MT105

MARKET TRANSFORMATION INTERVENTIONS: CREATING DEMAND AND SUPPLY FOR SUSTAINABLE HOUSING

A REPORT PREPARED
FOR BEACON PATHWAY LIMITED

April 2007

The work reported here was funded by Beacon Pathway Limited
and the Foundation for Research, Science and Technology

MARKET TRANSFORMATION INTERVENTIONS: CREATING DEMAND AND SUPPLY FOR SUSTAINABLE HOUSING

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Market transformation interventions: Creating demand and supply for sustainable housing.

Report MT105 for Beacon Pathway Limited.

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EXECUTIVE SUMMARY

The purpose of this report, as laid out in the work plan, is to:

- identify best practice in market transformation through an international review
- generate a long list of potential interventions to influence supply and demand for sustainable housing
- generate a short list of potential interventions
- analyse the short list of interventions using recognised scenarios for future New Zealand housing

Using market transformation to catalyse demand for, and supply of, sustainable technologies and solutions is expected to bring Beacon closer to its goals and the high standard of sustainability for the New Zealand housing stock.

The research leading to this report has reviewed international practice in market transformation, together with learnings from previous Beacon reports. It has developed four options for intervening in the housing market seen as potential opportunities from the perspective of a group of New Zealand market experts. The development of four specific interventions was undertaken in the context of the New Zealand market, taking into account previous work with industry associations and consultation with a range of market experts from both the public and private sectors.

Market transformation is a process or catalyst for change, which originally focused on intervening in markets to bring about long-term improvements in market performance with respect to energy efficiency. The aim of market transformation research is to find market mechanisms for inducing lasting structural and behavioural changes in the market place that will bring about increased adoption of sustainable technologies and solutions. A key aspect of market transformation is removing market barriers that inhibit the manufacture and purchase of these technologies and solutions, and create the motivation for their ongoing use.

Both market characteristics and network dynamics across the housing industry are likely to impact on the effectiveness of market transformation programmes. Devising market transformation programmes to attain a minimum standard (e.g. the Building Code), is likely to generate results that fall short of performance potentials and will most certainly fall short of the Beacon high standard of sustainability. On the other hand, aiming for exemplary solutions can achieve results that outperform conventional designs and requirements.

The review of international market transformation research has highlighted the importance of understanding (housing) market dynamics (demand and supply) and the factors that cause market failure. The key lessons from the review are that the choice of instruments to intervene in the market must consider:

- all stages of the product's (house) life cycle; i.e. production, distribution, marketing and end-use
- technologies and the market structure
- political and administrative institutions and the multiple market actors
- market barriers on both the supply and demand sides.

A market transformation programme with the goal of improving the sustainability performance of housing is likely to require a mix of instruments that include policy interventions, economic incentives, monitoring and evaluation. Measures are needed to create both "supply push" and "demand pull". Supply-side approaches include requirements

for suppliers to improve product design considering all stages of the product's life cycle, performance and quality; minimum standards, labels and building codes. Demand-side approaches include education of consumers and professionals; incentives through finance or voluntary schemes, home performance audits and reporting.

For this report a comprehensive portfolio of options, or a "long list" of options, for influencing the uptake of sustainable technologies and techniques by a wide range of players in the housing industry was developed. The "long list" of options was generated from the review of international and national examples, and discussion with national housing industry representatives. It was reduced to a short-list of 20 interventions by working with a group of market experts, who subsequently agreed upon four interventions that they considered could be valuable in the context of the New Zealand market through a process of optimisation. This report details the four interventions that emerged through this process. These four interventions have the potential to impact on new, existing and rental housing stocks:

1. National Value Case. The National Value Case is a high quality publication that explains the national benefit to be gained by transforming the New Zealand housing stock to improve sustainability of homes. The purpose is to provide government with the opportunity to participate in commercial interventions by providing the business case for the removal of regulatory barriers and investment in sustainable housing.
2. Voluntary "WOF for every house" rating tool. The voluntary "WOF for every house" is a commercial intervention that builds on the Beacon high standard of sustainability by applying a voluntary environmental performance rating tool at point of sale of houses. It can also be used by tenants in choosing rented property, by banks to make mortgage decisions, by insurance companies to set premiums, and by councils to set rates. The purpose is to stimulate the demand for the environmental technologies and solutions and, in turn, stimulate the development of new products and services.
3. Council rates based on environmental performance. The voluntary "WOF for every house" rating tool will create a voluntary housing market based on environmental performance and provide the opportunity for proactive councils to pilot rates that include a factor based on the Beacon high standard of sustainability. This rewards early adopters of the voluntary "WOF for every house" and aligns with council obligations under the Local Government Act 2002 and other national policies currently under review.
4. "Trusted information". Trusted information is an education strategy for all stakeholders (consumers and producers) in the housing industry. The voluntary "WOF for every house" and related commercial developments create the need for information, especially comparative and locally-relevant information. "Trusted information" focuses on "smart" information tools that respond to stakeholder needs through signposting existing sources of information and providing decision-making tools to assist stakeholders to navigate and select relevant information for their needs.

The National Value Case intervention has already been agreed by Beacon, and work has been commissioned to further develop the intervention. The other three interventions will also require further work before they can be implemented.

The four key interventions complement or contribute to the Beacon high standard of sustainability (HSS). The National Value Case and Trusted information complement the HSS. The voluntary “WOF for every house” rating tool and the rates based on performance should incorporate the HSS targets in their design, measurement and reporting.

1 INTRODUCTION

It is liberating to remind ourselves that most of the technologies that a human being really needs to live an orderly, comfortable, and healthy life are ancient. Would anyone really want to seriously argue that robots are more important to human beings than cloth woven from spun thread, or computers more important than the house with roof, walls, and windows?

Lummis 1996[1]

The purpose of this report, as agreed in the work plan, is to:

- identify best practice in market transformation through an international review
- generate a long list of potential interventions to influence supply and demand for sustainable housing
- generate a short list of potential interventions
- analyse the short list of interventions using recognised scenarios for future New Zealand housing
- develop the short list as potential projects through a workshop with industry leaders[2].

The focus of the potential interventions or market mechanisms is that they have the potential to transform a significant proportion of the New Zealand housing stock to a quality defined by the Beacon high standard of sustainability. Beacon needs to understand where to apply its resources to best effect long-term national-scale changes in the demand, uptake and supply of sustainable technologies and solutions that improve the quality and performance of new and existing housing.

Transformation in the context of the housing value chain can be considered at a number of levels: **physical transformation** of the housing stock itself and demonstrating the benefits of improved performance, **economic transformation** creating an economic environment that recognises the value of improving the performance of the housing stock, and **market transformation** creating demand from consumers and supply by industry for improvements in the housing stock.

