

February 2008

# Facing

Newsletter of Beacon Pathway



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## Improving our existing homes

Beacon's goal, to bring 90% of New Zealand's houses to a high standard of sustainability, can only be achieved by addressing the state of our 1.6 million existing homes. The good news is that New Zealand homes can be renovated, using current building solutions, to deliver warmer, healthier homes which are more comfortable, more affordable to run and have lower demand on our nation's energy supply.

In Papakowhai, Porirua, Beacon has renovated nine homes with a range of features and technologies to identify the measures and features which most improve the performance. Results from the Papakowhai project are now feeding into Beacon's key research and market transformation project: The NOW Home® Renovation Project.

### 1000 homes

Beacon has an ambitious plan to renovate 1000 houses around New Zealand – the NOW Home® Renovation Project. These houses will be brought to a High Standard of Sustainability™, Beacon's performance benchmarks to measure a sustainable home.

Unlike other programmes, the NOW Home® Renovation Project focuses on **whole of house solutions** extending beyond energy efficiency initiatives (insulation, space heating, lighting, hot water and appliances), to water (low flow shower heads, dual flush toilets and urban rainwater tanks), waste and indoor environment quality. These measures are intended to improve the resource efficiency of the whole home, and to ensure a healthy indoor environment.

The performance of homes in the Project will be monitored for energy and water use, indoor temperature and humidity – before and after renovation. Homes will also have a Home Energy Rating Scheme (HERS) assessment.

### Becoming involved

Beacon is keen to engage a number of key organisations with a large vested interest in the residential built environment in the NOW Home® Renovation Project, including commercial retrofit and renovation companies, product manufacturers / suppliers, local authorities, community trusts and energy / water utilities.

Our first partner for the NOW Home® Renovation Project is **EnergySmart**, a leading provider of simple but effective energy efficient measures to New Zealand households across the country. Visit their website at [www.energysmart.co.nz](http://www.energysmart.co.nz)

Beacon will be looking for homeowners keen to improve their homes' performance to reach a High Standard of Sustainability and able to fund the retrofits in the second half of 2008, either themselves or with assistance from EECA's interest free loans for the energy efficiency upgrades.

If you think this is of interest for you, start with assessing the potential for improvement in your home on the HomeSmarts website: [www.homesmarts.org.nz](http://www.homesmarts.org.nz). HomeSmarts is a tool which gives individualised advice on whether a particular home measures up to recommended standards and how to create a better living environment.

**Enquiries to: Lois Easton, Research Team Leader**  
[loise@beaconpathway.co.nz](mailto:loise@beaconpathway.co.nz)

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

## A Focus on Water

By Dr Maggie Lawton, Water Research Team Leader

The current drought was predicted; it's the result of a La Nina period, part of the oscillation of weather patterns in the Southern Hemisphere with the better known El Nino at the other end of the oscillation. Paradoxically, while La Nina usually brings wetter weather to some parts of the globe including the far north of New Zealand, both La Nina and El Nino cycles bring drier weather and this time the drier-than-normal weather is forecast to remain until April. To what degree this oscillating weather pattern is exacerbated by climate change is unclear; there is some evidence that the oscillations that bring droughts to New Zealand have been occurring more frequently in the last couple of decades but, for many scientists, the jury is still out.

Still, La Nina aside, climate change is predicted to lead to more frequent weather extreme events so good risk management would suggest that New Zealanders need to prepare for that eventuality. The plight of farmers is well known during both droughts and floods but urban dwellers will also be impacted and need to reduce their own risk as well as their drain (excuse the pun) on the country's water resources. Yet many people in New Zealand still don't recognise the costs, both financial and ecological, of the water delivered to their household taps and think it should be a free good, a basic right with no cost attached. Some serious education is required and volumetric pricing so people pay for what they use.



A corrugated slimline tank from Tanks Alot  
[www.tanksalot.co.nz](http://www.tanksalot.co.nz)

### Why save water?

So why should we as householders reduce mains water as part of a wider consideration of sustainable living? The reasons include:

- Capital cost savings through delaying or eliminating water supply and wastewater infrastructure development which will ultimately help to limit rate raises, whether water is paid for directly according to use volume or as part of the general rates.
- Reducing infrastructure and consumer costs for water and energy associated with water provision. The energy costs, for water delivery and disposal and for water heating in the home, are often overlooked.
- Reducing water use and wastewater levels which will have a positive impact on maintaining flows in rivers, sustaining acceptable lake levels, reducing the amount of chemically treated water that seeps into the environment through faulty pipes and keeping wastewater spillages into rivers and harbours to a minimum.
- Finally as mentioned, improving the resilience of the water supply system against expected climate perturbations.

