

Better performing homes for New Zealanders:



Making it Happen

DEDICATED TO MAKING A DIFFERENCE



New Zealand Business Council
for Sustainable Development



...the key to success is to update our existing homes...

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We can all win from improving the performance of our existing homes



Nick Main
Chair

**New Zealand Business
Council for Sustainable
Development**

November, 2008

Housing is a fundamental component of our quality of life. The majority of our homes perform poorly. They are cold, damp and difficult to heat. It is a paradox that our existing homes could use less energy and water and be much more comfortable than they are now. Many poorly performing homes contribute to the health issues of their occupants. Once home temperatures get to 18°C there is a dramatic improvement in health.

Up to 85% of the total energy consumption and CO₂ emissions of a building comes from consequent heating, cooling, ventilation and hot water use. Reducing this dramatically offers a significant opportunity to help New Zealand meet its energy efficiency and emissions reduction targets while maintaining economic growth.

Improvement has already started in the commercial sector with the development of Green Star rated buildings. Green Star was developed by the private sector, was backed by Government through its purchasing policy for new buildings and has been picked up by developers first for new buildings and subsequently when retrofitting office spaces. New Zealand however appears to be lagging international experience in improving the performance of its existing housing stock.

There has been significant recent interest in improving the performance of new homes. Proposed changes to the Building Code mean new homes will use up to 30% less energy than existing homes. Bigger water and energy savings are being achieved by designers and developers building 'eco-friendly' homes beyond the Code. Right House, Warren and Mahoney, ebode, Lockwood and Stonewood Homes are all active in this area.

The biggest challenge is how best to address the large number of existing homes which can, with retrofitting and renovation, perform better. While we build more than 20,000 new homes each year, we have more than one million existing homes whose performance could be significantly improved. Our existing homes can be more comfortable, warmer in winter, cooler in summer and healthier while using less energy and water.

In May 2007, the New Zealand Business Council for Sustainable Development commissioned a collaborative research project working with 19 businesses and organisations in the building sector and consulting with a further seven organisations with an interest in delivering sustainable buildings.

We soon decided the greatest potential for improvement was in upgrading our existing housing stock.





*"The outcome is a five point solution to improve the places where we live.
The solutions are all achievable but we need to start today."*

The outcome is a five point solution to improve the houses in which we live. The solutions are all achievable but we need to start today.

First and foremost we need a clear over-arching strategy between industry, local and central government enabling us to achieve substantial gains in the performance of the housing stock. We need to clearly detail what we want to achieve in the built environment and how we are going to get there.

We need to work with owners and occupiers to understand their aspirations for better performing homes, and we need to communicate this to the building sector.

The products and services needed to effect change in the existing housing stock are already known to us, but all the parties in the chain from manufacturer to retailer to builder need to collaborate to deliver solutions which best meet owners' and occupiers' aspirations.

Underpinning success a mandatory performance rating system which will effectively provide sustainability certification of homes is proposed. This will offer owners and occupiers a market valuation reward for the cost of the 'hidden' retrofit features, like insulation, which make a home perform better.

But none of this will happen if we don't introduce a fast track in our regulatory processes. The current "red tape" delays and sometimes even prevents, homeowners, their builders and their installers from retrofitting their homes to achieve better performance. We need "green tape" empowering people to 'do the right thing' without extra cost and delays.

This report outlines a five point solution and key responsibilities. While the solutions have costs we all stand to benefit from lower health bills linked to better housing. These are estimated at \$54 million and, in addition, more than \$17 million in extra production can be captured, energy and water use will fall, more people will be available for work and thousands fewer will have to go to hospital each year. Previous work found for every \$1 you invested in insulation, health and other benefits worth \$2 can be captured. We must make the investment now.

A shared view between homeowners, the Government and the building industry is needed to realise on the potential. The Business Council wants this report to be the catalyst for that change.

Current state of our homes and the issues it raises

The average New Zealand house is “scarily cold”, badly insulated, has huge expanses of single-glazed glass, and is a nightmare to heat. In terms of energy efficient homes we are not very far along. It’s pretty much where the Scandinavians were in the 1960s.”

Prof Robert Vale, Victoria University



The issues in context

New homes are starting to improve

We may be decades behind other countries in terms of demanding better performing homes, but we’re beginning to see much better performing new homes built. Improved performance means homes that are more comfortable and warmer while using energy and water more efficiently.

20,000 new homes are built each year in New Zealand, 44% of these by group house builders and developers who are increasingly open to including resource efficient features. In 2006, 67% of new homeowners had some or substantial input into the design of their house.

However, the drive to improve the performance of new homes has been largely focused on the architecturally designed, higher priced homes, or alternatively the Housing New Zealand Corporation housing stock which is being addressed by the Government to influence access to affordable homes. There has been limited investment in modernising state housing which represent 4% of the total housing estate. Having been accumulated over many years, it has an average age in excess of 35 years and there is some evidence that maintenance spending has been too low to keep pace with wear and tear.

There has been a real gap in the median priced homes segment which represent the bulk of the market. Companies such as Right House, ebode, Stonewood Homes and Lockwood are addressing this area.

But our existing homes are underperforming and often unhealthy

A huge number of the 1.6 million existing homes perform poorly in terms of energy and water use, warmth, comfort and indoor environment quality. Every year 80,000 renovations occur but we tend to invest in improving appearance not performance. Traditionally we build to the minimum specifications in the Building Code so when undertaking renovations requiring building consents, people are not encouraged and may even be frustrated in their attempts to improve the performance of their homes above these minimums.

While there has been a buoyant new home construction industry over past years with many New Zealanders buying and selling houses regularly to enjoy short-term house price increases, the market is changing. In the current economic situation energy costs are going up and house prices have been falling. This may see homeowners, particularly in the middle to high end bracket, staying in their homes for longer and investing in improvements to reduce operational costs and to increase the value longer term.

Consumers know what they want in terms of look, comfort, lifestyle and performance but need help to achieve it

53% of homeowners renovate their home within two years of purchase and very often become the renovation project manager, usually in the role for the first time.

But it can be extremely difficult for home owners and renovators to find the best solutions for their homes in terms of low maintenance and resilience, energy and water efficiency which also deliver their aspirations for comfort, lifestyle and modern look. The building industry, in the form of the individual builder or single product installer, is often unaware of how to package their and others' products to meet these aspirations.

By the time the home is completed 80-90% of its life cycle economic and environmental costs will be decided. It is therefore much more expensive and disruptive to renovate a home to make it perform better after it has been built.

While there are increased costs and disruption, existing homes can be successfully retrofitted so they perform better.

Having decided to buy Earth-friendly items, many consumers encounter a final hurdle: they can't find them... The reason consumers cannot find these products is that businesses are not stocking them.

*Stanford Social Innovation Review
Fall, 2008*

It's about quality of life, consumers seek comfort, look and lifestyle much more than cost savings

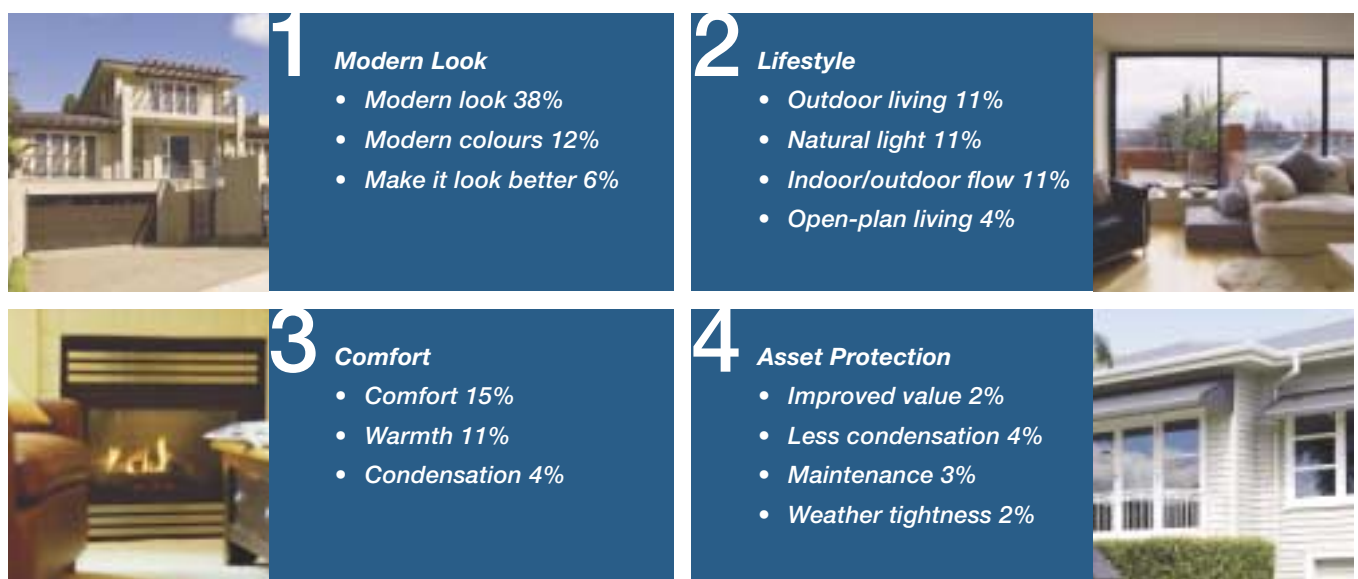


Figure 1: Consumer reasons for renovating Source: Traffic New Zealand

It is much cheaper and less disruptive to include solutions which help a home perform better right at the start than add them later.

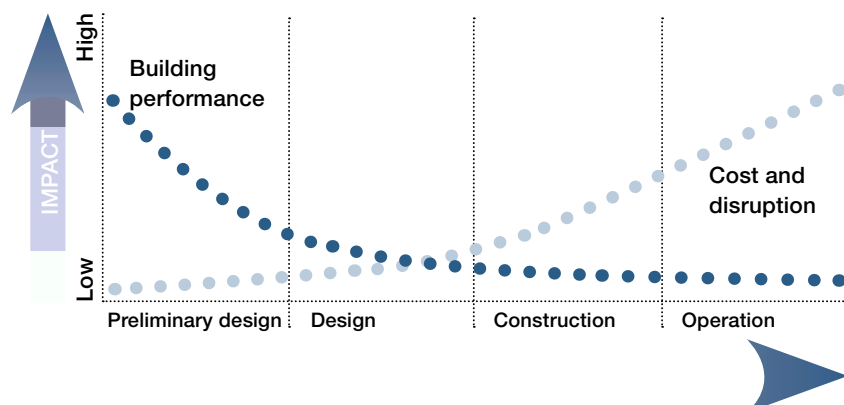


Figure 2: The benefits of early integration Source: WBCSD

The industry is risk averse to new building systems

Well established group house builders have, in general, developed new home offers with the benefits of better performing homes. A similar trend in the home retrofit and renovation space is yet to emerge. Following the leaky buildings problem, much of industry is risk averse to introducing new building systems. The building construction industry is very sensitive to delay. It has difficulty in controlling costs arising from uncertainties: approval process delays for “new” or “different” products, building compliance requirements, or changed requirements relating to installation of “new” building products and systems. In this highly regulated environment, it is often easier to build the way we always have rather than raise the bar.

The building industry is based around selling and installing products not solutions with measurable performance benefits

A home can be warmed with a pot-bellied stove, or electric or gas heating, or by adding insulation, double glazing or a heat pump. The building industry will usually be selling individuals just one of these products, rather than the best combination for the house. While there are exceptions emerging, in general terms, operators don’t understand what the market wants and how solutions (the combined effect of several products) can be structured to achieve measurable performance benefits.