Improvement in the environmental performance of new and existing housing to the Beacon high standard of sustainability creates the need to engage all aspects of the housing value chain. Home owners and occupants are key components of the value chain and success in improving the housing stock is dependent on engaging these players in the market. The programme will need to align with the needs and preferences of homeowners and occupants.

This remainder of this report is structured in the following way: Section 2 sets the Beacon Pathway context for this work; Section 3 explains the concept of market transformation and covers the development of market transformation as a concept, a range of initiatives that have been considered internationally in recent years, the interventions employed and their expected or real impact. Some of the initiatives reviewed were found to have had clear success in transforming the market, while others were still a long way from that. It also explores success factors, as well as the most common challenges and reasons for failure. Section 4 outlines the drivers and barriers for market transformation in the New Zealand through a consideration of previous Beacon reports on issues relating to market transformation.

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[1] Lummis CD 1996. *Radical Democracy.* Ithaca, Cornell University Press.

[2]Smith 2006 *Beacon Workplan, Market Interventions, MT105*. Note: The scenarios work did not go ahead as the two quotes to do this work were rejected by Beacon

Section 5 documents the research process used to:

- build up a comprehensive “long list” of potential market transformation interventions
- translate this long list into a short-list of priority interventions from the perspective of a group of New Zealand market experts
- optimise the short-list into four interventions that the market experts thought could be valuable in the context of the New Zealand market.

Sections 6-9 develop the potential form of the interventions identified as a result of this process. The interventions covered in the report are:

- National Value Case
- Voluntary “WOF for every house” rating tool
- Council rates that include environmental performance
- Trusted information.

Section 10 pulls together the summary and conclusions including a discussion on how the four interventions contribute to the Beacon goals and high level of sustainability.

2 BEACON CONTEXT

Beacon Pathway is dedicated to research that will generate sustainable homes and neighbourhoods by changing the way the residential built environment (RBE) in New Zealand is designed, built and modified. Beacon's vision is:

Creating homes and neighbourhoods that work well into the future and don't cost the Earth

Beacon is working towards the following goals:

- To bring the vast majority (90%) of New Zealand homes to a high standard of sustainability by 2012
- Every new subdivision and any redeveloped subdivision or neighbourhood from 2008 onwards be developed with reference to a nationally recognised sustainability framework.

Beacon has identified four key targets for which performance must be improved in New Zealand's RBE to meet a High Standard of Sustainability (HSS):

- Energy
- Water
- Indoor environmental quality (IEQ)
- Materials (including construction waste).

Meeting these targets will require Beacon to be involved in a range of activities. Most importantly, it is Beacon's role to provide a robust evidential base for planning, decision-making and action. To do so, Beacon has developed a research programme around five interlinked and embedded research nodes and objectives:

- Sustainable homes
- Sustainable neighbourhoods
- Technology
- Policy and regulation
- Market transformation.

Beacon' research programme is demonstrated by the following diagram (see Figure 1). This report contributes to the market transformation research stream. The objective of the market transformation research stream is:

> *Developing a market transformation strategy of targeted interventions that will reduce barriers and enhance drivers affecting the uptake of sustainable technologies and solutions for New Zealand homes and neighbourhoods.*

Figure 1 Beacon's research streams

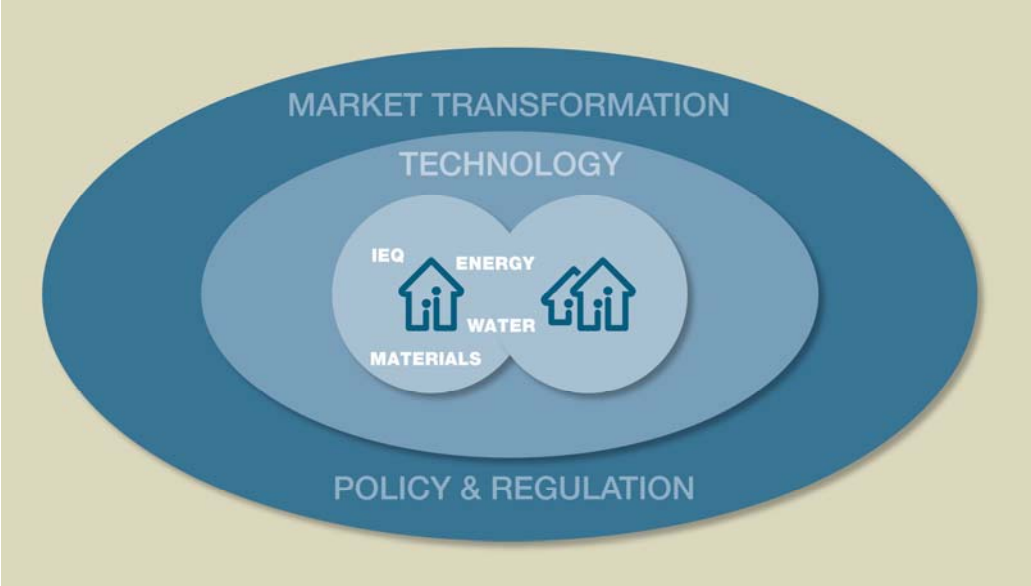

Table 1 gives the detail of Beacon's targets for moving New Zealand homes and neighbourhoods to a HSS.

Table 1 Beacon Pathway's targets for homes and neighbourhoods

Short Title	***Beacon's targets for Homes***
Energy 1 – demand	90% of New Zealand homes use energy efficient systems for water heating, space heating, lighting & appliances, and have a high standard of insulation (to maintain minimum temperature of 18°C), by 2012. Thus reducing the demand on reticulated energy from homes by 40%.
Energy 2 – generation	All homes will have a minimum net 50% of their energy supplied from local renewable sources and have a minimum temperature of 18oC by 2020; AND All energy into all homes/neighbourhoods will be supplied by renewable sources by year 2040
Energy 3 – design	All new homes and consented renovations will be designed to reduce total energy requirements through active management of the passive solar and thermal performance by 2012.
Water 1 - demand	90% of homes reduce demand for reticulated water by 40% per capita and Council supply to domestic uses is reduced by 50% per capita by 2012; AND use of water within dwellings is appropriate for the quality & use.

Short Title	Beacon's targets for Homes
Water 2 - resilience	New Zealand homes and neighbourhoods have improved management of storm, grey and black water to decrease their negative impact on the residential and natural environment, thereby making a more resilient water system by 2020.
IEQ 1	Identify a minimum healthy homes threshold and decrease the number of homes falling below that threshold by 90% by 2012, thus improve quality of life through disease prevention.
Materials 1 - impact	ALL design / construction / renovation / demolition of dwellings in New Zealand's RBE will minimise any negative impacts* of materials by 2012. Thus leading to an improvement* in New Zealand's housing stock in terms of resilience to global challenges – climate change, resource availability, population change, by 2012.
Materials 2 - future	New Zealand becomes a world leader in sustainable building materials used in dwellings as 90% of new homes will be designed & built using a systems approach to the materials used, for functionality, sustainability, IEQ, waste, adaptability, affordability by 2020.
Materials 3 - waste	Minimise construction, renovation and demolition waste going to landfill in the most cost effective manner from design to build to alteration to deconstruction by 40% by 2012.

