

# Facing

Newsletter of Beacon Pathway

December 07



Wishing you a  
Merry Christmas  
from the Beacon  
team



## National Value Case for Sustainable Housing Innovations

New Zealand homes are cold, damp, unhealthy and inefficient. They contribute to poor health, increase our environmental impacts, and take money out of our pockets. However these problems can be fixed with a relatively simple set of changes to our homes that the Government needs to drive. This is Beacon's message to Government in our latest report *National Value Case for Sustainable Housing Innovations*.

A Beacon-commissioned review of indoor environment quality research in New Zealand shows New Zealand homes are, on average, 6°C colder than the World Health Organization's recommended indoor temperature. 45% of all New Zealand homes are mouldy, 300,000 New Zealand homes have an unflued gas heater (banned overseas), and the air inside New Zealand homes can be more polluted than outdoor air. Cold damp homes pose serious health risks: New Zealand has the second highest rate of asthma in the world and an excess winter mortality rate of 1600 not seen in other OECD countries.

The inefficient use of energy and water in New Zealand homes imposes high costs on households and increases carbon emissions. The health impacts also pose a significant healthcare cost to taxpayers.

Beacon argues that there is a strong value case at a national level to improve New Zealand's housing stock to a high standard of sustainability with beneficial social, health, environmental and economic outcomes. The *National Value Case* report takes six simple energy and water saving innovations and demonstrates the potential benefits and costs of nation-wide intervention.

Combining the five innovations that were rated as Medium Weak or better, and spreading installation costs over 20 years, would generate a direct private economic gain to households equivalent to one percent of GDP by 2017 or about \$2 billion. 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. Most of the energy savings are in electricity use, implying a reduction in CO<sub>2</sub> emissions of 3600kt per year, the equivalent of \$54 million in tradable emissions (at \$15/tonne). Even allowing for take-back effects in the form of warmer and healthier homes and spending of household savings from energy on travel and other commodities, net economy-wide CO<sub>2</sub> savings of 1600kt are still produced. Direct water savings amount to 81 litres per person per day, or about 130 million m<sup>3</sup> per year.

Beacon sees the *National Value Case* as a wake up call on the health and environmental effects of the houses we live in, and the costs to families and the nation. While the report backs recent research showing that people on low incomes suffer most as they tend to live in the poorest housing, more affluent households tend to use more water, and more energy to heat inefficiently designed homes, creating significant environmental impacts.

Beacon believes Government is a key player to drive the necessary changes, both as a regulator, funder and landlord. Current Government initiatives, while a good start, are not sufficient to address the problem effectively. In particular, Beacon recommends focusing on the sustainability of the whole house, combining interventions to make the most difference to health and the environment.

You can download the *National Value Case for Sustainable Housing Innovations* from [www.beaconpathway.co.nz](http://www.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

## Encouraging rainwater tanks

Urban regions worldwide are struggling to meet growing demands for infrastructure services, including water management. Auckland is no exception. With the city's population growing, it is no surprise that demand for water is only going to increase. Moreover, inner city housing intensification means that the existing infrastructure simply can't cope. Pipes that once serviced one dwelling now service many. Wastewater and stormwater outputs are increasing while the reticulated pipes remain the same size. The result is overflow and flooding during heavy downpours, and the need for expensive upgrades.

On-site water supply can augment a reticulated supply through harvesting of water in rain tanks or recycling water after use in showers and laundries. Using tank water for non-potable uses such as toilets and laundries, can save up to 45% of household demand, and the Waitakere NOW Home®, with a large rainwater tank, uses 66% less potable water than the average in the Auckland region.

In conjunction with Watercare Services Limited, the bulk supplier of water and wastewater services within the Auckland region, Beacon's water researchers have explored how best to make rainwater tanks mandatory in all new residential buildings across the Auckland region.

Their report ***Making Policy and Regulations Rain Tank Friendly*** explores the current situation and relevant



legislation, regulations and policy at all levels. It identifies the optimum process across the Auckland region to remove impediments and amend policy, legislation and regulations to provide for rain tanks mandatory provision.