So we see off-the-shelf individual products that builders are sometimes poorly equipped to install, require consents that limit how easily and quickly a homeowner can get a product installed, and do not in and of themselves provide the overall better performance solution sought by the home owner.

Despite the building sector being characterised by a high level of market activity – over 20,000 new homes and about 80,000 renovations occurring annually, most building businesses are small scale. They have a single product focus and lack the capital to invest in the market research and alternative business models required to sell solutions rather than products.

Significant volume of renovation work is carried out by large numbers of small scale businesses.

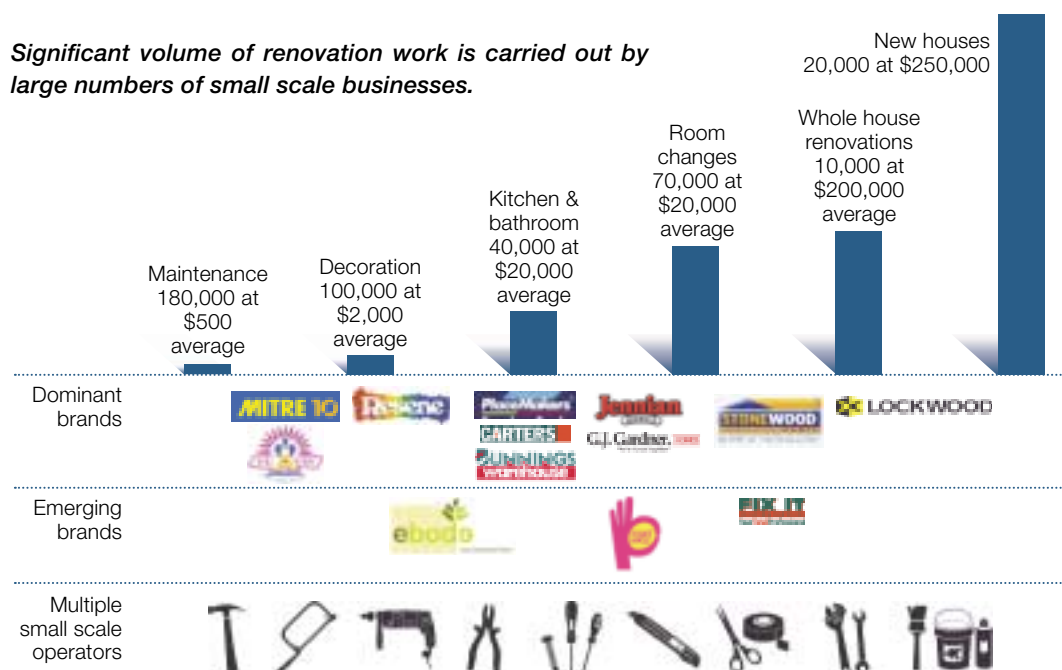


Figure 3: Market activity Source: Traffic New Zealand



Even when consumers know what they want, and the products exist and builders can deliver it, the regulatory framework often provides a road block

With 85 Territorial Authorities (District, City and Regional Councils), achieving consistency and alignment of delivery of building outcomes is difficult.

The regulatory framework for better performing homes exists within current legislation, policies and plans at central, regional and local government levels. Most people only engage with this framework through local government. Councils influence, encourage or actively prevent sustainable building through their established policies, rules and processes. These can structure which building choices are “easy” to consent and which are more difficult. Sustainable building features above or beyond the Building Code are generally in the “more difficult” side which actively discourages consumers and builders from making these choices. The time and cost of delays associated with consent rule requirements and needing to prove that more sustainable solutions are compliant with Council rules are both anecdotally and evidentially reported.

We’re focused on meeting improved minimum standards rather than enabling people to get ahead of them

The Government has been working to ensure that new housing has better performance through changes to the Building Code, such as improved insulation requirements (including double glazing in most climates). These changes will mean new homes use about 30% less energy, produce fewer

Finding a way through the maze of legislative requirements takes time and money. Renovators facing resistance from their builders and council often just give up.

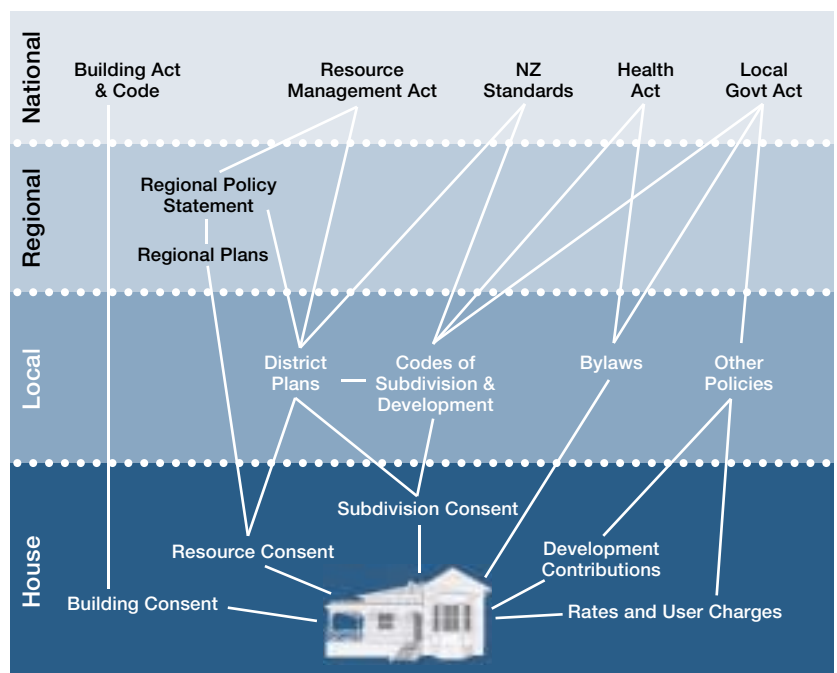


Figure 4 The national and local legislative framework

Source: Beacon Pathway

emissions and help provide energy capacity for future population growth. These changes can be fully justified on cost savings but for homeowners who are seeking better performing homes, cost savings are not the major driver.

Homeowners get frustrated when they look to improve the performance of their existing homes by introducing features which are ahead of the Building Code, such as grey water systems, triple glazing, or wind turbines.



Home ownership trends

Economic Drivers

New Zealand's traditional home ownership ethic may be changing, demonstrated by a decrease in the ownership rate from 73.8% in 1991 to 66.9% in 2006. For years New Zealanders have bought houses as part of their investment portfolio and consequently we now have more landlords than ever before. Tenants have little incentive to improve the performance of homes they live in, other than by moving, because the benefits of any upgrade they fund will mainly go to the landlord or to subsequent tenants. Landlords get limited benefit from improving the performance of their rental homes because the cost savings normally go to the tenant and any improvement in performance currently has no impact on the value of the home or their rental income. Recently introduced grants to landlords to address this issue have had limited take up.

Home improvements cost too much

Improving the standard and efficiency of buildings typically reduces the on going costs but also increases the initial cost. The builder faces the

challenge of balancing increased up front costs and specifications to improve home performance. House owners are generally resistant to sustainable and energy efficient products and systems as they think they "add significant cost" and are, "too hard to justify". ShapeNZ research finds, most respondents think a home with improved performance would cost at least 20% more than a standard home to build. The true cost has been demonstrated to be about 5–10%.

This impression of higher initial cost is certainly supported in the case of solar hot water where the payback period for a replacement system, including the cylinder, is between 15.4 and 18.2 years. Recent energy cost increases may be reducing that payback period and solar heating systems are becoming more cost effective.

Concerns over affordability: higher initial capital costs need to be funded

Individual households, when faced with insufficient income, are likely to trade off housing costs against housing adequacy. For example,

by moving into housing that is overcrowded, or substandard but located closer to work.

This trade-off also affects building companies targeting the affordable housing sector. The key impediment to the use of life cycle costing in affordable homes is that, typically, the purchasers face a significant challenge crossing the up-front cost barrier, even if the ongoing cost savings can more than offset their initial cost. Consequently, the developer faces the challenge of not wanting to increase costs while providing a reasonable product. Using better quality products to reduce ongoing costs may make their home offering less competitive because of the higher initial cost.

Increasing initial costs has a significant impact on the ability of households at the margin to access affordable housing unless the initial costs are some way subsidised or payments spread into the future.

Together with targeted home loans available to lower income households, the Government has set up a two-year \$35 million shared equity pilot enabling up to 700 households to be able to afford to get into the housing market in the highest regional house price markets.

While the increased initial costs for better performing homes impacts affordability, there are examples demonstrating that affordability and better home performance are both achievable (see the NOW home case study p16).

Home ownership accounts for 70% of households' total assets

In New Zealand the value of owned housing accounts for more than 70% of total household wealth, compared with the rest of the OECD average of less than 50%. Notably, while we have energy ratings for cars – for many people their second most valuable asset – we do not have any similar way of knowing how much energy our most valuable asset – our home – will use.

While our cars get an annual Warrant of Fitness, we do not have to maintain our homes in the same way.

Real estate agents, finance companies and consumers expect little benefit in the price of a house from improved home performance

Real estate agents generally know little about the ongoing performance of buildings. The finance sector has been relatively slow to provide opportunities for homeowners to retrofit to agreed higher performance outcomes and/or purchase new homes with additional “sustainable” features beyond minimum Building Code compliance. Westpac does offer a ‘green home loan’ with voucher discounts for homeowners for solar hot

water heaters, insulation, energy and water efficient appliances. NZI has insurance products that encourage sustainability in homes, contributing \$10,000 –\$20,000 to add sustainable features.

When buying and selling, consumers do not associate more sustainable homes with greater value. While there are likely to be savings in electricity, water and health costs for consumers who improve the performance of their homes, they have little way of measuring the value of this differentiation between homes with similar appearance but vastly different performance.

In the absence of any house price increase for better performance, few real estate agents would recommend, for instance, upgrading a home's insulation.

There is no widely recognised rating system certifying that a home is code compliant, comfortable and performing well in energy, water and ongoing maintenance costs.



The environmental and social returns of better performing homes have been proven in new homes in New Zealand

Climate change's effects and impacts on buildings are becoming more apparent

BRANZ has identified climate change impacts for New Zealand homes including:

- **Emissions** – reducing greenhouse gas (GHG) emissions of houses
- **Mould** – summer overheating and increased mould growth increasing health problems
- **Wear and tear** – increasing driving rain, severe winds will impact house facades and penetrate interiors
- **Drainage** – drainage systems may not be able to cope with more intense rainfall
- **Water resources** – expected reduction in summer rainfall will impact urban water supply
- **Winter heating** – potential changes in space heating requirement
- **Air-conditioning** – higher temperatures inside houses will increase the air-conditioning load

NZ homes are not energy efficient

Energy usage for heating is directly related to insulation levels. 1.04 million homes (65% of current housing stock) were built before insulation was required. Many of these homes have been upgraded but many still lack sufficient insulation. Many more homes built after insulation was required after this time do not meet current insulation requirements. Research indicates that about 375,000 New Zealand homes have inadequate ceiling insulation and over one million have inadequate underfloor insulation.

Space conditioning provides comfortable indoor temperatures at times when the house would otherwise be too cold or too hot. Most space conditioning in New Zealand involves supplementary heating in winter but there is an increasing demand for summer cooling.

Hot water system stand-by losses represent 25–30% of total hot water energy use in electric cylinder systems. While A grade cylinders became mandatory in new homes in 2000, it is estimated that only 5% of installed hot water cylinders meet A grade specifications, and about 35% of houses have old (ungraded) cylinders or C grade cylinders that waste energy.