Short Title	Beacon's targets for Neighbourhoods
National Policy Statements	All relevant national policy statements recognise neighbourhood sustainability dimensions and reference the Neighbourhood Sustainability Framework (NSF) by 2010
Council Growth Strategies	All Growth Strategies reviewed or developed recognise neighbourhood sustainability dimensions and reference the Neighbourhood Sustainability Framework (NSF) by 2015
HNZC	By 2008, HNZC recognises the neighbourhood sustainability dimensions and use the Neighbourhood Sustainability Framework (NSF) for renewal of HNZC neighbourhoods and substantial HNZC housing developments
Property Developers	80% of property developers undertaking greenfields and brownfields developments in excess of x dwellings use the Neighbourhood Sustainability Framework (NSF) and tools by 2015
Territorial Authorities	Territorial authorities in growth centres and / or major population centres recognise the Neighbourhood Sustainability dimensions and use Framework (NSF) tools for all substantial new developments and renewals of neighbourhoods by 2015

3 MARKET TRANSFORMATION

3.1 Introduction

The Market Transformation concept emerged in the early 1990s, as a result of the experience gained on demand-side management for energy efficiency. Japan, North American and Western European countries were among the first to pioneer interventions aimed at promoting more energy-efficient products and services in the market in order to address energy shortages brought about by the 1970 oil crisis. At the time, the interventions were designed to achieve relatively short-term energy conservation targets and did not address the broader issues of market barriers to energy efficiency.

The interventions on demand-side management were implemented by governments and utilities and were intended to influence consumers' choices for the duration of the intervention (e.g. subsidising energy efficient appliances). However, in some cases lasting changes in the market were achieved – leading to the realisation that strategic and systematic intervention in the market (of which the end consumer is just one of the players) can be an effective tool for improving energy efficiency.

The term 'market transformation' was formally defined in 1992 at the summer school of the American Council for an Energy Efficient Economy (ACEEE)[3] as a strategic effort "*by utility and other organizations to intervene in the market, causing beneficial, lasting changes in the structure or function of the market …. leading to increases in the adoption of energy-efficient products, services and/or practices*". A more commonly accepted modern definition of market transformation is "*a reduction in market barriers resulting from market intervention, as evidenced by a set of market effects, that lasts after the intervention has been withdrawn, reduced or changed*" (Eto, Prahl and Schlegel 1998[4]).

Since the early 1990s, numerous initiatives have been implemented worldwide. Market transformation has become a preferred policy approach to energy efficiency in the United States, Europe, Japan, Australia, and also in transition or developing countries (Brocklehurst and Klinckenberg 2005)[5]. Water and waste are two other areas where policy instruments for market transformation may be applied to achieve lasting environmental improvements of products or services[6, 7].

In addition to actions by national governments, international donors and financial agencies such as the International Financing Corporation (IFC), World Bank, Global Environmental Facility (GEF), or United Nation Development Programme (UNDP) are also active in advocating for or funding market transformation programmes. Other organisations such as the International Energy Agency, International Institute for Energy Efficiency, World Green

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[3] Nadel S, Thorne J, Sachs H, Prindle B and Elliott RN 2003. *Market Transformation: Substantial Progress from a Decade of Work.* Report Number A036, Washington, American Council for an Energy Efficient Economy.

[4] Eto H, Prahl R and Schlegel L 1996. *A Scoping Study on Energy-Efficiency Market Transformation by California Utility DSM Programs.* Berkeley, Lawrence Berkeley National Laboratory.

[5] Brocklehurst F and Klinckenberg F 2005. *Comparison of UK and Best International Energy Standards.* UK Market Transformation Programme, Future Energy Solutions from AEA Technology, and Klinckenberg Consultants.

[6] Market Transformation Programme: Supporting UK Government Policy on Sustainable Products. See www.mtprog.com/Background.aspx.

[7] Water Efficiency Labelling and Standards (WELS) Scheme. See www.waterrating.gov.au/.

Building Council (present in six countries and expanding in nine others) play important roles in systematically studying market transformation initiatives, setting standards and labels, designing certification systems and so on.

In recent years, the scope of market transformation has been extended to encompass the sustainable consumption and production agenda which was one of five platforms of action promoted at the World Summit on Sustainable Development held in Johannesburg in 2002. A 10 year framework of international programmes was initiated to accelerate the shift towards sustainable consumption and production[8]. Sustainable consumption and production is the focus of the UK Government's Market Transformation programme and is defined as:

A major shift to deliver new products and services with lower environmental impacts across their life cycle, while at the same time boosting competitiveness. And the need to build on people's growing awareness of social and environmental concerns, and the importance of their roles as citizens and consumers. (Securing the Future 2005[9])

Events like the annual summer schools organised by ACEEE[10] and ECEEE (European Council for an Energy Efficient Economy)[11] and, most recently, the first conference of the Sustainable Consumption Research Exchange (SCORE)[12] also help to advance the market transformation concept and provide a platform for sharing the learning of various approaches.

For the literature review part of this study, we looked at the development of market transformation as a concept, examined several initiatives that have occurred internationally in recent years, the interventions employed and their expected or real impact. Some of the initiatives reviewed were found to have had clear success in transforming the market, while others were still a long way from that. We also explored success factors as well as the most common challenges and reasons for failure. However, the study is not intended to, and cannot, provide the recipe for success for a transformation programme given the numerous factors that can influence a programme's design and performance. Documenting market change remains a challenge. Processes for evaluating progress in market transformation are also investigated as means for effective management of any transformation programme (from design to implementation).

3.2 Market transformation theory

Effective transformation happens through pressures (or interventions) that pull and push the market simultaneously: consumers request energy efficient products and suppliers are motivated to provide them (market-pull); or, suppliers influence consumers' behaviour by providing energy efficient products (market push). Consequently, any interventions in the marketplace should be based on a sound understanding of the market (demand and supply), its structure and performance, and specific players (from energy generators and distributors to traders, intermediaries and final consumers). Experience so far demonstrates that key players in the market show greater support for transformation programmes when their

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[8] Sustainable Consumption and Production (SCP) Initiatives, United Nations Department of Economic and Social Affairs (DESA) and United Nations Environment Programme (UNEP). See webapps01.un.org/dsd/scp/public/Welcome.do

[9] *Securing the Future: The UK Government Sustainable Development* Strategy 2005. London, The Stationery Office. P 43.