You can download this report on [www.beaconpathway.co.nz/research+reports+to+ju+ne+2007.aspx](http://www.beaconpathway.co.nz/research+reports+to+ju+ne+2007.aspx)

## Energy rating schemes

New Zealanders are starting to realise that they don't *have* to live in cold, damp houses; houses that are uncomfortable, expensive to run and downright unhealthy. People want better. A house that performs well is warm, dry and healthy, without costing a fortune. It is well insulated, effectively heated, uses less costly resources (including water) and meets basic safety requirements. Research shows that residents in such homes are sick less often, have fewer days off work and school, have lower doctors' bills, and are more productive.

The car industry is heavily regulated. Everyone who legally drives a car on the road needs a driver's licence and a Warrant of Fitness. Imported used vehicles now have to meet stricter standards for exhaust emissions. Yet research suggests we kill hundreds more people a year in cold, damp houses than we ever do in our motorcars

Older homes, which make up the majority of our housing stock, don't have to comply with any safety or performance criteria. There are no minimum performance requirements for energy or water efficiency. There is no requirement that homes meet the standards of the current Building Code.

The tools to evaluate the energy performance of a house will soon be available. In December, the Energy Efficiency and Conservation Authority (EECA) will launch its Home Energy Rating Scheme (HERS) to provide an independent means to measure and rate a home's energy efficiency.

Home energy ratings will be applied to homes in a similar way to the star rating for appliances. HERS will protect renters or homebuyers who will have an accurate measure of the energy performance to identify those with a higher level of energy efficiency. It will enhance the value of homes which have healthy, resource-efficient solutions.

Beacon welcomes the Home Energy Rating Scheme but we believe a voluntary scheme is not enough. Indeed, although mandatory energy rating is a start, Beacon believes there is a need for sustainability rating tools which address whole house sustainability. Water supply is likely to become as big an issue as energy, and uses substantial energy in its treatment, reticulation and heating. Homes need to be heated to comfort levels and the quality of the indoor environment has a major impact on health as well as energy use.

## Barriers to sustainable building in council district plans

District plans and codes of practice significantly influence residential development and although unique to a local area, aspects relating to residential buildings and their location within the urban residential built environment are often similar.

The issue of sustainable buildings is one that district plans are only just beginning to grapple with. The focus of district planning has been on the spatial issues associated with city development, and within this context, the relationships and effects between different activities, rather than the quality and sustainability of the “internal environment” involved in different activities and buildings.

Beacon’s report *District Plan Barriers and Incentives to Sustainable Residential Building – Case Studies* identifies common barriers and incentives to sustainable building design and development within district plans of four territorial authorities: Auckland City Council, Kapiti Coast District Council, Hamilton City Council, and Christchurch City Council.

Key barriers were found to be:

- Traditional development controls with no exemption or allowance for features such as rain water tanks, solar panels or small-scale energy generation.
- Solar orientation is often constrained by yard and height-in-relation-to-boundary rules and there is no requirement to orientate buildings on lots for sunlight.
- Low impact approaches to stormwater management are restricted to areas of particular environmental sensitivity, or where there are infrastructure constraints.
- The costs, uncertainty and delays of getting consent for discretionary and non-complying activity consents generally deterring people from incorporating sustainable features.

Suggestions to address these barriers include:

- Objectives, policies and assessment criteria that recognise the wider positive benefits of sustainability.

- Allowance within standards for features like rain tanks, but also providing exemptions where sustainable features are included.
- Non-regulatory methods such as guidelines or information that assists in designing sustainably.
- Development controls that require sustainability features, such as requiring appropriate building orientation for solar gain and natural ventilation.

## Snippets

### EECA Energywise Awards

The Waitakere NOW Home® was Highly Commended in the Fujitsu General NZ Ltd Residential Category at EECA’s Energywise Awards. The category was won by the reality TV series, Wa\$ted.

### Beacon’s new office

Our new offices are at:

Upper level, 109 Great South Rd  
Greenlane  
Auckland

The offices are located on a major bus route and within 5 minutes walk of the train station.

### New people

Beacon has engaged two new Research Team Leaders, a reflection on the busy programme underway and a new emphasis on seeing the house as a system.

We are splitting our Homes research stream into two: new and existing. **Andries Popping** of Apsoltec Ltd will take responsibility for the Sustainable New Homes leading the flagship programme of NOW 100 for Beacon. Andries was a key member of the Rotorua NOW Home® project group during construction.

Leading the Systems and Materials research is **Dr Barbara Nebel** of Scion. Barbara’s earlier work for Beacon was in the area of Life Cycle Assessment.