Nearly two thirds of homes (65%) were built before insulation was required

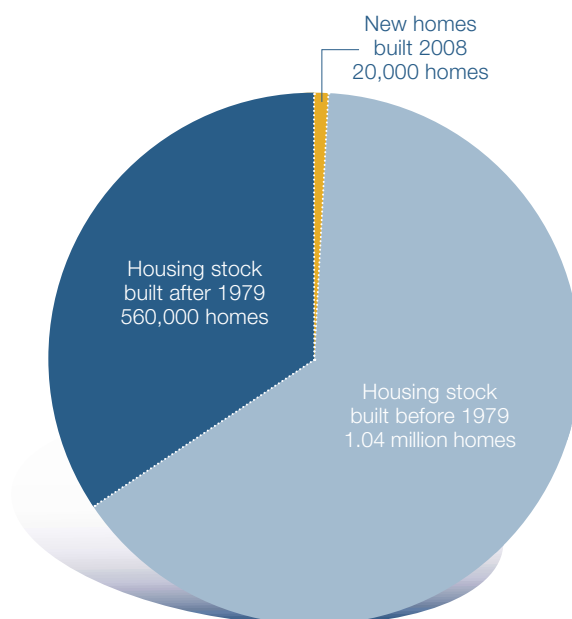


Figure 5: Age of housing stock at a glance

Typically over one third (35%) of energy used in a household is for keeping warm.

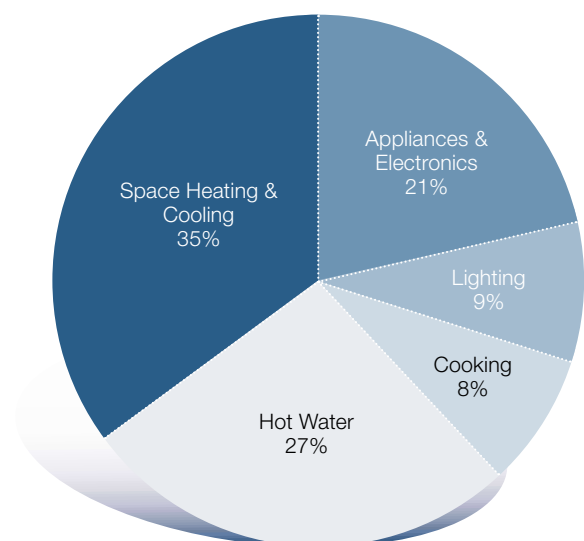


Figure 6: The impact of housing energy efficiency on the market, 2006.

Source: Centre for Housing Research Aotearoa New Zealand



Significant benefits – houses are the world's largest consumer of energy with 25% global end use demand

The Inter-Government Panel on Climate Change (IPCC) Fourth Assessment report recognised that buildings represent the best opportunity to make significant reductions in GHG emissions while maintaining economic growth. The IPCC estimates that by 2022 CO₂ emissions from building energy use can be reduced by 29% at no net cost.

Internationally, governments are establishing policy to capture this opportunity. The UK Government for instance, has already set out its policy that new homes will be zero carbon from 2016 as a significant contribution to their goal of reducing overall carbon emissions by 60% by 2050.

Social factors

Urban growth will require community level planning. By 2050 the Auckland region could be home to between 1.6–2.2 million people. Christchurch is currently preparing for an increased population the size of Gisborne in the central city area by 2026.

New Zealanders need access to a diverse range of housing choices. Future population growth will increase the demand for housing. Future needs are likely to include a mix of housing styles in areas with easy access to work, services and community facilities.

Our homes can be a health hazard

Indoor pollutants contributing to poor quality housing include volatile organic compounds (VOCs), unvented gas appliances and second-hand tobacco smoke. Older uninsulated housing is often damp, cold and mouldy, which contributes to poor health, particularly for people in lower socio-economic groups. Newer housing may cause its own problems: often being airtight with little ventilation potentially creating damp conditions associated with toxic fungi.

We have an increasing number of older people in homes which are cold, damp and expensive to run

The number of people aged over 60 in New Zealand was 15.4% in 1996 and will increase to 25% of the New Zealand population by 2030 from 15.4% in 1996. The proportion aged over 80 will also increase. Good quality housing is an important determinant of health in older people. Many older homeowners are dependent on Government pensions for day-to-day living expenses, leaving little to pay for home repairs and modifications. Houses need to be secure, warm, affordable, low maintenance and close to local amenities. The Government providing funding for upgrades, possibly secured against the estate of the elderly person, may provide the means to ensure no pensioner lives in a cold home.



It's a BIG problem

The number of existing homes – 1.6 million – presents our biggest challenge and opportunity. We have one million homes that are poorly performing. 45% of existing homes are mouldy. There has been some insulation retrofit in the existing housing stock and only 6% of housing is completely uninsulated; but 64% of houses do not have insulation under their floors; 29% do not have fully insulated ceilings and 71% do not have all walls insulated. Most existing housing would not meet the insulation levels in the new Building Code.

Poorly performing homes have been linked to increased incidence of respiratory illness. This means that each day 780 people are not turning up to work because of health problems caused by their homes. 50 people each day go to hospital because they live in damp; cold homes. Each public hospital bed night costs \$3,000 so we are all paying for our poorly performing homes.

More than 1 in 4 New Zealanders say the home they live in has contributed to their sickness. (ShapeNZ Survey)

But can we fix it? Yes we can

A basic upgrade for existing houses does improve a home's performance significantly for the owner or tenant

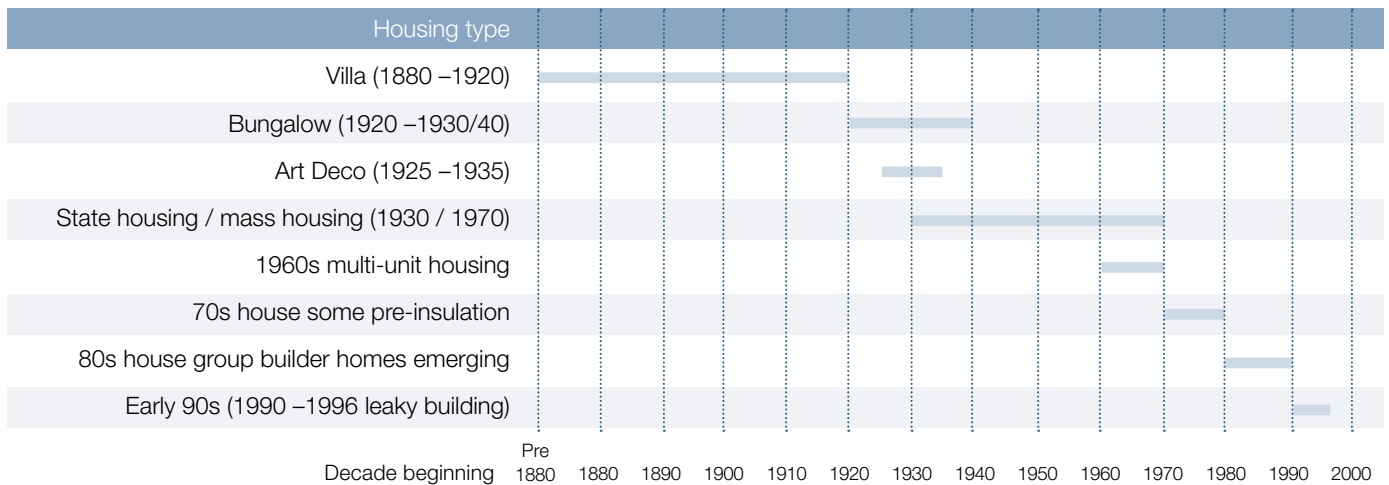
Clear evidence exists that upgrading the performance of the existing housing stock can provide substantial benefits for New Zealanders. While the products to deliver better performing homes are available, the renovator market is small scale, is highly fragmented and usually focused on providing a single product.

Home renovators are not usually being presented with targeted solutions matched to their house and needs. Clearly there is not a 'one solution fits all' as our existing housing stock has a wide range of housing styles and types. The current condition of the housing stock from a maintenance perspective suggests there is opportunity for capturing performance retrofit opportunities at the same time as necessary maintenance is undertaken. Initial work in mapping housing type with the optimum mix of retrofit options for best performance improvement has begun.





We need optimum retrofit packages for each housing type



Priority for developing housing retrofit packages need to be for 1950–1990 houses

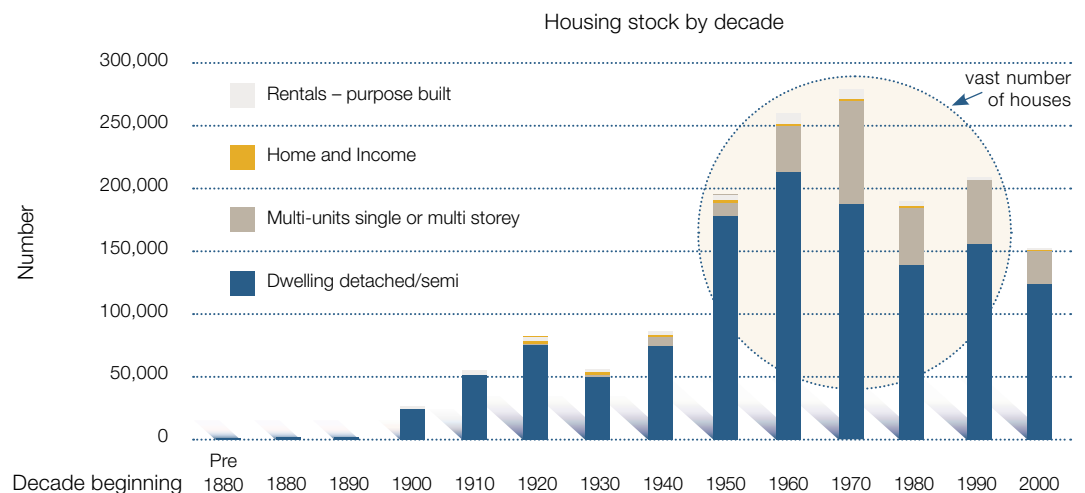
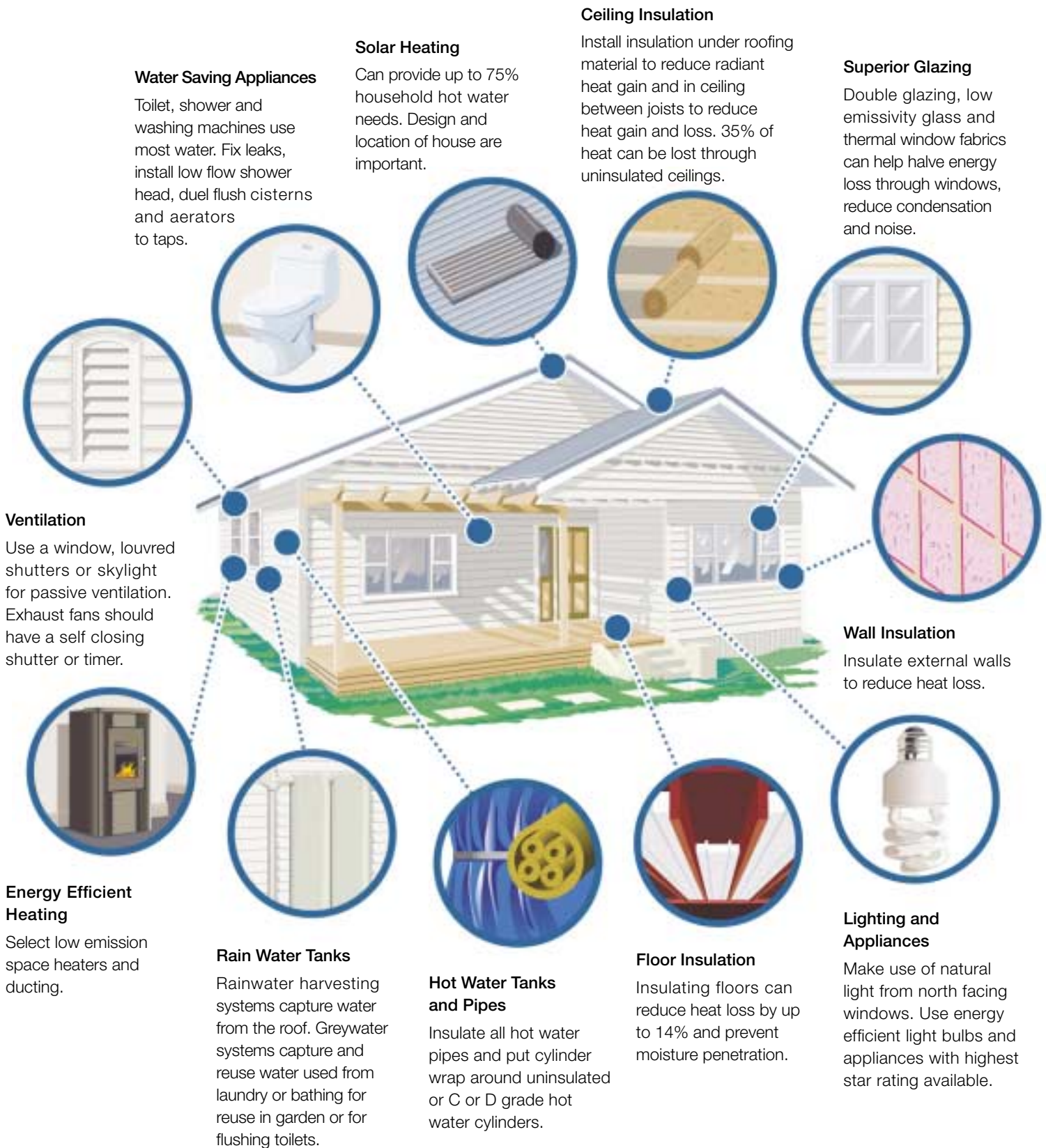