[10] American Council for an Energy Efficient Economy. See www.aceee.org/

[11] European Council for an Energy Efficient Economy. See www.eceee.org/

[12] Sustainable Consumption Research Exchange (SCORE). See www.score-network.org/

concerns and motivations are considered in the design of the intervention (Nadel *et al* 2003[13]).

Because of the need to go beyond understanding of the demand-side in the design of an effective market transformation programme, theory-based approaches have been applied to help maximise the learning and support the advancement of market transformation initiatives.

Such learning processes enable changes in market transformation practice; however, they are not sufficient to ensure the ultimate sustainability of the market transformation initiative. That is why theory-based approaches are recommended to better anticipate market challenges and potential risks in achieving lasting changes (so called 'ex-ante' evaluation[14] to predict likely market effects). Unlike demand-side management, use of programme theories (Chen 1990)[15] in market transformation go beyond quantifying (energy) savings and costs to include the broader benefits of market change (i.e. non-energy benefits, change in consumer behaviour, adoption of new technologies).

A theory-based approach to market transformation was put forward by Blumstein *et al* 1998[16] emphasising the importance of understanding market dynamics to develop plausible programme theory. The Californian Energy Commission (CEC) was among the first to explore the use of programme theory to identify opportunities, design and pilot interventions, and test assumptions in market transformation programmes. At the core of their approach was a continuous learning process and real-time feedback required for effective market transformation interventions.

3.3 Policy instruments and measures for changing markets

The main purpose of any market transformation programme is to change the way the market operates and correct its failures or remove barriers. Policy instruments and measures need to be designed with this goal in mind. The International Energy Agency specifically recommends removing or reducing barriers to market developments that are a result of market failures. For this reason, a first step in designing an intervention is to identify and collect the data that demonstrates the market failure. A broad grouping of the reasons for failure in energy markets was suggested by Sebold *et al* (2001[17]) following economic efficiency thinking:

- **Externalities** – when the consumption or production of products or services results in costs or benefits to consumers or companies not directly involved in the

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[13] Nadel S, Thorne J, Sachs H, Prindle B and Elliott RN 2003. *Market Transformation: Substantial Progress from a Decade of Work.* Washington, American Council for Energy Efficient Economies.

[14] Ex ante evaluation – forward-looking assessment of the likely future effects of new policies or proposals.

[15] Chen H-T 1990. *Theory-Driven Evaluations*. Newbury Park, CA: Sage Publications.

Chen describes programme theory as "a specification of what must be done to achieve the desired goals, what other important impacts may also be anticipated, and how these goals and impacts would be generated". Chen makes the distinction between two phases in programme theory; 1) normative theory, which provides the rationale and justification for the programme structure and activities, and 2) causative theory, which represents the empirical knowledge about the causal relationship between the intervention and the outcome.

[16] Blumstein C, Goldstone S, Lutzenhiser L 1998. *A Theory-Based Approach to Market Transformation.* Proceedings of the American Council for an Energy Efficient Economy. Washington, ACEEE Press.

[17] Sebold FD, Fields A, Skumatz L, Feldman S, Goldberg M, Keating K and Peters J 2001. *A Framework for Planning and Assessing Publicly Funded Energy Efficiency*. Study PG&E-SW040. San Francisco, Pacific Gas & Electric.

consumption/production of that product or service. For example, environmental damage is considered an externality when it is not included in the price of the product/service. Environmental externalities is a common justification for market interventions.

- **Imperfect information** – a perfect market implies that information is flawless and costless. This is not the market reality. Some of the problems related to information are accuracy, how much it costs to get it or ability to do something with the information. For example, labeling is a way to provide information to consumers, yet past experience shows that information has not always been reliable (the case of self-claims) and consumers may choose not to buy a better product since they don't trust the label or are confused by the choice (e.g. in Germany, all new refrigerators now have an A energy rating and consumers do not understand the A+ to A++ labelling). Another example is the case of new technologies, when incomplete information is provided (sometimes for competition reasons).
- **The product or service is a public good** - the case when the benefits of providing a product or service cannot be limited only to the consumer or company procuring it, others benefiting at no cost – hence the market failure. Research falls under this category, especially when the results are not protected by patent or copyright. Under investment in research is believed to be a result of this shortcoming (Golove and Eto 1996[18]).
- **Imperfect competition** – the case of markets where there is one or a limited number of sellers and large number of buyers, or the other way around. Monopoly is such example of market structure.

In energy efficiency markets, barriers are considered examples of specific market failures, features of the energy market that prevents investment in energy efficiency (Golove and Eto 1996). They can include lack of awareness or knowledge, split incentives (the case when purchaser is different than the user of products i.e. owner *versus* tenant), energy price distortions, and lack of or limited access to capital (the case of low-income households or businesses).

In general, several policy options and measures have been used in international programmes to address market barriers (see Table 2):

- labels and standards
- technology procurement and innovation
- financial incentives
- information provision.

Because of the complexity of markets and high number of players (as in the case of housing industry), no single measure or instrument can achieve a sustainable change of the market. Consequently, any intervention programme involves a mix of instruments to achieve a set

[18] Golove W and Eto H 1996. *Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency.* Berkeley, University of California.

goal. For example, the Japanese Top Runner programme[19] sets mandatory energy efficiency standards in cooperation with manufacturers (race to the top approach), and relies on the existing public green procurement law to create the initial market demand and support the penetration of superior products on the market.

[19] Energy Conservation Center, Japan, Top Runner Programme: Developing the World's Best Energy Efficiency Appliances. See www.eccj.or.jp/top_runner/index.html

Table 2 Overview of some of the policy instruments and other measures used in market transformation

Type of instrument	Explanation	Things to be considered
Standards and labels	Standards are typically used for individual products (i.e. minimum performance/efficiency standards) with the aim to eliminate obsolete products or bring into the market more efficient ones; they are usually used in conjunction with labels which is the interface with consumer. Standards target supply (manufacturers) while labels are demand-side measure (consumers). Standards for buildings include Energy Star Homes (USA) LEED (USA), BREEAM (UK), EnerGuide for Houses Retrofit Incentive Program (Canada); Nationwide House Energy Rating Scheme (NatHERS) (Australia)	• In case of buildings, energy efficiency seems to be at the core of the standards or rating systems, perhaps a result of years of government and utility programmes promoting energy efficient products. • Compliance with standards seems to be a problem - adequate resources and training for building inspectors and surveyors should be considered. • Labels work if consumer knows them – awareness campaigns/information for consumers • Energy efficiency product label in EU (A+, A++) created confusion as the standards improved, consumers not differentiating which product was better
Voluntary industry agreements/ Codes of Practice	Essentially a contract between government and industry to meet negotiated targets within a set timeframe. The advantage is the flexibility and non-prescriptive way of meeting targets, long-term outlook and high potential in changing behaviour and promoting technology innovation. Codes of Practice are less formal, relaying on self-commitment of industry and internal monitoring and reporting. Examples of voluntary agreements include the European Green Light Programme, or Energy Star New Homes Sampling Protocol in the USA. Sweden launched the Programme for Improving Energy Efficiency in Energy-intensive Industries, for which industry is invited to enter agreement with government in exchange for tax exemption. Netherlands has Long Term Agreements with industry associations to increase energy efficiency.	• Commonly used for improving the performance of environmentally mediocre or poor industries • Well-thought out voluntary agreements include compliance mechanism • Although mostly non-regulatory approach, implementation can involve significant administrative work (do the costs match the benefits?)

