing outcomes.

Opportunity 8: Reducing non-energy emissions and increasing carbon sinks

Beacon Pathway supports actions to reduce the amount of waste produced and submits that Auckland Council explore ways to reduce the amount of construction waste going to landfill, including the use of construction waste bylaws as used in Christchurch.

¹ *A standard renovation package has been assumed incorporating ceiling and under-floor insulation, ground polythene vapour barrier, wall insulation, efficient heating device, heat transfer system, solar hot water heating, low flow water devices and low flush toilets, rainwater tank, hot water cylinder and pipe wraps, extract fans in kitchens and bathrooms, double glazing retrofitted into existing timber window frames (or secondary glazing/thermal curtains), on-site assessment of house and project management.*

Implementation

Beacon supports the four implementation points identified on p42, requiring:

- multi-sector commitment and actions
- both near-term and long-term goals
- reprioritisation of funds; and
- ongoing monitoring and evaluation.

Critical is the delivery of actions to achieve the targets, not rhetoric. Beacon Pathway has an extensive body of knowledge on high performing homes and neighbourhoods, much of which is available free of charge on the Beacon Pathway website.

2 Appendix One: Beacon resources

2.1 Neighbourhoods

Neighbourhood Sustainability Framework and Assessment Kit

Beacon's Neighbourhood research team has developed a framework and tools to measure the sustainability of New Zealand neighbourhoods. The Kit is available free to help planners, designers, neighbourhood managers and developers identify, discuss and prioritise changes to improve the sustainability of both new and existing neighbourhoods.

Opportunities for councils include using the tool to:

- Assess all new neighbourhood developments and potentially to set a minimum threshold for new developments to meet
- Assess for reductions in development contributions
- Fast-track desirable developments
- Assess existing neighbourhoods to guide resourcing decisions and draw out the critical issues for neighbourhood improvement and planning.

Download from

www.beaconpathway.co.nz/neighbourhoods/article/the_neighbourhood_sustainability_framework

The value of neighbourhoods

Beacon's research has identified that low density non-mixed use (e.g. neighbourhood that are almost entirely residential) generate net costs rather than net benefits for a city. As a corollary, mixed use, medium density neighbourhoods are of value to cities. Research which awarded monetary values to different neighbourhoods showed that a sustainable neighbourhood is worth \$1,362 per household compared to a negative value of \$595 per household for NZ's least sustainable neighbourhoods.

Find out more at

www.beaconpathway.co.nz/neighbourhoods/article/valuing_sustainable_neighbourhoods

2.2 Homes

HSS High Standard of Sustainability®

A sustainable home is the sum of its parts. Beacon's focus is on whole-of-house sustainability - encompassing energy, water, indoor environment, waste and material/product selection. Taking this approach, we have developed a set of performance benchmarks to achieve a sustainable home - the HSS High Standard of Sustainability®.

See www.beaconpathway.co.nz/being-homesmart/article/beacons_hss_high_standard_of_sustainability

Policy Options for Sustainable Homes – A Resource Manual for local government

Beacon Pathway has conducted research into the council-induced barriers to building and renovating high performing homes. The research found that policy and regulatory barriers to sustainable building choices exist in:

- administering the Building Act and Building Code
- inflexible conventional infrastructure standards (particularly for water)
- District Plan provisions that provide no allowance for sustainable designs such as passive solar orientation or features such as rainwater tanks (e.g. traditional development controls for height, yards, and height-in-relation-to-boundary).

Councils throughout New Zealand have developed a range of initiatives to encourage people to make more sustainable choices in their homes and neighbourhoods, and are seeing some good results. The Resource Manual provides an overview of the range of tools available to councils, and gives detailed examples of policies and practices already in place in New Zealand. Beacon recommends that Auckland Council explores a number of the options outlined in the Resource Manual to assist in realising the visions outlined in the Auckland Plan.

Download the Manual from www.beaconpathway.co.nz/further-research/article/a_resource_manual_for_local_government

National Value Case

Beacon's *National Value Case for Sustainable Housing Innovations* showed that there were clear national benefits to encouraging housing improvements on a wider scale. In particular, it showed the economic value to New Zealand of:

- Direct savings in household energy consumption amount to almost 22 PJ per year, or enough to power over 500,000 New Zealand homes for a year
- A reduction in CO₂ emissions of 3,600kt per year, the equivalent of \$54 million in tradable emissions (at \$15/tonne)
- Direct water savings of 130 million m³/year.

Download from: www.beaconpathway.co.nz/further-research/article/the_national_value_case_for_sustainable_housing

2.3 Expertise

Beacon Pathway has considerable expertise in the sustainability of New Zealand homes and neighbourhoods and has worked extensively with local councils. We welcome the opportunity to further discuss how we can help with Auckland Council and local boards.