Figure 7: Housing stock by age Source: BRANZ Study Report No. 142 (2005) New Zealand 2005 House Condition Survey

We do know key elements of these packages: Retrofitted insulation (walls, ceiling and underfloor) and double glazing appear the most effective in

improving the warmth and comfort of existing, as well as new homes, while delivering the most health benefits on a national scale.

We KNOW what works: The upgrade elements for existing houses





*"it's warmer,
drier, more
affordable and
more comfortable
than any house
we've lived in.
NOW home occupants*

We CAN do it

Early demonstration homes show we CAN build and retrofit our homes in such a way that building performance is improved .

Case Study: We CAN build high performing new homes

The Waitakere NOW home is a single storey, three bedroom home of 146 m² (including garage) and built at a cost of \$213,853 +GST, excluding landscaping and soft furnishings.

The performance of the Waitakere NOW home – Results from the first year

Water efficiency	40% saving compared to the average in Waitakere City – and more than 66% saving compared to average use in the Auckland region. The key factor is the rainwater tank, but the low flow, dual flush toilet is also delivering excellent water efficiency.
Water heating	The solar hot water system provides for 55% of the tenant's water heating needs -equivalent to a saving of 1620 kWh (compared to similar houses in the area) or about \$275 on water heating alone. Water heating typically accounts for 28% of household energy use.
Space heating	The tenants used a space heater on only a couple of days. The winter mean temperatures for living rooms and bedrooms 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.
Overall energy savings	Used 7400 kWh per year or 33% less than an average four-person household with school age children. For comparison, this is 45% less than the tenants' energy use in the house they occupied prior to moving.
Humidity	For most of the time in both summer and winter, internal humidity has been within the acceptable range for human health (25-75%), while humidity levels in Auckland frequently exceed 75%.
Enjoyment of the home	The tenants appreciate the layout of the rooms, the openness, absence of hallways, and clever use of spaces. This may seem surprising as the 'footprint' of the home is relatively small. They love the concrete floor because it's easy to clean and keeps the home warm and temperatures even. Their children's asthma has also improved.



Case Study: We CAN retrofit existing homes and improve home performance

Beacon Pathway have a project in Papakowhai, Porirua, exploring the options for retrofitting existing houses to their "high standard of sustainability" so they are more energy and water efficient, healthier and affordable.

The 10 houses in the study include single and two storey homes with a range of sizes, materials and designs representing a variety of household types. The homes were renovated over the first half of 2007 and are now being monitored for 12 months to compare before and after performance. Each has had a different combination of features installed, to allow

comparison of the effectiveness of various packages. The aim is to identify renovation options which will be:

- the most cost effective
- easy to implement, applicable to a range of house types and regions
- able to significantly improve how well the homes perform in energy efficiency, water conservation, waste minimisation and indoor environment quality.

The problems at a glance

There is no shared vision on how to sort out our one million underperforming homes

The proposed changes to the Building Code will provide improved minimum benchmarks for home performance for new homes and when existing homes are renovated. The Government and the private building sector don't have a shared view about how consumers aspiration for better performing homes should be realised; how quickly and at what cost this can be achieved and what the benefits will be if we take action.

Homeowners know what they want but need help to achieve it

What many consumers want in a home is much more than just the Building Code minimum or a renovated kitchen or bathroom – it's about modern look, comfort, warmth, feeling good about doing the right thing and getting a better performing home in terms of low maintenance and resilience, energy and water efficiency. Many renovators have difficulty in finding both the products they need and competent installers.

The industry sells individual products not integrated solutions that best deliver better performing homes

The renovator market (and to a lesser extent the new build) is dominated by homeowner project managers often in the role for the first time. The market is very fragmented and serviced by small businesses who often struggle with lack of knowledge, skills and capacity to understand the market potential for developing targeted and integrated solutions for improving home performance. Most renovation providers (builders and installers) are small scale and lack the capital to invest in the market research and different business models or systems required to sell integrated solutions rather than sell and install individual products.

A home can be warmed with a wood burning stove, or electric or gas heating and the operating cost reduced by adding insulation, double glazing or a heat pump. The building industry person individuals deal with will usually be selling or installing just one of these products, rather than the best combination for the house. While there are exceptions emerging in the industry, small scale operators don't understand what the market now wants, and how comprehensive home performance improvement solutions can be better provided to achieve measurable performance benefits.

There's no value payback for improved home performance reflected in a higher house price after renovation

When buying and selling, consumers do not associate better performing homes with greater value. Most buyers do not investigate how the home will perform. Few even check if the house they are buying is insulated. While there are likely to be savings in electricity, water and health costs for owners who improve the performance of their homes, they have little way of measuring the value of this improvement in the selling price.

Real estate agents are unlikely to advise sellers to put in more insulation or double glaze a house because it won't increase its apparent value and provide a quick return on the investment.

There is no rating system widely recognised as certifying that a home is Building Code compliant and performing well, so that it will be warm and comfortable to live in, be healthy and cost less to run and maintain.

Anything out of the ordinary takes too long

Architects, builders and renovators that propose better solutions to deliver improved performance from homes are frustrated by councils who are now risk adverse and delay approvals after their experience with leaky buildings. Perversely trying to create better performing homes and renovations often slows or halts the approvals process.

Time is money in a cash flow sensitive business like building and the prospect of delays creates a highly risk adverse industry which build and renovate to the current code even though many consumers want more.



The Problem:

There is no shared vision on how to sort out our one million underperforming homes

Government is responsible for putting the right framework in place

Central Government influences the residential sector in three ways. As a policy maker, Government's role includes the development of the legislative frameworks (such as the Building Act, the Tenancy Act) and policies that influence the performance of our homes (such as the New Zealand Energy Strategy, the New Zealand Housing Strategy). It establishes the regulatory environment for the housing sector. Homeowners and industry engage with Government mainly through the Building Code.

As a developer and investor, Government is a significant provider of social housing and provides loans, subsidies and grants for purchase – like the

recent shared equity scheme and retrofit of homes EECA Energywise programmes.

As a capability-builder, Government is engaged in building the capability and capacity of the sector through education and providing knowledge and skills including:

- The implementation of systems for building consent authority accreditation, the licensing of building practitioners and the establishment of the regulatory framework for project certification.
- Funding housing research through the Research, Science and Technology portfolio, government-run research organisations in the housing and health areas, and government-commissioned research to support policy and programme development.

But the time lag between policy, regulation and tools to do the job is too great

While the proposed changes to the Building Code will provide improved minimum benchmarks for building performance and, for new homes, will mean less energy consumption and fewer emissions, the Building Code review also demonstrates a significant time lag exists between the creation of legislation and implementation. The review was mandated by the Building Act (2004) but is not expected to be implemented until 2009 at the earliest.

Local councils rely on the delivery of Acceptable Solutions that are Code compliant so that they can help builders and homeowners “do the right thing”. For some sustainable products and systems, these regulatory instruments are not present.

And there are few targets which aim to improve the one million existing homes

The Government and community retrofit programmes such as “Warm Homes” and

“Snug Homes” have focused on the low income bracket and little has been done to encourage middle and higher income earners to upgrade the performance of their homes. 20% of our households consume 36% of the total energy used. These high users are not being targeted through EECA insulation retrofit programmes, which mainly reach people who are low energy users.

While there has been significant development in the new Building Code emphasising adaptability and sustainability, there are few targets for the retrofit of the existing housing stock to improve home performance. Most proposals to increase the insulation of existing homes only speed up existing delivery systems and approaches – but these are slow and don’t deliver the potential performance improvements to address the scale of the problem. The problem will only be adequately addressed if the Government and the building sector align to meet consumer aspirations.

THE SOLUTION: A shared vision and a plan

There is significant opportunity through collaboration with the building industry to adopt a more integrated approach to improve the performance of our existing homes. A co-ordinated industry approach has the potential to unlock opportunities which match consumer aspirations and will reshape the industry to ensure delivery occurs.

A joint Building Industry and Government Strategy on Sustainable Homes, linked to nationally significant home performance targets, would have a shared vision and a clear industry-wide plan which will

- Provide clarity for both business and Government initiatives in improving the performance of our homes through an agreed policy framework
- Prioritise, set and commit to targets informed by research to achieve better performing homes through an agreed, specific and planned approach
- Promote behavioural change across the sector ensuring better performing homes become the norm and making it much easier to “do the right thing”.

This would enable the Government to apply effort where it will best effect long-term national scale

changes in the sustainability of new and existing homes, at the same time helping industry to better align to deliver the solutions.

Recommending performance levels supported by science to be achieved by new buildings through ongoing Building Code developments and establishing performance levels for existing homes will help industry, homeowners and landlords to focus on bringing together better retrofit outcomes for existing homes. Rating systems will be able to align with these performance levels.

Working with other agencies, Government can deliver community scale retrofit projects and upgrade existing housing stock to recommended performance levels. The Talbot Park retrofit project, Glen Innes, Auckland, demonstrates how this can be successfully achieved.

The Solution: A shared vision and a plan

Develop a shared industry/government vision including skills training; delivering regulatory improvements, research requirements to support implementation of the plan and resolving responsibility gaps.

Set agreed performance targets for existing homes and the funding to deliver them.

“If you don’t know which port you are sailing to, no wind is favourable.”

(Seneca the younger 4BC)



The Problem:

Homeowners know what they want but need help to achieve it

What consumers want in a home is much more than just the Building Code minimum or a renovated kitchen or bathroom – it's about modern look, comfort, warmth, feeling good about doing the right thing, and doing it sustainably in terms of low maintenance and resilience, energy and water efficiency.

Designs of individual houses and communities are more lifestyle orientated with larger open spaces, flow to the outdoors and larger window sizes.