Type of instrument	Explanation	Things to be considered
Technology Procurement	Demand side instrument usually non-regulatory, though public procurement legislation creates enabling conditions for sustained buyer demand. The USA Federal Government used procurement policies very successfully in several areas (computers/printers-Energy Star label). USA power utilities also used procurement to promote energy efficiency. Sweden also has large experience in technology procurement (i.e. house appliances) as a tool for changing the market. EU SAVE Programme and UK's Market Transformation Programme also addresses procurement in their studies.	• Possible players: utilities, housing and public agencies, government purchasing agencies, housing operators • Requires thorough understanding and interaction with buyers and sellers (manufacturers) • Buyers' interest is difficult to gain in case of technology that has not been developed yet ('chicken and egg' problem) – the credibility and credentials of the broker organisation between buyer and seller (from experience of Swedish Agency for Economic and Regional Growth, NUTEK) and the design of the technology procurement process is therefore very important. This is relevant for Beacon, who might play such brokerage role in a market transformation programme and needs to develop a long and trustworthy relationship with buyer groups. It took several years for NUTEK to gain positive results with their initial procurement programmes. • Government agencies can take the lead - social housing sector can be a potential area to start with. The first experience of NUTEK with technology procurement in Sweden in 1989. Started with creation of a buyer's group interested in energy-efficient refrigerators (see comments under Research and Development). The group was formed by public and commercial housing groups making up about 40% of the market. Similar approach was followed in US by the NY City Housing Authority who cooperated with New York Power Utility to equip social residential buildings with apartment-sized energy efficient refrigerators. Social housing is also used in Ireland and UK as driver for change in procurement. • Non-energy benefits (i.e. reduced noise, longer product life, increased safety, less maintenance) are very important factors in buyer's decision – they should be sought and incorporated into procurement specifications. • Since a house is a complex product (or system), experience so far suggests that it is easier and preferable to design procurement programmes that target simple components (windows, appliances) or systems (heating and air conditioning)

Type of instrument	Explanation	Things to be considered
Financial incentives	Comprises broad range of tools: subsidies, rebates, tax reductions, grants (especially for R&D), low-interest or guaranteed loans, targeting both demand and supply and redistribution of environmental charges. There are complex interventions to design, since price is not the only barrier. Successful examples include WashWise (US Northwest Energy Efficiency Alliance), the UK's Sustainable Energy: Energy Efficiency Commitments, or the more recent Energy-Efficiency Home and Vehicle Tax Credits in USA. In Netherlands, the Energy Regulatory tax goes into an Energy Premium Scheme which provides rebates for appliances, office equipment, insulation, renewable energy and home energy audits. Denmark's wind turbine investment subsidy, electricity tax repayment and funding for research and development in wind technology – the subsidy was for privately owned wind turbines that now represent about 80% of the installed capacity, Germany's resource tax on water, taking into account environmental externalities. Interventions relating to the redistribution of environmental charges include: Germany promotes 'clean' gasoline by charging users of leaded gasoline and redirecting these flows to unleaded users. Saskatchewan runs a deposit-refund scheme on beverage containers that is also one of Canada's largest employers of physically disabled people. Sweden reduces emissions of nitrogen oxide (an atmosphere-warming gas) by requiring its dirtiest energy producing firms to compensate cleaner producers. The UK transfers disposal cost savings from recycling to groups responsible for collecting waste	• Subsidies and rebates often not effective in achieving market transformation but temporarily increasing the availability of a product during intervention. Many studies recommend taxes (and standards) as more effective instruments than subsidies, with spill-over effects such as technology development. • Operation of a subsidy scheme involves high level of administration (hence costs), including monitoring after the subsidy has been closed. It is recommended that subsidies are related to the amount of energy (or other resources) savings realised, so that the scheme is effective and efficient. General experience with subsidies in EU is that they have limited effect but are more politically acceptable than taxes and other type of charges. • While not so acceptable politically, taxes are generally easier to administer than subsidies, and are also more likely to trigger technological innovation as businesses are motivated to reduce their impact and corresponding tax (the case of Energy Tax in EU and the motivation for energy efficiency). • In markets where energy/resource efficient products are promoted by expensive brands, equity/distributional issues need to be considered into the design of subsidy schemes. Since expensive brands are usually bought by the wealthy segment of population, the risk in such case is a de facto transfer of income from general tax payers to higher income earners. • Free rider risks in case of subsidies can be high. Research in Germany and Netherlands on the impact of subsidies on sales of condensing boilers showed free rider rates of up to and over 50% • The Tax Incentives Assistance Project provides detailed information on various energy tax incentives in US. • Products or systems targeted by subsidies should be carefully identified. Products or systems targeted by subsidies should be carefully identified. In Denmark, subsidised are offered for improving the energy efficiency of dwellings inhabited by low-income pensioners. The reason for this was an investigation which pointed out to the high heating bills that they generally had. The subsidy covers up to 50% of the investment cost but not more than $US3,600.