### Is reducing mains water use difficult to do?

Not at all, it can be done without significant behaviour or lifestyle changes although water use awareness and responsible use is also to be encouraged. New water fitting, fitments and appliances can make a significant difference to water use for showers, washing clothes and dishes and wastewater volumes from toilets.

Water for outdoor use can be supplemented by new slimline rainwater tanks, the cost of which, if you are an average household paying for water directly, will be recuperated within 10 years with reduced water bills from then on. It's time that all new homes came with the best water fitments available and the opportunity for supplementary water supply or water reuse; especially essential for those areas with high summer outdoor water use.

## Beacon's water research

Beacon's role in water management has initially been to look at the policy and regulations which would assist water supply authorities to introduce demand management and seriously consider it as an alternative to new water supply infrastructure. Following a review of demand management policy in New Zealand and around the world, we are now partnering with local authorities that are considering demand management strategy. Beacon will also research how to better define the value proposition, both for water supply demand management and the integrated management of water supply with wastewater and stormwater "three waters management". At the same time Beacon will contribute to local and national water policy development and work with industry sectors to ensure they can deliver on efficient and readily available water management systems.

Current water services are based on a model developed in the 1800s. Population and resulting resource use has expanded massively since that time. It is time to change the way we manage water and move beyond the inefficiencies of past centuries.

Dr Maggie Lawton leads Beacon's water research team. Maggie has extensive experience in DSIR and Crown Research Institutes, including 11 years at Landcare Research, specialising in land use, catchment management, urban development and climate change.



## Why systems are important

Homes consist of a complex combination of interdependent systems, comprising for example of walls, roofs, windows, floors and heating components. As an example, the heating system is both dependent on the building envelope to prevent heat losses, and on the behaviour of the inhabitants regulating desired room temperature and ventilation. This interrelationship between the systems, the building and occupiers affects the performance of any one component, and ultimately, of the house. Each system provides a specific performance level for a home and collectively they result in a certain level of comfort, resource use or quality of life.

Beacon recognises that the combination of systems that go into a house directly affect the home's overall performance

during all parts of its lifecycle. Materials in themselves typically do not provide performance until they are used to construct systems. By taking a systems approach, the impact of materials in providing a specific level of performance for the component or the whole house can be evaluated. Overseas experience has demonstrated that energy consumption can be reduced by as much as 50% through the use of a systems engineering approach (Build America, 2007).

## How systems will help Beacon's research

The development of a Systems work stream was identified as being critical for achieving Beacon's goals to see New Zealand lead the way in use of sustainable building materials and technologies such as heating systems. A systems approach will be used to identify, evaluate and develop materials and technologies which have a significant environmental/ sustainability impact on energy efficiency, water use, indoor environmental quality, and waste. The overall goal is to accelerate the uptake of innovative systems and technologies into the building process, thereby improving the sustainability of the housing stock for both new build and retrofit situations.

Builders and contractors, but also material manufacturers, are expected to be the primary end users for the 'systems' developed. Beacon will concentrate on systems for both retrofit and new build with high impact and the potential to be applied to a high percentage of building situations.

An associated benefit of sustainable building materials will be a marked reduction in environmental impacts associated with the manufacturing of important materials used in homes. The development of new code and consenting procedures to accelerate the uptake of innovative systems are expected to impact on all retrofitting (where consents are required) and new build situations from the time that systems are demonstrated and effectively being deployed by builders.

Leading the Systems workstream is Dr Barbara Nebel of Scion. Barbara is the group leader of the Sustainability Frameworks Group at Scion and has 10 years experience in assessing the environmental aspects of building materials using Life Cycle Assessment.



## What's new @ [www.beaconpathway.co.nz](http://www.beaconpathway.co.nz)

### **Guidelines for LCA Practitioners; and The Role of LCA in Decision Making**

Produced as part of Beacon's investment in LCA education in New Zealand, these two reports are designed to inform decision makers from industry and government agencies on the potential role LCA could play in New Zealand.

Life cycle assessment (LCA) is increasingly accepted as a tool to analyse the environmental impacts related to building materials and buildings. However, when using LCA data and results, it is important to understand the scope and purpose of the studies. *TE201A Guidelines for LCA Practitioners* offers users a series of questions to help assess the quality of an LCA study and whether it is ISO compliant.

By quantifying the potential environmental impacts of processes and systems, LCA data can be used effectively to assist in decision making situations.

*TE201B The Role of LCA in Decision Making* discusses how LCA data is "operationalised", i.e. product declarations, rating tools and labelling. The paper concludes with recommendations about using LCA more effectively in the built environment in New Zealand.