House size and investment are increasing. The average size of a new stand-alone dwelling has increased from 190m² to almost 220 m² since 2000. The cost per m² of a new house has increased from just over \$800 in 2000 to almost \$1,100 in 2005.

Most new buyers and first-time renovators are managing their own renovation projects and they are increasingly relying on building centres and stores as a source of information, with a corresponding decrease in reliance on trades-people. Increasingly people are faced with having to “build” their own solutions from the myriad of individual product offerings available on the market.

We are seeing a decline in home ownership

This has significant implications for retrofit upgrades since there are different motivations between the landlord, who must meet costs for retrofit and the tenant, who enjoys the benefits of improved home performance.

There is an increasing affordability gap and investment in performance rather than appearance is not perceived to be financially justified

A 1,400 person global survey by the World Business Council for Sustainable Development found that respondents estimated the additional cost of building green at 17% above conventional construction, more than triple the true difference, which is about 5% higher. Our ShapeNZ research indicates New Zealanders are even more pessimistic, with 63% believing it cost 10% extra or more.

Even so, raising the performance of a \$700,000 new home adds an extra \$30,000 to the initial cost, despite being captured in the design phase.

The challenge is to reduce the cost to \$20,000 or \$10,000. For an existing home, there can be increased disruption and costs in retrofitting features

designed to improve the performance of a home, particularly when installing insulation in wall cavities.

Building Code improvements are justified on cost savings. Most middle income renovation decisions are not driven by cost savings. Where cost is a barrier a loan secured against the estate of the owner or paid back from energy savings could help bridge the gap.

There is an apparent disconnect between what people want and what they are being offered

It can be extremely difficult for homeowners and renovators to find the best solutions for their homes which also deliver their aspirations for comfort, lifestyle and modern look. The building industry, generally, is unaware of how to package their products together to meet these aspirations.

“Information on optimal solutions to retrofit old houses is not readily available.”

“Can’t decide which is the most important to start with.”

New Zealand home owners, ShapeNZ Housing Survey, 2008

THE SOLUTION: Market research – connecting consumers with integrated solutions that deliver better home performance

Consumer research is needed so businesses can develop renovation packages that meet the aspirations of homeowners.

32% of New Zealand consumers can be classified as belonging to a market segment known internationally as LOHAS or, locally as Solution Seekers, interested in green building and lifestyles, socially responsible investment and sustainable living. 40% of New Zealanders claim to be modifying their lifestyle to reduce their impact on the world. The importance of lifestyles and behaviour cannot be underestimated. We need to better understand the drivers of consumer behaviour that see value in installing insulation and other home performance improvements, as much as the renovation of a kitchen or bathroom.

Understanding these drivers is important if we are to be successful in improving the performance of our existing homes. Currently, a knowledge gap exists in determining how to make this aspiration for better performing homes generate demand to “do the right thing”. Without this demand, industry will see little benefit in providing packages which deliver appropriate home performance improvements. The place, structure and form of incentives to “do the right thing” similarly need to be evaluated.

Only about 20,000 new homes are built each year but there are 80,000 renovations occurring each year

Consumers can drive specifications beyond the Building Code in the new residential market; pay more for higher performing residential rental properties; or include sustainable features in renovation projects. Manufacturers, retailers, builders and designers need to accelerate the coordination of their response so that they package their offers to make it easier for consumers to get the most effective match for what they want with the range of options available.

“Getting good quality advice and options will be helpful.”

New Zealand home owners, ShapeNZ Housing Survey, 2008

The Solution: Market research – connecting consumers with integrated solutions that deliver better home performance

Undertake market research so the building sector understands how to market comprehensive home performance improvements to the renovators’ market.

This will help the sector to develop and incentivise basic upgrade packages for existing homes types.



The Problem:

Currently there's no value payback for improved home performance reflected in higher house prices after renovations

While there is considerable evidence that the homeowner and occupier would like their homes to perform better, and this could be delivered, there are multiple factors holding back change. Since sustainable features improving the performance of a home are generally “out of sight” such as insulation in the walls, ceiling and under the floor – consumers need something which links the value of these improvements to a better price for their property. ShapeNZ research indicates that only a small minority of purchasers check these features before they buy.

Why invest in insulation for no value payback when the common retrofit opportunities for added value are to upgrade the look with a new kitchen or bathroom?

There are a number of existing and new initiatives such as the Healthy Housing Index (HHI) currently being trialed and the Home Energy Rating System (HERS). These provide some indication of the benefit and value of inclusion of sustainable features in a home. However, New Zealand has yet to achieve high levels of uptake that occur overseas of a well integrated and applied sustainability rating system and tools for housing. The Building Code provides for a minimum performance level. Increasing minimum Building Code levels have a very slow impact on the existing housing stock due to the high number of upgrades occurring which do not require a building consent.

“Understanding the environmental performance of a building should be as easy as understanding the performance of your vehicle via its Warrant of Fitness. Why do we not ask how energy efficient our buildings are, how much water they use, how warm they are or what the air quality is like? Do we have faith that our Building Code can deliver a home that performs well in all of these areas?”

Jane Henley, Chief Executive NZ Green Building Council.

THE SOLUTION: A home performance rating system

A well integrated and generally applied home performance rating system is needed to directly link the value of building and retrofitting for improved performance. We believe the model of private and public sector collaboration which lead to the Green Star rating for commercial buildings, will work for the residential sector if it is supported by both central Government and the private sector. It has the potential to be a win-win for owners, tenants, builders, financiers and insurers.

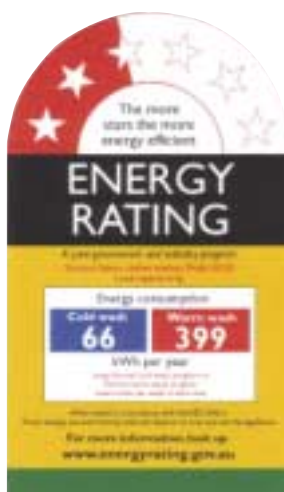
Ratings link performance and value – so you’ll know if you live in an eco-home or an eco-disaster

Rating systems allow homeowners and landlords to assess the value of investments aimed at improving performance of a home, particularly where this is beyond the Building Code specifications. An easily accessible, widely promoted system would help owners and occupiers to link their aspirations for their home-comfort, look and lifestyle – with improvements

and features making their homes perform better. Anyone buying or renting a home will be able to understand the costs and benefits of different levels of comfort, warmth and energy and water savings of the home – whether it’s an eco-home or an eco-disaster!

A rating system works for the building industry as well. It provides opportunities for industry to develop and deliver solutions for homes that provide better home performance than at present. Builders and others in the industry will be able to use this to differentiate themselves and tap the market for better performing homes.

Rating systems help us to keep raising the bar for new buildings. Internationally, as rating systems have become embedded in the built environment through market growth and acceptability, Building Code minimums have been aligned with specified rating levels. Overseas, buildings with higher performance ratings sell at a premium. In Seattle, environmentally certified homes sell for 5.9% more and stay on the market for 24% less time than comparable homes.



A ratings requirement for rental properties before they can be rented out will help accelerate performance improvements for the growing rental segment of the housing stock. It would support and increase uptake of Government initiatives like the 60% subsidy currently available to landlords to insulate rental properties. Progressively improving the performance of a rental property, affirmed by an independent rating assessment, is likely to help a landlord to secure a rental premium and encourage tenants to stay longer. The Government should consider explicitly linking paying accommodation supplements to landlords and tenants for better performing rental properties. The average performance of the rental stock will improve landlords are encouraged to upgrade the homes they rent out.

We need ONE rating system not multiple confusing systems

Using existing work in ratings and consolidating these into a single rating system is important. Multiple systems confuse the homeowner and occupier. The rating system needs to be sufficiently comprehensive to address a range of housing types and ownership models.

Once a rating system is in place, it is recommended that the rating of a home, at first voluntary, become a mandatory requirement at point of sale or lease, or rental for all homes within a set timeframe.

The New Zealand Green Building Council is developing Green Star for Homes, in partnership with BRANZ and other key stakeholders. This will initially be for new homes, overtime extending to existing homes.



Meridian Building in Wellington

Case study: Ratings DO work

The development of Green Star for commercial buildings

GreenStar NZ is New Zealand's first comprehensive environmental rating system for new buildings which evaluates building projects against innovation and eight environmental impact categories. Six further rating tools are under development: industrial/light commercial, education, residential.

The development and uptake of the Green Star rating system for commercial buildings shows how quickly the building market can change. Success for the commercial sector was dependent on industry developing a solution which was accepted by Government and adopted by the commercial building market. While initially directed at the new build market, the Green Star rating is now being used in the retrofit one.

The Meridian building on Wellington's waterfront received a 5 star rating under Green Star. The building maximises natural light and ventilation and passive systems, provides energy and water efficient solutions and is preferred by staff as a place to work.

Commercial tenants: The benefit is attracting the 'eco-aware' workforce

Building owners compete to attract commercial tenants. Eco-friendly buildings and green leases are emerging as valuable features in securing quality tenants and increased returns over the long term. Commercial tenants compete to attract and retain a highly skilled workforce which is younger, more affluent and mobile – and 'eco-friendly' buildings and workplaces generally provide comfortable, productive and healthy working environments.

Is value being realised?

A recent Australian study, Valuing Green by the Green Building Council of Australia, overwhelmingly points to Green Star commercial buildings enjoying a market premium over non Green Star buildings.

The Solution: A mandatory home performance rating system

Government and the building sector support one mandatory home performance rating scheme.

Make this mandatory within an agreed timeframe for existing and new homes at point of sale or rental. Possibly link access to accommodation supplements to better performing rental properties.

Apply the rating to home upgrades by the Housing Corporation.



The Problem:

The building industry sells individual products not integrated solutions that best deliver better performing homes

While sustainable products are available, home buyers and renovators are not being presented with complete solutions, such as the best combination of insulation, heat pump and heating, energy efficient kitchens or water efficient bathrooms for a 1950s house being renovated. Consumers are to a degree confused by the range of options available. It is difficult to link each product with the overall solution they are seeking.

For example, if you're advised that installing a wood burning stove will give you a comfortable, warm, energy efficient home, you'll buy a wood burning stove, rather than combining increased insulation with a heat pump and a smaller heater or wood burning stove.

The renovator market (and to a lesser extent the residential new build) is dominated by "homeowner" project managers often learning from their first time experience. The renovator market is very fragmented and serviced by small businesses. They often struggle with lack of knowledge, skills and capacity to understand the potential for developing targeted solutions for lifting home performance. Small businesses can rarely do the market research necessary to help them identify the "best" solutions they could develop. They don't know how to market these solutions or what scale is required to ensure they secure a large share of the potential market. They also lack the capital to develop a business supplying integrated solutions.

So we often see off-the-shelf products that builders are ill-equipped to install, require consents that limit application and do not actually provide the best overall solution sought by the homeowner.

Combined with a risk averse building industry with regard to new building systems in the wake of “leaky homes”, the building sector

needs support to bring it into alignment with homeowner’s aspirations.

A global survey of attitudes among building professionals is believed to be typical of New Zealand’s builders. This shows the importance of personal commitment, coupled with know-how in driving change.