Type of instrument	Explanation	Things to be considered
Information dissemination and education	Common instrument used in conjunction with most MT instruments. Can target demand (awareness raising campaigns/advertisements) or supply (advertisement campaigns and demonstrations for new technology/practice, training and technical assistance).	• Consumer awareness of Energy Star Homes label is an important component of the Energy Star Homes Program. Although the programme was successful in attracting builders to sign up for certification and educate them in selling energy efficient homes, EPA was forced to focus on outreach activities for consumers when the number of certified houses started going down. • A shortage of skilled builders is a common problem in the housing market everywhere. Thus opportunities for training needs should be clearly identified. • The EU's Energy Performance of Buildings Directive requires that from 2006 each EU member states puts methodology in place for providing information on the energy performance of all buildings when built, sold or rented. This initiative is seen as an enabling instrument for consumers to make informed decisions.
Research and Development	Instrument used often in conjunction with procurement; it targets mostly supply to stimulate new technology and design, and influence manufacturing.	• Common approach is that utilities or government agencies or house owners associations pool together funds which are competitively offered to manufacturers to develop a better product (i.e. more energy efficient). In case of Swedish Energy Efficient Refrigerator, the offer for the winning manufacturer included a guarantee to purchase large number of refrigerators by a combined group of large purchasers. A similar initiative in US (super efficient refrigerator program) only guaranteed a solid strong promotion and rebates for energy efficient refrigerators produced. • See also comments under technology procurement

Type of instrument	Explanation	Things to be considered
Building codes/Rating systems for buildings	Building codes primarily apply to new constructions and can have a closing function in the market transformation process (sustainable practices are already accepted in the market place and the code makes them mandatory). Rating systems include: Energy Star Homes, LEED.	• Requires sound enforcement system (the case in NZ now after the leaky building syndrome); down side is that it may have a minimal approach since requires political consensus and is only relevant for new buildings (or those going through major retrofitting). • Codes need continuous review to reflect the development of new materials/technologies/practices and as necessary climate change, otherwise they can become a barrier against adoption of better practices. Research in US shows that although building codes are intended as thresholds, they are in fact ceilings for the industry which rarely goes beyond the code. • In Australia, the Building Code now includes energy efficiency measures for houses. Some states went as far as to ask for an Energy Efficiency Rating (EER) Statement for all houses put on the market (ACT); Victoria requires that all new houses built meet a 5 star energy rating for the building fabric, or 4 star for the building fabric combined with rain water tank or solar hot water system. Green mortgages are available.

The recently launched 40 Percent House programme in UK[20] proposes labelling, minimum standards, procurement and rebates as tools to help achieve a 60% reduction in carbon dioxide emissions in the housing stock by 2050.

Both the European Union and United States have used energy labelling with success as one of the first policy instruments for market transformation. The United States launched the Energy Star[21] voluntary labelling programme in 1992, focusing on computers and monitors. The labelling programme now encompasses over 40 product groups, with government procurement policies giving priority to approved products. Also in 1992 the European Union launched the Energy Label[22]. This led to an effective transformation of the European appliance market, particularly cold appliances for which the average efficiency improved by 30% by 2005. Both approaches rely on public procurement policies in favour of energy efficiency products and also use incentives and rebates to ensure the sustainability of the market effect. Additionally, in both cases, sustained awareness campaigns helped familiarise and build consumer trust in the labels.

3.4 Factors that influence market interventions

According to market transformation theory, market interventions are "*deliberate efforts by government or utilities to reduce market barriers and thereby change the level of investment in energy efficiency*" (Eto, Prahl and Schegel, 1996). Note that it is only recently that market transformation theory and practice has begun to be applied to areas such as water and waste. Traditionally governments' tax-payers funds and utilities' rate-payers funds are used in the design and delivery of market interventions. Varone and Aebischer (1998)[23] studied policy interventions implemented in five national strategies (Canada, Denmark, United States, Sweden, Switzerland) and concluded that the choice of instruments used to intervene in the market must consider all stages of the product's life cycle i.e. whether they directly influence the production, distribution, marketing and/or the end-use of the product. They concluded that two main categories of factors can influence the choice of instruments: political-administrative and technical-economic.

Varone and Aebischer (1998) identified four fundamental attributes or valuation criteria of policy instruments by which political and administrative actors evaluate and choose policy tools:

1. resource intensiveness, defined in terms of administrative operating costs
2. targeting, defined in terms of how precisely and selectively policy instruments target recipients of potential benefits and costs
3. political risk, defined in terms of public visibility (of policy failure) and of potential impacts on voters

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[20] Environmental Change Institute, University of Oxford, 40 Percent House: The 25 Million Home Makeover. See www.40percent.org.uk/

[21] US Environmental Protection Agency and US Department of Energy, ENERGY STAR. See www.energystar.gov/

[22] Green Labels Purchase, EU Energy Labelling. See www.greenlabelspurchase.net/l-eu-energy-labelling.html

[23] Varone F and Aebischer B 1998. *From National Policies to Global Market Transformation: The Challenges of (International) Policy Design.* Laussane , Institute for Advanced Studies in Public Administration.

4. constraints on state intervention, defined in terms of ideological and financial constraints on the respective role of government and private market.

This implies that policy interventions must recognise the groups of the concerned actors together with their economic and political power.

Varone and Aebischer (1998) showed that choice of instruments is also influenced by technologies and by the market structure. For example the market for office equipment is significantly different from the market for household appliances, with respect to the degree of globalisation, the innovation cycle and the life time of equipment. Whereas office equipment operates in a global market, the electrical appliances market is always national and/or regional. Consumer needs and consumption patterns are very different between national markets and no integration or important trading happens between them. However, it is possible to induce market transformation through international cooperation e.g. the adoption of the ENERGY STAR label in the USA, Europe, Japan and now in New Zealand.

Interventions that neglect political and administrative institutions and actors may lead to instruments that are not accepted and not implemented. On the other hand, interventions that conform to existing institutions but ignore overseas market knowledge and experience may have reduced potential to induce change.

Effective market transformation interventions in the energy efficiency field, offer high non-energy benefits, low incremental costs relative to standard alternatives, and relatively simple market structures. For a product to gain market acceptance, consumers have to be satisfied with its performance, which means it has to perform at least as well, and probably better than, existing products (Suozzo and Nadel, 1996)[24].

3.5 Designing market transformation programmes

In a comprehensive review, Meyers (1998)[25] drew on market transformation programmes in the USA and other industrialised countries to develop a framework for market-oriented strategies for improving energy efficiency. The following account has been summarised from that paper.

Most market transformation programmes involve multiple market actors, such as:

- entities participating in a product's distribution chain (manufacturers, distributors, retailers, energy service companies)
- entities responsible for specifying targeted products (contractors, engineers, builders, industry associations)
- organisations responsible for implementing the programme (utility companies, advocacy groups, special coordinating organisations)
- brokers/facilitators with knowledge and breadth of contacts (government agencies, industry associations)
- promoters (utilities, government agencies, advocacy groups, manufacturers and retailers).

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[24] Suozzo M and Nadel S 1996. Learning the lessons of market transformation programmes. American Council for an Energy Efficient Economy *Summer Study on Energy Efficiency in Buildings* 2:195-206.

[25] Meyers S 1998. *Improving Energy Efficiency: Strategies for Supporting Sustained Market Evolution in Developing and Transitioning Countries.* Ernest Orlando Lawrence Berkeley National Laboratory, Report Number LBNL 41460.

Market barriers on both the supply and demand sides must be addressed to produce permanent change in a market. Six types of measures that can promote sustained evolution of markets toward improved energy efficiency are:

(1) Improving information about energy efficiency opportunities

(2) Financing of energy efficiency investments

(3) Financial incentives for energy efficiency investments

(4) Minimum efficiency standards

(5) Market aggregation and technology procurement

(6) Voluntary commitment and recognition.