Find this report at:

[www.beaconpathway.co.nz/systems+and+materials.aspx?PageContentID=1154](http://www.beaconpathway.co.nz/systems+and+materials.aspx?PageContentID=1154)

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### **Making Policy and Regulations Rain Tank Friendly**

This report outlines the findings from an investigation, undertaken in conjunction with Watercare, into the legislation and policy relating to water conservation measures in the home. In particular it considers the ways in which the inclusion of rain tanks in new residential developments can be required as a mandatory measure.

Find this report at:

[www.beaconpathway.co.nz/water.aspx?PageContentID=1159](http://www.beaconpathway.co.nz/water.aspx?PageContentID=1159)

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### **Qualitative Consumer Survey: perceptions of "sustainability" and uptake of sustainable solutions by householders**

### **Quantitative Consumer Survey: household uptake of sustainable solutions**

These two reports (MT102 and MT103) summarise the findings of two consumer surveys, one a questionnaire to Consumers' Institute members, the other an in-depth interview with a smaller group of homeowners.

The reports found that most people only have an awareness of basic sustainability concepts for housing. Currently many householders are unaware whether their homes contain sustainable features or not. These features need to be identified and promoted. Sustainability may have little practical appeal to homeowners. This issue needs to be more clearly understood and, if this is indeed the case, addressed.

People make changes to their home because they perceive problems with the home, are upgrading to increase its value, for home maintenance, or to meet a change in lifestyle. Homeowners need to be persuaded that sustainability features are a good investment and that their benefits outweigh their costs. Sustainability features need to be linked more closely to renovations and home upgrades so that householders understand the options and benefits.

Find these reports at:

[www.beaconpathway.co.nz/Default.aspx?PageContentID=1156&tabid=730](http://www.beaconpathway.co.nz/Default.aspx?PageContentID=1156&tabid=730)

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### **Local Council Sustainable Building Barriers and Incentives: Case studies**

This report looks at the district plans and codes of practice for three local authorities (Christchurch City, Kapiti Coast District and Hamilton City) and identifies common barriers to the incorporation of sustainable building features into residential developments. The analysis also highlights current provisions that encourage the implementation of sustainable features, and discusses how such incentives could be further developed.

Find these reports at:

[www.beaconpathway.co.nz/local+government+research.aspx](http://www.beaconpathway.co.nz/local+government+research.aspx)

## Introducing Sara Peary, Beacon's new Strategy and Relationship Manager

Sara has a BA in Communications and Advertising and a Masters of International Business. Her Masters Thesis covered an Analysis of International Emissions Trading and Implications for Business Strategy. One of her early jobs was Marketing Manager for Miller Law Firm, one of California's leading construction defect litigation companies.

She has also worked as a contractor for the National Centre for Research on Europe in developing strategic business plans and obtaining European Union Grant Funding for the Centre. Most recently Sara took a contract role with Davis Partners, a medium sized commercial property development and property management organisation.



Born and educated in California, Sara met her partner, now husband, in the States. As he is from New Zealand, they decided to relocate to New Zealand and have recently bought a house here.

### Sara's role

Beacon recognises that, to achieve our goals, we need to work close with our partners in the four channels (consumer, industry, infrastructure and government). We need to deliver the results of our research to stakeholders in the most useful and most effective way.

Over the past three years, Beacon's General Manager, Nick Collins, has taken responsibility for engaging with Beacon's stakeholders. Now, with two major market transformation projects underway, Sara will join him in identifying the needs of the different stakeholders in the residential building value chain, and in developing the material which will meet those needs.

## The last Open Day for the Waitakere NOW Home®

The end is near for Beacon's first live research project, the Waitakere NOW Home®. And we're celebrating with our last public Open Day, with tours as part of the Waitakere EcoDay.

**What:** Half hourly tours of the Waitakere NOW Home®

**Where:** 1 Olympic Place, New Lynn, Waitakere City

**When:** Sunday 9 March, 10am – 4pm

After two and a half years of gathering data on how well the house has performed while it was tenanted, the house is being sold to Ecomatters Environment Trust to be used as offices.

Our happy tenants have moved on to buy their own home, and they tell us that their NOW Home® experience has made them very fussy. Their new home is north facing, fully insulated and well laid out.

"We even had the house moisture-checked before purchase," says Hayley. There was no way this family was going back to the constant requirement to run dehumidifiers which was their pre-NOW Home® experience.

### Still to come

How well did the Waitakere NOW Home® perform in its second year?

Although the house will be sold, the monitoring data for the final year is still being analysed. We're expecting to be able to tell you more soon.

As one of the most intensively monitored homes in New Zealand, the Waitakere NOW Home® project has been a steep learning curve for everyone involved. This learning is being applied to the NOW 100 project which extends the first two NOW Homes® into 100 houses around New Zealand.