The building industry is slowly waking up to ‘green’ building but some have their heads down building flat out the way they always have

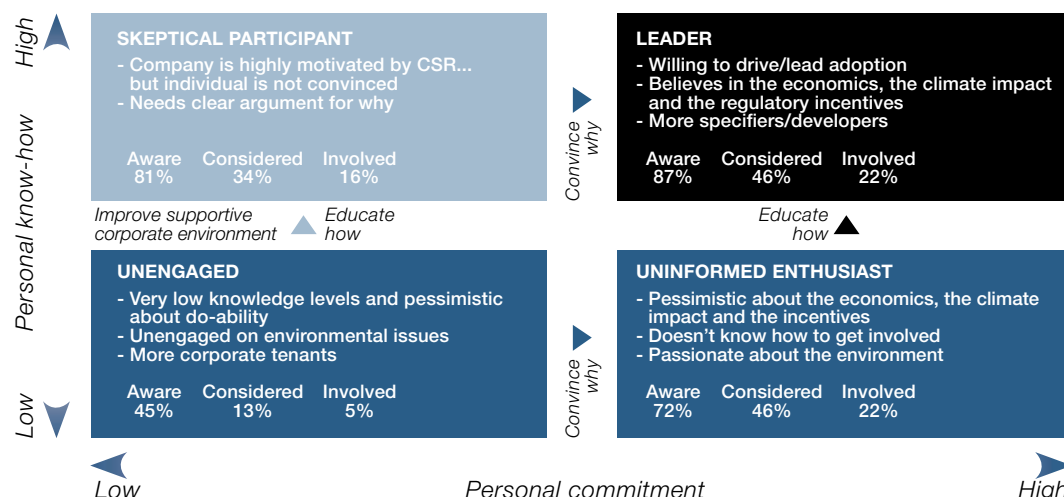


Figure 8: International survey of builders’/developers’ attitudes regarding greener buildings

Source: WBCSD

THE SOLUTION: Better alignment of the building industry

Consolidating and improving the alignment of the building industry and adoption of new business models to enable faster uptake of sustainable solutions by homeowners and landlords is critical.

The project identified a range of business opportunities offering better products and integrated solutions which have been identified, together with key supporting regulatory changes, which will better enable the building industry to deliver to homeowners’ aspirations.

Business opportunities worth millions

As the expertise and knowledge of the industry improves, so will the capability to deliver the best integrated solutions for existing homes. A co-ordinated approach will be necessary for all these business opportunities to be realised.

Products which deliver a specific outcome, such as retrofit double glazing for Auckland homes, need to be established before the businesses based on a combination of products, such as sustainable renovators, can emerge.

The Solution: Better alignment of the building industry

Encourage the introduction of a range of business opportunities offering building products and comprehensive solutions, that improve a home’s performance.

Use market research to motivate building sector renovation leaders to adopt new business models. Use Housing Corporation contracts for renovation to start the trend.

Business opportunities from improving the performance of our existing and new homes				
Business opportunities	Value proposition for homeowner and/or renter	Offer	Requires	Assists development of:
Home Performance Contractors (Insulation/Heat)	Delivery of energy efficiency and comfort for the consumer	Specifies, supplies and installs heating and insulation systems along with conducting home audits	Widely supported home performance rating system	Sustainable developers Sustainable builders
Installed Grey and Rain Water Systems	Provision of hassle-free rainwater harvesting and grey water systems	Specification, consenting supply and installation of water systems	'Green taped' acceptable solutions Changes to municipal water rating frameworks to encourage use of low water volumes. Rating system	Sustainable developers Sustainable builders
Retro – Insulation Service	Offers increased warmth, comfort, reduced power bills and potential for improved attractiveness of rental properties	Design, supply and installation service focused on whole house insulation for existing home market	Rating system Low cost options for wall insulation linked to redecorating and rewiring	Sustainable developers Sustainable renovators Neighbourhood redevelopers
Home Performance Auditors	Compliance with rating requirements for energy and building performance Increased resale value through evidence of increased home performance	Independent rating and certification of home performance	Rating system, training	Sustainable renovators, Sustainable builders
Retrofit Double Glazing	Contributes to reduced power bills, noise and condensation reduction, improved indoor air quality	Measure, supply and install double glazing to existing window frames	Rating system, Green Taped acceptable solutions for retrofit double glazing	Sustainable renovators, Neighbourhood redevelopers
Efficient Hot Water Systems	Reduced cost of hot water	Businesses already exist which specify, supply and install solar glazing and heat pumps in new and existing homes	Rating system where better performing hot water and heating solutions will be valued	Sustainable builders, Sustainable developers
Sustainable Builders	A new home that meets the needs of your family while protecting the environment and providing lower operating costs	New home market focus leveraging on client awareness of sustainability and provides above code level specifications	Acceptable solutions and a widely supported home performance rating system	
Sustainable Developer	A new home in a community that shares your values, has lower operating costs and cares for the environment while improving health	Community scale offering of new homes meeting better performance standards and with sustainable infrastructure	Alignment of consenting processes; urban design protocols with neighbourhood redevelopment	Sustainable builders
Sustainable Renovators	A home renovation that provides additional space, health and lifestyle benefits while reducing the running costs of your home	House additions and alterations that use sustainable materials, building practices and design features	Ratings system Shift towards greater project management of renovations by industry professionals	
Neighbourhood Redevelopers	Community need for improved living environment and health benefits	Rapid redevelopment or upgrade of area	Rating system, business unit drawing together project manager/developer, HCNZ, local council, DBH, DHB, community groups, corporates, homeowners	Scale opportunities for Sustainable Renovators



The Problem:

Anything out of the ordinary takes too long

The national and local legislative framework is at best a difficult journey and at worst a maze for the homeowner and builder to work through.

Multiple regulation drives uncertainty in the consent process

Local government provides leadership on urban issues, regulates and manages the pattern of urban development through the Local Government Act 2002 and the Resource Management Act 1991. At times the differences in focus at each regulatory level – local, regional and national – results in different preferred pathways and priorities for development, and the potential for different sets of outcomes across each of the 85 local authorities involved in consenting. This lack of consistency and alignment in the regulatory framework generally raises barriers rather than providing support

for innovation, resulting in great uncertainty for consumers and builders.

It's more than just houses; it's about community

Recognising that improving the performance of housing does offer councils ways to meet objectives around healthy sustainable communities. Councils are responding to this challenge to encourage more sustainable building choices. A range of direct approaches can be identified such as fee rebates for building consents for products and solutions that have pre-approval. However changes to existing standards and plans – which can, for example, restrict optimum location of dwellings in relation to solar design, sending inconsistent signals. Maximum density of a site by building to the road may be inconsistent with reducing energy

costs by making the building's roof north-facing are more slow to emerge and continue to favour more conventional solutions.

Some councils have appointed Eco-advisors and offer free consultations to residents on how to make their homes healthier, water and energy efficient through retrofitting sustainable solutions.

The legacy of leaky buildings

In the wake of the leaky buildings syndrome, councils are, not surprisingly, risk averse and favour conventional, proven solutions (which may be less sustainable).

As a result, builders report that the approval process delays for "new" or "different" products and building compliance requirements have increased considerably the time and the costs involved.

Compliance costs have escalated

Since Leaky Homes broke in 2001

A client from walk in to start took **4 weeks**
now **4 months**

A one level set of plans was **8 pages** of A3
now **17 pages**

Supervision cost was **\$800** per home
now **\$2800**

Plans **\$600** now **\$3400**

Inspections were **6** total at **1** day's notice each
now **15** inspections at **5** working day's notice each

These are only samples of the now everyday situations!

Source: Stonewood Homes

THE SOLUTION: Shifting from red to green tape

The new build and renovation markets need regulatory change whereby "green tape" speeds uptake of more sustainable solutions. This should remove the barriers experienced by the building industry and homeowners who are trying to "do the right thing" and incorporate higher performance features in their homes.

We need to fast-track the approvals process for clearly defined acceptable performance improving solutions

Councils have objectives around healthy, sustainable communities which better performing buildings can help achieve by reducing energy and water consumption, and improving people's health. But councils need to specifically encourage sustainable building through both plan rules and policy. Fast-track approval of sustainable solutions by regulatory authorities is fundamental in encouraging uptake. This requires prioritising improvements in regulatory process, and aligning planning and policy with key outcomes which improve the performance of our homes.

For example, local regulations and poor alignment of planning and policy can be a significant hurdle in approval of greywater and rainwater harvesting systems, particularly in the renovation market. Part of the solution to achieving water savings opportunities will be the development of clearly defined acceptable solutions for fast-track approval, and direct charging for water and water treatment separate from general rates in all regions.

Making it easier for owners and builders to choose to do the right thing

Consenting and approvals processes must support consumers' choices for sustainable features. Reducing consent times for sustainable features; providing sound advice; using and providing financial incentives to drive change and incentives for the take up of home performance improvements.

Leadership by local government is critical

Through council-controlled organisations involved in urban development and associated housing projects, including Waitakere Properties Limited and Tomorrow's Manukau Properties Limited, councils can provide leadership and deliver significant outcomes for communities and residents. These initiatives can be used to further improve in policy, planning and process so the interaction with the regulatory function of councils for those homeowners wanting to 'do the right thing' is more user-friendly. Councils and DHBs should champion the renovation of whole suburbs known to have a high proportion of poorly performing homes.

The Solution: Shifting from red to green tape

Through faster consent processing or pre-approvals, introduce 'green tape' to speed uptake of comprehensive solutions that are known to improve home performance.

Strong support through council policies and plans for solutions that improve home performance.

The benefits of the five point solution

Shared vision

Market research

Mandatory home
performance
rating system

Better industry alignment

Red to green tape



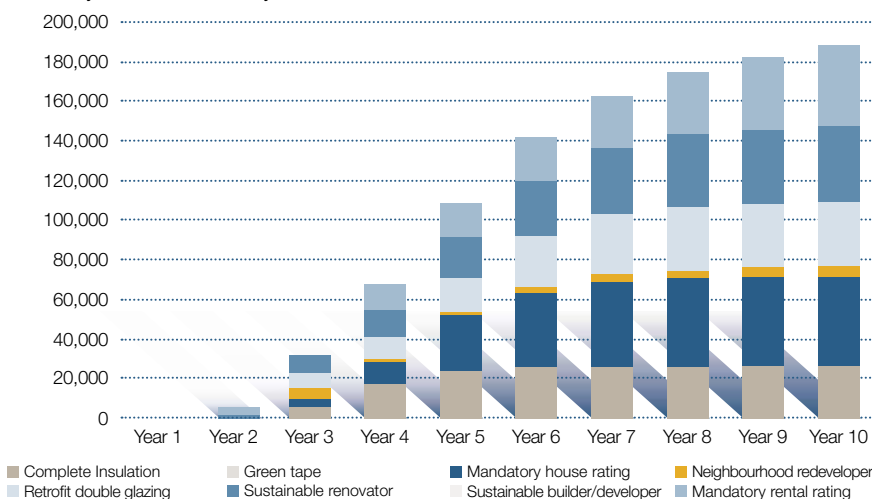
There are significant benefits once solutions are introduced

Enabled through a Government/private sector strategic plan and market research, each of the new building systems, business opportunities, rating system and regulatory changes provide significant benefits. These have been measured in terms of reduced energy, water consumption, increased production and reduced hospitalisations.

Sustainable Renovator, Retrofit Double Glazing and Mandatory House Rating opportunities are key to achieving significant change in existing homes. While the Neighbourhood Renovator does not in itself drive significant change, it does provide a growth opportunity to increase the capacity and capability of the industry and achieve economies of scale while minimising household movements during renovations. Projects at this scale will greatly assist the Sustainable Builder, Sustainable Renovator and Sustainable Developer business models to flourish.

Shifting from the voluntary House Rating to a mandatory rating at point of sale or rental will have a substantial impact on lifting the performance of existing housing stock. Retrofitting Insulation and Retrofitting Double Glazing systems are the key drivers to bring these benefits.

Work days recovered each year



Healthier homes means fewer days off work

780 people don't turn up to work each day because cold, damp houses contribute to their illness. Improved productivity and savings of 180,000 work days are available through retrofitted insulation and retrofitted double glazing resulting in healthier homes. This equates to at least \$17 million a year in lost production based on a conservative minimum wage of \$12ph.