Properly designed and implemented, these measures can help to transform markets so that decisions that favour higher energy efficiency will be made to a greater degree in the future without incentives or other interventions in the market. Market-building policies are of critical importance in creating an environment in which market transformation measures can be effective and have sustained impact.

The key elements of the market transformation process are:

- end users need to demand greater efficiency and improved performance as a result of increased awareness and knowledge; their interest and purchasing commitments would eventually create critical-mass market participation.
- the markets for more efficient and better performing products and services created through the purchasing commitments of users would provide clear business opportunities and incentives for designers, manufacturers, and distributors to proactively participate in developing, promoting, and selling new products and services.
- the suppliers of products and services who are capable of responding would be rewarded in the market.
- users and suppliers of products and services who are not yet participating in the market would be exposed to new information, norms, and competitive pressures and may become new market entrants.
- changes in market structures and in the behaviour of market players would persist as dynamic, lasting improvements in the market.

Using the example of energy efficiency, market transformation programmes, typically:

- have the potential to achieve very large energy savings relative to traditional energy efficiency programmes, but take more time to achieve results.
- create a set of conditions under which the self-interests of key actors will be aligned and oriented toward achieving greater energy efficiency (use market forces to achieve energy efficiency).
- often link energy efficiency with other product or service attributes that are of value to the end user (i.e., are focused on meeting consumer needs).
- involve and depend to a significant extent on voluntary cooperation of a range of market actors.
- look for opportunities where there is momentum in the market for the targeted or related changes.

Key factors that sustain market transformations include product and service marketability, product and service availability, information management and technology access, availability

of expertise, stakeholder benefits, behavioural and attitudinal change, and tracking and evaluation.

3.6 Market transformation in the housing industry

Since the 1970s, most OECD countries have introduced numerous measures to improve the energy efficiency and, more recently, the sustainability of buildings. These measures include:

- mandatory energy efficiency building codes to supplement older codes for structural strength and fire safety
- tax incentives, subsidies and low-interest loans for builders who go beyond the regulatory standards
- information and technical assistance to encourage builders and buyers to adopt more energy-efficient practices.

OECD countries generally began by introducing energy-efficiency codes for each building element, including windows, walls, roofs, and systems for space heating, water heating, ventilation and air conditioning. Some countries have since introduced overall building performance standards, taking into account the components and other factors, such as passive solar heating from building orientation and design.

In the United Kingdom, electricity and gas suppliers are required to assist customers in improving energy efficiency through low-cost methods, with a particular focus on low-income households.

In Denmark, the United States and other countries, building owners have been able to request free energy audits with recommendations for cost-effective energy efficiency measures. Surveys indicate that the majority of households participating in such programmes have undertaken at least some of the energy conservation measures recommended.

In the United States, some states and communities have passed Residential Energy Conservation Ordinances (RECOs) requiring existing buildings, when sold or renovated, to have some basic low-cost energy-efficiency measures such as insulation, weather stripping and caulking.

From 2002, Germany began to require energy efficiency measures in existing buildings, including replacement of old boilers, insulation of attics, and insulation of pipes in unheated rooms.

Some countries have introduced incentives for buildings that perform better than regulatory standards. In Canada, for example, the Commercial Buildings Incentive Program offers subsidies for investments in energy efficiency based on projected annual energy saving. In other countries, tax credits have been used for the same purpose. Analysis of such approaches suggests that subsidies at the design and construction stage have substantially greater impact on building performance than incentives based on operating costs, such as energy taxes.

The EU Energy Performance of Buildings Directive (2002/91/EC) requires an energy certificate to be issued at completion of construction, point of sale or rental. Some countries, such as the United Kingdom and Denmark, have introduced mandatory labelling of the energy efficiency of buildings. The UK 2006 Building Regulations set performance requirements and propose that whenever money is spent on renovation not related to energy efficiency, an extra 10% of the total cost must be spent on upgrading energy performance.

3.7 Summary

A market transformation programme with the goal of improving the sustainability performance of housing is likely to require a mix of instruments that include policy interventions, economic incentives, monitoring and evaluation. Measures are needed to create both “supply push” and “demand pull”. Supply-side approaches include requirements for suppliers to improve product design considering all stages of the product’s life cycle, performance and quality; minimum standards, labels and building codes. Demand-side approaches include education of consumers and professionals; incentives through finance or voluntary schemes, home performance audits and reporting.

4. MARKET TRANSFORMATION IN THE NEW ZEALAND CONTEXT: DRIVERS AND BARRIERS

4.1 Previous Beacon research on market transformation in New Zealand

An understanding of the New Zealand context is important in considering how market transformation could improve the sustainability of New Zealand housing. A number of Beacon research reports have explored issues of relevance to market transformation in New Zealand. These reports provide the context within which the interventions work reported here was conducted.

This section provides an overview of previous Beacon market transformation research findings. These are divided into industry and consumer research. Where relevant, the drivers for, and barriers to, improving sustainability in the New Zealand housing market are highlighted.

4.2 Industry research

IND 1 Industry Research Impacts and Alternatives

The IND1 report (Smith, McNicol, Finlay 2004) developed a conceptual "tube map" of the housing industry (see Appendix A), which identified market players and decision points in the industry. The map was developed through a review of housing industry involvement in sustainable development initiatives and a workshop involving 30 public and private representatives from a wide cross section of the New Zealand housing industry. The tube map identified 10 sector "lines", with decision points which in some cases intersected at "junctions", or critical decision making points that represent relationships between different groups in the New Zealand housing industry value chain. The sector lines are:

- Finance
- Design
- Component
- Purchase
- Life
- Education
- Market Feedback
- Regulation
- Demolition
- Long Term Planning.

The report found that interventions to influence the housing industry will work best at the critical decision making points. For example, an intervention at the "vendor" junction between the purchase and design lines could be including environmental criteria in the specifications for materials to be purchased. In summary, the report found that:

- Planners, designers and regulators could influence demand
- Lenders, insurers, developers and estate agents could create market supply
- Education, training and qualifications could influence supply
- Manufacturing companies are likely to adapt quickly to delivering more sustainable products provided that the market is there

- Awareness raising, interventions and performance indicators need to be specifically tailored for each of the dominant player groups
- Sector bodies for each of the dominant player groups may provide an efficient route for awareness raising and developing appropriate performance indicators.

IND1 also made a high-level assessment of current and likely future capacity of the New Zealand housing industry to deliver sustainability outcomes. The report found that current knowledge and practice in the New Zealand housing industry for delivering sustainability outcomes and solutions were limited, and largely aimed at reducing environmental impacts. Few initiatives engaged with the refurbishment and renovation industry. The implications for the New Zealand housing industry of delivering sustainable housing solutions are outlined in Table 3 below. These implications could also be seen in terms of barriers and opportunities for improved sustainability in the housing market.

