

Facing

Newsletter of Beacon Pathway

May 2007



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It's official – the NOW Home® saves energy and water

The results of the first year of performance monitoring are in, and it's clear that the Waitakere NOW Home® has performed well. Energy and water savings, a healthy indoor environment, and an improved quality of life – these are the benefits our tenants are reaping.

So how has it performed?

Water efficiency

The figures show **40% saving** compared to the average in surrounding Waitakere City - and more than **66%** saving compared to average use in the Auckland region. The key factor in such high water savings is the rainwater tank, but the low flow, dual flush toilet is also a significant factor and is delivering excellent water efficiency.

Space heating

The tenants also report finding the home very warm to live in. They needed to use a space heater on only a couple of days during the year. The winter mean temperatures for living rooms and bedrooms all exceeded World Health Organisation minimum of 18°C for living areas and 16°C for bedrooms (compared to 30% of New Zealand homes which regularly don't meet these standards).

Space heating typically accounts for 30% of a household's energy expenditure, so designing and building a house which retains solar warmth – the sun's free heat - can lead to considerable savings.

Water heating

The solar hot water system provides for **more than half (55%)** of the tenant's water heating needs. That's equivalent to a saving of 2500kWh or about \$425 on water heating alone. This would mean a payback period of approximately 10 years for the system.

Water heating is an area where households can make significant cost and energy savings. It accounts for 28% of household energy use, so the designers chose to install a solar water heater.



Overall energy savings

Overall the Waitakere NOW Home® has used 7400 kWh per year or **33%** less than an average 4 person household with school age children. This is also **45%** less than the tenants' energy use in the house they occupied over the year prior to moving into the Waitakere NOW Home®. The tenants are thrilled with this result, and say the NOW Home® experience has made them very fussy in looking for houses in the future.

Humidity

This is the first major project where home humidity has been measured, so it is difficult to know how the Waitakere NOW Home® performs relative to others. For most of the time in both summer and winter, humidity inside the house has been within the acceptable range for human health (25-75%). Given that the humidity levels in Auckland frequently exceed 75%, the house is clearly performing well.



Visitors learn about the efficiency features of the Waitakere NOW Home®

Beacon Pathway is a collaborative research consortium of organisations with a considerable stake in the quality of the residential sector: Building Research, Scion, Waitakere City, Fletcher Building and New Zealand Steel

Enjoyment of the home

The tenants give the house an overwhelming vote of confidence. They particularly appreciate the layout of the rooms, the openness, absence of hallways or corridors, and clever use of spaces. This may seem surprising as the 'footprint' of the home is relatively small. But for the tenants, "everything seems bigger". There is a real appreciation of how the spaces relate, the indoor-outdoor flow, and an overall sense of greater freedom of movement.

Although they arrived at the tail end of 2005 winter, the tenants didn't even unpack either their space heater or dehumidifier – both of which were used continuously at their previous Auckland house. They now describe themselves as the 'Pink Batts family' (after the TV advert), because they don't want to leave the house when the weather's bad. They love the concrete floor, too – it's easy to clean and it keeps the home warm and temperatures even. Their children's asthma has also improved.

Perhaps most importantly, the tenants believe living in the home has significantly and positively affected the way they interact as a family: – it's warmer, drier, healthier, more affordable and more comfortable than any they've lived in.



Beacon Board member, Judy Morgan from New Zealand Steel, and General Manager, Nick Collins, discuss the Building Code changes with the Prime Minister and Hon Clayton Cosgrove

Government releases Building Code changes at NOW Home®

The Government recognised Beacon's progress in proving the benefits of more energy efficient homes by releasing the energy efficiency changes to the Building Code at the Waitakere NOW Home® on Thursday 3 May.

The Prime Minister, Rt Hon Helen Clark, and the Minister for Building and Construction, Hon Clayton Cosgrove, announced that new homes would be expected to use 30% less heating energy to achieve the same indoor temperatures. Homeowners will have the flexibility to choose the insulation and design features that best suit their needs. Window double glazing will be necessary in most cases but it will be possible to retain single glazed windows in warmer climates providing attention is given to house orientation window size and design features. Existing houses will only be affected if extensions are undertaken only the extended area will have to be insulated to the new requirements.

A new Building Code Compliance document will lower the cost of installing solar water heaters by as much as 10% or \$500 and make it easier to have solar water heating installed.

The Government argues that, while these enhancements could cost between \$3000 and \$5000 per new house, there would be lower energy costs over the life of the house, and better temperature control in both hot and cold weather, and healthier living. The Waitakere NOW Home® results support this with a 33% saving over similar houses.

To read more about the new measures:
www.dbh.govt.nz/news-index



Sustainable Living: Beacon's Research Symposium

For three years, Beacon has worked to research, define and promote sustainable residential design and construction. It's high time to share our findings and plans for future research with all those who have a stake in the future of New Zealand's housing.