Figure 9: Improved production through healthier homes

Lower home energy use

A saving of 2.5 billion kWh by improving the insulation envelope of homes through a combination of insulation and double glazing systems. This equates to approximately \$475 million in energy savings or \$300 per household each year.

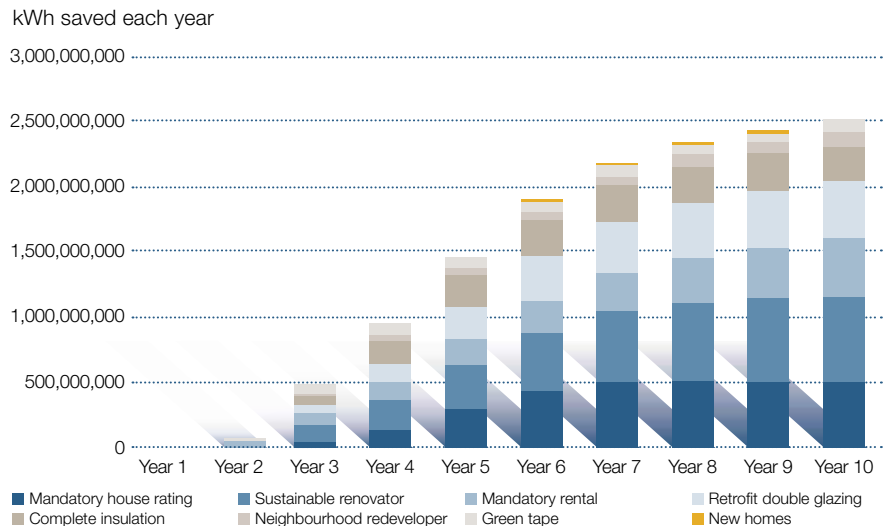


Figure 10: Energy savings

Fewer hospital stays

50 fewer hospital stays each day (ward beds or emergency clinic) on average will occur because homes will be warmer and drier. A total savings of 18,000 annual hospital stays for respiratory conditions¹. One bed night costs us around \$3,000.

¹ These metrics have been assessed using key research conducted by the University of Otago Medical School, Wellington. They are indicative only recognising the difficulty in extrapolating to a bigger community level of predicted benefits. We are supportive of further studies in this area with a larger population base to improve the data available for this form of assessment.

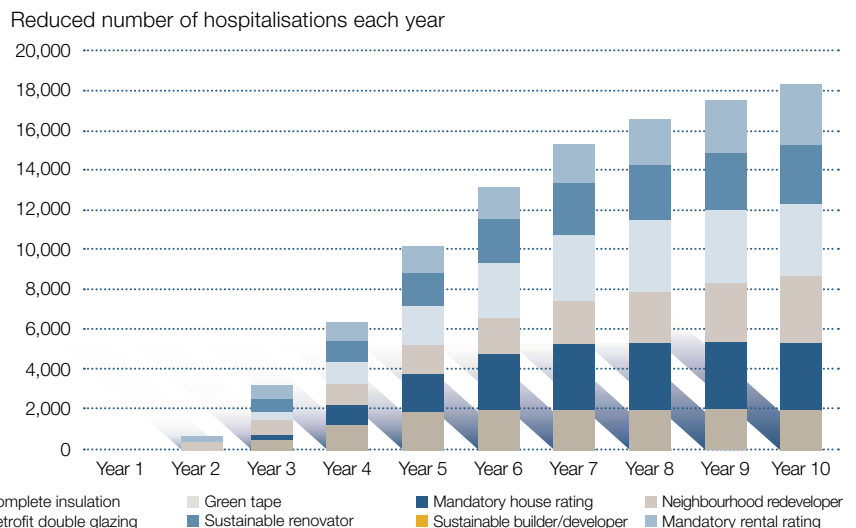


Figure 11: Reduced hospital stays

Huge water savings

Enough water to fill 9,200 olympic-sized swimming pools could be saved each year, equivalent to 8,000 homes' annual water consumption. Introducing the sustainable renovator business, with local regulation enabling changes, will save 23 million cubic metres of water each year.

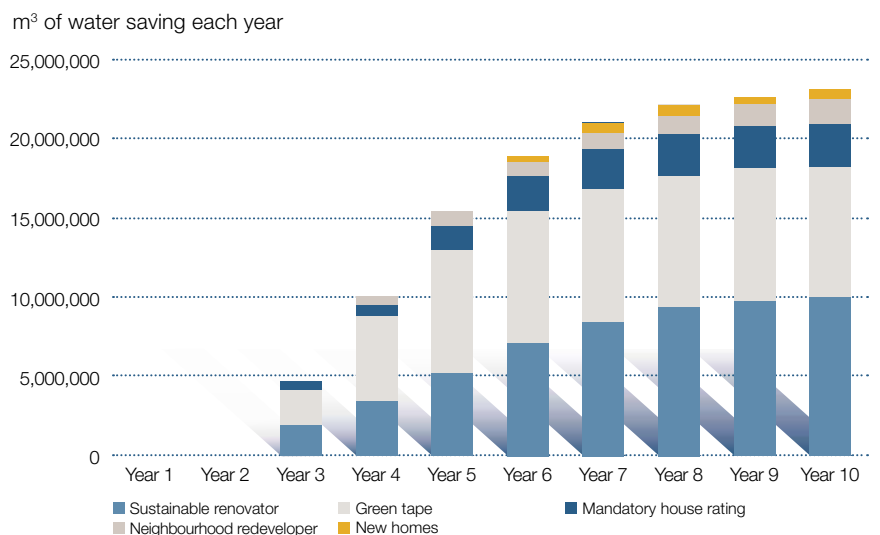


Figure 12: Water savings

The Vision: Making it happen

Driving change to better homes and better communities – who needs to do what?

There is a need for strong leadership in this sector and we recommend that a strategic plan for sustainable building is developed, with some urgency, by a joint Government-industry-wide partnership. Significant support is emerging for a form of Government and Industry partnership (viz Sustainable Building Pathway, July, 2008; Ministerial Forum: Building and Construction Sector, August, 2008) and this momentum needs to be maintained.

Shared Vision

Market research

Mandatory home performance rating system

Better industry alignment

Red to green tape

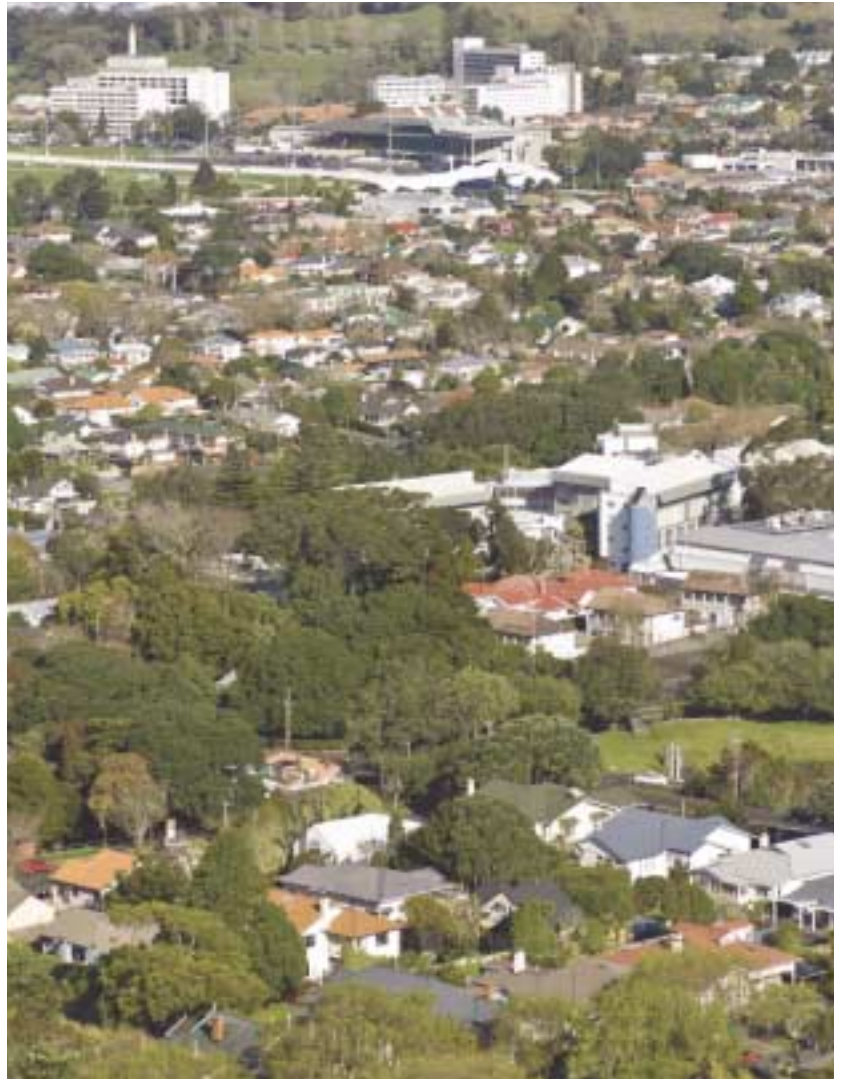
Responsibilities	Central Govt	Local Govt	Owner /occupier	Rental owner	Industry	Financers/ Insurers
Loans and expanded scope of EECA programmes	•	•	•	•	•	•
Increased rate of upgrading HNZC stock	•				•	
Increase building industry capacity and capability through education, training, update training	•				•	
Building Code minimums and targets for future	•	•		•	•	
'Green tape' for sustainable solutions including acceptable solutions	•	•			•	•
Provision of single, simple home performance rating system	•				•	•
Communication and information to industry on consumer choices	•	•			•	•
Research and development – innovation in products, processes, services and systems of organisation	•				•	
Performance targets for existing housing stock	•	•			•	•
Market research on consumer aspirations for home performance	•				•	
Leadership in community renewal/retrofit	•	•			•	
Develop business opportunities					•	•
Take up opportunities for retrofit			•	•		•

Figure 13: Where responsibility for making it happen lies

Central Government responsibility for making it happen

Government has a pivotal role and needs to consolidate and lead the case for change. It must deliver targets specified in the strategic plan for sustainable building. At Central Government level action needs to be taken to

- Consolidate and lead the case for change and delivery of targets specified in the Strategic Plan for Better Performing Homes across individual agencies.
- Develop the Building Code to accelerate improved performance of the built environment. The current work of the Government in reviewing the Building Code will ensure that new housing stock has improved performance and will use about 30% less energy and produce fewer emissions. We recommend development of specific, measurable targets for increasingly improved building performance levels of new buildings related to overall strategic plan goals. These performance levels would be delivered through achieving Building Code requirements.
- Recommend performance levels, supported by science, to improve existing housing stock, both owner-occupied and rental.
- In collaboration with industry, promote a single, simple performance rating system for all dwellings (new, existing owner-occupied, existing rental) developed from existing tools. The introduction of this rating system would transition from voluntary to mandatory within a fixed limited timetable (i.e. five years maximum). It would need to be presented to prospective purchasers/tenants at point of sale or lease.
- Make it easy for builders and consumers to 'do the right thing'. Based on the strategic plan, this would include prioritising development of regulatory documents (e.g. acceptable solutions) to speed up consenting processes.
- Provide assistance, beyond the current low income focus of EECA programmes, to households to retrofit their existing houses to achieve recommended performance levels.
- Extend existing retrofit programmes to deliver solutions for existing housing stock. These programmes need to be aligned with recommended performance levels for existing stock and should include: higher standards of insulation; double glazing energy efficient water heating options; space heating and water efficiency options.
- Explore further options to ensure rental market uptake of retrofit to recommended



performance levels through options targeted at landlords (grants and rental supplements) and tenants (accommodation allowances tied to better performing homes, other low energy/ water use incentives).

- Accelerate upgrading Housing New Zealand's approximately 80,000 household units to recommended performance levels. The Talbot Park retrofit project, Glen Innes, Auckland provides significant leadership on how this can be achieved.

In collaboration with industry

- Prioritise training and NZQA/ITO recognised qualifications relating to aligned industry
- Disseminate findings from market research, specifically addressing the retrofit consumer
- Ensure ongoing communication and information for consumers and the building sector regarding choices and the need for better performing homes.

Local Government responsibility for making it happen

Councils under the LGA and RMA have explicit regulatory responsibilities for buildings. Councils have objectives around healthy, sustainable communities which sustainable buildings can help achieve. However, the regulatory framework generally raises certain barriers to delivering better performing homes. To achieve these objectives, local Government must identify and remove barriers to sustainable building and then explicitly encourage its uptake through

- Shifting consumer/builder perception and existing reality of consenting process for sustainable options from red tape to green tape. Green tape includes: rebates, fast-track permitting/consenting, reduced or nil fees for certain features.
- Specifically incentivise better performing homes through planning and policy such as:
 - development controls that require sustainability features
 - standards for infrastructure provision (roads,

water, wastewater) and related codes of practice that encourage low impact approaches and use of sustainable solutions (e.g. rainwater reuse)

- allowances and possible exemptions for sustainable features (e.g. rainwater tanks) which enable higher performance levels of sustainable buildings to be achieved within existing standards
- aligning use of other policy interventions such as development contributions, rates remissions for sustainable buildings.
- Allowing homeowners to move to direct water and wastewater charging if they have water efficient homes or upgrades.
- Provision of eco-advisors for home renovators and new home builders.
- Collaboration and working with other agencies to deliver community scale retrofit of existing homes.
- Planned upgrade to recommended performance levels of council-owned housing stock.

Building industry responsibility for making it happen

Industry needs to

- Cooperate with Government on market research to size the market for warmer, more comfortable, water and energy efficient homes and renovations.
- In collaboration with Government, develop, promote and use a single, simple home performance rating system for all dwellings (new, existing owner-occupied and rental) developed from existing tools. Communicate with the building industry how this tool will enable individual businesses, from suppliers to builders/trades, to differentiate themselves in sustainability terms.
- Improve alignment and capacity of the building sector to deliver sustainable solutions which meet the recommended performance levels of the rating system.
- Find and resource the skills required for businesses to devise attractive sustainability propositions at appropriate cost levels for new and existing homeowners, based on targeted consumer market research.

- Collaborate with government to:
 - have ongoing dialogue regarding consumer choices and the need for change
 - prioritise training and development of NZQA/ITO recognised qualifications required for sustainable building and retrofit targets
 - prioritise ongoing research and development and innovation into products and systems combining products and building related services to deliver targets as specified in Strategic Plan for Better Performing Homes.
- Shift building professionals' personal know-how about the benefits of building 'green'.
- Work with manufacturers of sustainable products, builders and retailers to provide a complete solution for consumers. Currently we see off-the-shelf products that builders are ill-equipped to install, require consents that limit application and do not, in and of themselves, provide the overall sustainable solution sought by the homeowner.



Consumers' responsibility for making it happen

Consumers also need to take action through

- Take-up of opportunities for retrofit available through incentives.
 - Understanding that the value of benefits of the rating system will be reflected in either the value of their home or the ease of sale.
 - Recognising the value of benefits of improved living environment and health benefits associated with sustainable features in the home.
- Engagement with eco-advisors when renovating and building new homes.
 - Possibly engage in sustainable communities through community retrofit programmes.
 - A shift to seeking 'whole' of building solutions rather than single fix offers.

Roadmap to better performing homes 2009 – 2019

The timing for the implementation of the 5 point plan has been considered. A Government – Industry Strategic Plan drives the shift to a better aligned industry and regulatory environment able to provide consumers with solutions that meet their aspirations for better performing homes. Once initial strategic plan has been agreed it is recommended that a pan-sector industry body takes leadership and responsibility for meeting the specified targets.



INDUSTRY STRATEGIC PLAN

Market Research

Undertake consumer research
Communicate findings to industry
Target market and business opportunity analysis

'Eco-advisors' for re-orienting small
business to sustainability
Value case for consumer incentives, loans

Support supply chain partnerships

Size of Existing Housing Problem

Timetable by Year

1

2

3

4

5

6

7

8

9

10

Continued development and
expansion of rating tools

Mandatory rating existing
homes – point of sale, rental

Mandatory rating new homes
Voluntary rating existing home

Pilot existing homes tool

Tool for existing homes
Rating new homes

New homes
Voluntary HERS

Finance
Plan

Further DIY 'green'
retrofit packages

FINAL
TARGETS
ACHIEVED

Better performing
homes and communities

- \$475 million energy savings pa
- Water savings filling 9,200 olympic swimming pools pa
- 50 fewer hospital stays each day
- 780 more people turn up to work each day because they, their family are healthier



Benefits and costs

By rolling out the initiatives identified in this study for residential properties within the next decade, we estimate annual cost savings in excess of \$500 million. These come from:

- *energy savings of circa \$475 million through a combination of insulation and double glazing;*
- *\$17 million from increased production from living in healthier homes; and*
- *\$32 million saving to the economy from reduced hospitalisation.*

These savings are supported by a National Value Case Study conducted by Beacon Pathway which demonstrated that a range of five innovations, (including retrofit ceiling and floor insulation, space heating, energy efficient lighting, water heating using gas, solar and heat pump systems, low flow water devices and appliances, water metering and pricing) spread over 20 years, would generate a direct economic gain to households equivalent to 1% of GDP by 2017 or about \$2 billion. Non-monetary benefits of healthier more comfortable homes and environmental benefits, such as GHG reductions at little net cost, are additional.

Costs

The most significant initial cost will be the alignment of regulatory processes (both local and central Government) which will deliver agreed strategic plan targets. Further significant costs are likely to result from the development of the ratings system and streamlining its integration into the building and regulatory sector. Given the scale of the problem – one million underperforming homes – the capital cost of the upgrades will be more than \$20 billion over ten years.



Summary

Problem	Solution	Benefits
There is no shared vision on how to sort out our one million under performing homes	Develop a shared industry/government vision including skills training; delivering regulatory improvements, research requirements to support implementation of the plan and resolving responsibility gaps. This will require agreed performance targets for existing homes and funding targets.	Upgrading one million homes will deliver: Energy savings equivalent of 9PJ community benefits each year. Health savings of up to \$54m. Economic benefits of \$17m through increased productivity.
Homeowners know what they want but need help to achieve it	Undertake market research so the building sector understands how to market comprehensive home performance improvements to the renovators market. Develop and incentivise basic upgrade package for existing homes types.	Home user benefits through improved quality of life through warmer, healthier homes that match consumer aspirations. Reduced the energy demand from homes, by \$475m pa, hence GHG reduction at little cost. Reduced demand for reticulated water.
There's no value payback for investments in improved home performance from increased house prices after renovation	Back one home performance rating system for new and existing homes. Make this mandatory within an agreed timeframe for existing homes at point of sale or rental. Link access to accommodation supplements to better performing rental properties.	Better performing homes will have a premium value in the market place. This will be reflected in the value of homes at on sale or rental.
The industry sells individual products not integrated solutions, that best deliver better performing homes	Encourage the introduction of range of business opportunities offering building products and comprehensive solutions that improve a home's performance.	Better aligned industry. Building sector growth-opportunities. Achieve performance upgrade of both low and middle income owner occupier/rental housing stock.
Delays in Council consenting holds back innovations for better performing homes. Anything out of ordinary takes too long	Through faster consenting or pre-approvals, introduce 'green tape' to speed uptake of comprehensive solutions that are known to improve home performance.	Replace current barriers experienced by the building industry and homeowners in trying to do the right thing. Reduce applications to consent time to days rather than months. This will reward the innovators who want to do the right thing while accelerating the improved performance of our homes.

Taking the next step

The project highlights that improving the performance of our existing housing stock is the greatest challenge and opportunity in mainstreaming sustainability in our homes while New Zealand experiences a sharp downturn in its housing market as a result of the credit crisis. We need more comfortable, warmer and healthier homes which use less energy and water.

We seek central Government support for

- Funding the market research which will enable the building industry to scope the opportunity to provide solutions rather than just products to upgrade our housing stock.
- With the private sector setting targets and goals for improved performance of buildings new and existing and decide who should be responsible for what. The Building Code is likely to remain the domain of central Government with consumers' aspirations for better home performance to be met by the private sector.
- Recognising and supporting a mandatory home performance rating system so that home owners and landlords will obtain a value lift from improving the performance of the houses they own at the point of sale or rental.
- Over time linking accommodation benefits to a performance rated rental supplement for landlords of better performing rental homes.
- Green tape rather than red tape so that renovations to improve home performance can be given fast approval so that doing the right thing becomes the easier option.

A better performing homes visioning and planning summit bringing together central and local Government and the private sector building sector, financiers and insurers supported by consumer research would be the means by which a shared vision for improving the performance of our existing housing stock would be developed.

We welcome your input and feedback

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References

Amitrano L J, Kirk N R and Page I C, Market Segmentation of New Zealand's Housing Stock. *Report PR 106 for Beacon Pathway Limited*. 2006

Beacon Pathway, NOW Home case study, retrofit case study and illustrations used by permission. See www.beaconpathway.co.nz

Beacon Pathway, National Value Case for Sustainable Housing Innovations, 2007

BRANZ, New Zealand House Condition Survey, 2005

BRANZ, Study Report SR 155, 2006

BRANZ, Household Energy Use Project HEEP study

Chapman R, Howden-Chapman P, O'Dea D, A cost-benefit evaluation of housing insulation: results from the New Zealand 'Housing, Insulation and Health' Study, 2004

Cooper I, (Traffic New Zealand Ltd) and New Zealand Business Council for Sustainable Development, Mainstreaming Sustainability in Building, 2008

Faber Maunsell, A study into international directions for mandatory disclosure of the energy performance of buildings, Report prepared for Australian Government, 2005

Green Premium Revealed in Seattle Study, available from www.oikos.com/news/2008/06.html, 2008

Green Wave Breaking, available from www.righthouse.co.nz/homelab-learning-center/articles/green-wave-breaking, 2008

George Wilkenfeld and Associates, Mandatory Energy Performance Disclosure Requirements for Dwellings: Impacts in the Australian Capital Territory, 2001

McChesney I, and Amitrano L, Sustainability Options for Retrofitting Houses – Energy. Report TE 106a for Beacon Pathway Limited. 2006

Newman Miliband has blueprint for greener UK homes, available from www.carbonnews.co.nz/story.asp?storyID=2219&src=newsletter, 2008

New Zealand Energy Efficiency and Conservation Strategy, 2007

New Zealand Green Building Council, Case Study on Green Star for Commercial Buildings, 2006 used with permission

Oliver F, Analysis of results from Professional Builder's 2008 Green Building Survey, 2008 available from www.housingzone.com/probuilder

Ryan V, Turning serial renovators into sensible retrofitters, Presentation at Beacon Symposium, 2008

ShapeNZ, 2008 New Zealand Housing Survey, 2008

Storey J, Page I, van Wyk L, Collins M, Kreil T, Housing Retrofit – Housing Interventions, Stock, and Markets. Report RF1 for Beacon Pathway Limited, 2004

World Business Council for Sustainable Development, Energy Efficiency in Buildings – Business Realities and Opportunities, 2007

World Health Organisation, Indoor Environment: Health Aspects of Air Quality, Thermal Environment and Noise. HO/EHE/RUD/90., 1990



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