In May, Beacon will hold a symposium to present key research findings and proposed developments to stakeholders. We'd love you to join in the debate and discussion about our shared future and the opportunities it brings to add value to your operations.

Sustainable Living: Beacon's Research Symposium

Wednesday 30 May, 9.30am – 4.00pm

Large Lecture Room, Science House, Royal Society of New Zealand, Turnbull Street, Wellington

Entry to the symposium is free. If you would like to come along, or know other people who might be interested, please contact Wendy Briggs:

wendyb@beaconpathway.co.nz

or

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Symposium Topics

Introduction to Beacon: its vision, strategy and goals

Beacon's strategic focus is on the research areas which will have the most impact in bringing 90% of New Zealand homes to a high standard of sustainability by 2012. One focus is on improving not just new homes, but the nation's 1.6 million existing houses.

NOW Homes®: how to live more comfortably

Beacon's NOW Homes® test the design and performance of a house built to a High Standard of Sustainability. They use the best design, products and practices available currently, and are designed to be warmer, drier, healthier, resource-efficient and cheaper to run.

Retrofit homes: an analysis of energy, water and indoor environment quality

Beacon's NOW Homes® Renovation Project in Papakowhai, Porirua, is monitoring the performance of ten houses before and after installation of energy, water, waste, and indoor environment quality improvements.

Renewable technologies: what's here and what's around the corner?

Sustainable homes can be built with what is available today. However gaps in the market must be identified, and technical constraints which prevent consumer uptake of sustainable products need to be addressed.

Policy and regulation for sustainable buildings: incentives or barriers?

Beacon has addressed the barriers and incentives to sustainable buildings in both central and local government policies, through submissions and reviews of council planning frameworks. We believe there is a need for both incentives for homeowners and an improved level of regulation requiring high rather than minimum standards.

Market Transformation: how to accelerate change?

Two consumer surveys have shown the current extent of sustainable technologies and behaviour in New Zealand homes, and the factors likely to influence people to adopt these.

Smarter Homes and Homesmarts: a web-based guide to sustainable buildings for consumers

Beacon joined with Consumers' Institute and Creo Communications to develop an on-line resource providing independent information on sustainable design and construction to homeowners for the Ministry for the Environment. In addition, a web-based tool, Homesmarts, will enable homeowners and occupiers to get personalised information about ways to improve the sustainability of their home.

Neighbourhoods: sustainable living and urban consolidation

Beacon is looking beyond the individual house to improving the sustainability of New Zealand neighbourhoods. The first step has been to develop a framework to evaluate the sustainability of New Zealand neighbourhoods.

What makes a high standard of sustainability in the residential built environment? Beacon's research so far

Beacon has developed a High Standard of Sustainability for an individual home which sets out key performance indicators against which Beacon is benchmarking the sustainability of a house.

Waste: reviewing the current situation

Despite the introduction of numerous waste minimisation initiatives over the last decade, solid waste disposal to landfill appears to be continuing to increase (on a per capita basis). The solid waste generated from the Residential Built Environment is relevant to Beacon's efforts to improve the overall sustainability of a house. This waste includes:

- Construction and demolition waste: Solid waste created during construction of new homes, as well as during renovation, retrofitting and deconstruction of existing homes.
- Domestic waste: Solid waste that is created by consumers during the life of a home, as termed 'domestic waste'.

The Scoping Waste report was commissioned to give Beacon a better understanding of the current solid waste management framework and to define potential opportunities for waste minimisation efforts. If solid waste disposal to landfill continues to increase, there needs to be a major step-change, including improved design for sustainability, waste reduction at the front-end and improved extended producer responsibility and product stewardship.

Scoping Waste is available at:
www.beaconpathway.co.nz/research+reports.aspx



Sorting construction waste during the construction of the Waitakere NOW Home®

Photo: Robin Allison

Encouraging student research

In 2006 Beacon sponsored four final year engineering students from the University of Canterbury to conduct a year-long project to develop a Pathway Navigator which would help motivate homeowners to make sustainability-focused renovations.

The team of Nick Yannakis, Olivia Chung, Sean Hart and Matthew Halverson was mentored by Barbara Nebel (Scion) on Beacon's behalf.



The project focused on residential properties in the Christchurch region built prior to 1977. In motivating homeowners to renovate their homes, research was directed at technologies and retrofitting measures that specifically improve the indoor air temperature and health of the occupants.

The team developed the Pathway Navigator Concept into a prototype website which motivates and guides homeowners to form an action plan for a home upgrade. The website, presented on slides, was presented to homeowners and a survey gathered feedback and suggestions for its improvement. Overall results were positive, showing an increase in homeowners' motivation levels, and overall satisfaction with its features.

Retrofit and Sustainability Analysis for Today's Homes is available at:

www.beaconpathway.co.nz/research+reports.aspx