Table 3: Implications for New Zealand housing industry of delivering sustainable housing solutions

Key implication	Detail
Collaboration at design stage	Delivery of sustainable solutions should be a collaborative process involving all the key industry actors and should take place at the planning and design stage for both new and retrofit housing projects
Fiscal incentives and rating schemes	These tools should be added to current practices. Tools should be reinforced by post-project evaluation to demonstrate that sustainable outcomes had been achieved
Resources for education	More resources are needed for awareness raising, education and training within the housing industry
Trade qualifications	Qualifications should be developed for a wider range of trades operating in the housing industry, there should be ongoing responsibility for the work and there should be an independent inspection process to check the quality of the work
Mainstreaming sustainability	To promote sustainable solutions throughout the housing industry, the terms 'sustainability' and 'green' need to be rebranded to link their values with more mainstream consumer interests; for example: good design, comfort and affordability with minimum impact on the environment.

MT 101 – Housing Industry Association Alignment

This research aimed to assess the alignment and commitment to the Beacon goals by housing industry associations across the range of housing industry sectors (Smith,

McKernon, McCartney 2005). It found that industry associations are involved, on behalf of their members, in sustainable development at many levels. For some sectors, for example research, waste management and design, sustainability was found to be a key driver across their goals and activities. In other sectors, for example manufacturing, consumers and infrastructure sectors (such as planning/legal and education), sustainability is emerging as a driver. The groups not yet prepared for sustainability are sales/valuation, construction, fixtures and fittings and finance.

Within the housing sector, industry associations are interdependent and the adoption of new practices by one group can have implications for all the functional groups across the entire sector. The report suggested that leveraging groups that already see the value of sustainability to their industry may create change in other parts of the housing value chain. Beacon sees its role as helping industry associations to respond to sustainability challenges by assisting industry associations define sustainability for the sector, helping bridge knowledge gaps and helping industry associations build capacity to meet these challenges.

MT 104 – Market Transformation Housing Industry Survey

A survey to assess the level of knowledge and uptake of sustainability practices within the housing industry was responded to by 86 companies in the sector (Marquardt, Stancu, Gunn, 2007). An overall finding was that the level of engagement in sustainability practices in the housing industry is relatively low.

A section of the survey was designed to obtain respondents' views about barriers to, and drivers for, the uptake of sustainability practices in the housing industry.

Lack of consumer demand was singled out as the major barrier, with over a third of survey respondents considering this to be the main obstacle to uptake of sustainable housing. The three other key barriers that were identified were on the supply side of the industry: Higher cost of products/services with good environmental performance in relation to standard products/services, lack of information on the costs and benefits of more sustainable products/services and lack of supplier/contractor/trades persons' skills or knowledge of more sustainable products/services.

In terms of the importance to respondents of particular areas relating to sustainability, energy conservation and efficiency were of most interest, followed by the health and well-being of house occupants, health and safety of housing workers and the use of materials from sustainable sources.

The key drivers identified as having potential to stimulate the adoption of sustainable practices were: demand from customers, financial incentives (eg tax relief on investments to improve environmental performance) and regulation and/or environmental performance standards for houses.

The key drivers identified as having potential to stimulate higher demand from customers for sustainable products and services were: financial incentives for improving the environmental performance of the house, public information on the benefits of products/materials/services with good environmental performance, regulation (eg information about the environmental performance of the house has to be provided at the point of sale) and competitive costs for products/materials/services with good environmental performance.

MT 111 – Exploring a Commercially Viable Model for Retrofit

This review of existing retrofit programmes in the New Zealand market (Hargreaves 2005) concluded that there are a number of commercial companies operating in the retrofit market. Most provide services through grants and subsidies to low-income households and focus on energy aspects of homes. Given that Beacon sees middle to high-income earners as key

customers and has interests wider than energy, there is room in the market for Beacon to further promote sustainability retrofitting. However, a key barrier to moving beyond low-income and energy is that most of the commercial models rely on government funding to some degree.

The report proposes that there is scope for a commercially viable retrofit model that focuses on all households and broader sustainability goals. Key features of the commercial model proposed included:

- focus on middle to high-income households
- increase the services offered beyond energy. Beacon could offer some financial or logistical support to encourage this transition
- up-to-date market analysis to determine what retrofit packages could be offered, in alignment with New Zealand's DIY culture and willingness to pay issues
- commercial model would benefit from a 'green mortgage' assistance package to incentives homeowners to retrofit.

The report identified further issues to be explored, including Beacon considering how to ensure there was a rating tool at point of sale for houses.

4.3 Consumer research

Two surveys of consumer knowledge and uptake of sustainable solutions have been carried out for Beacon. One was a qualitative survey (MT102) (McKernon 2005), the other a quantitative survey (MT103) written up in a currently unfinished report. The surveys aimed to understand the:

- level of consumer uptake and demand for sustainable technologies and solutions
- problems faced by householders who have attempted to adopt more sustainable technologies and solutions.

MT102 – Consumer Survey: Qualitative

Through a range of in-depth interviews, the qualitative survey found that:

- people are generally unaware of sustainability and do not associate it with better quality of life in the home. Sustainability is tangential to mainstream aspirations for the home
- people are doing very little with sustainability as it holds minimal emotional and practical appeal. Sustainability improvements are split into small projects to spread workloads and budgets over time, but householders fear spending money that cannot be recovered on resale
- sustainable housing is perceived as not offering the key advantages people want in their experience of a home - a home that makes them feel at ease, comfortable, relaxed, healthy and able to enjoy themselves, a home they experience as spacious, well-designed, warm, dry and easy to change/renovate.

The report recommended that the Beacon definition of sustainability be "re-invented" to align with the concept of liveability (that home is the way that the householder aspires to live in the house) and the benefits sought from a home (emotions - ease, comfort, enjoyment, relaxation; experiences – spaciousness, solidity, year-round warmth dryness and comfort).

A key theme relating to barriers to improved home sustainability was that respondents were often concerned that making improvements, such as insulation and double glazing, would be

"invisible" to prospective buyers and they would not recoup their financial investment. A number of respondents could see the value in making sustainability improvements, but would be prepared to do so only on higher value homes, which they intended to live in for a longer period.

MT103 – Consumer Survey: Quantitative

The quantitative survey asked respondents about a number of "sustainability features" installed in their homes (eg insulation, low water-use fittings) and those they were considering installing in future. Respondents were drawn from subscribers of Consumer Magazine and tended to be from an older age-group and have a higher disposable income than the general population. The survey findings should therefore be seen as representing a group more likely to have the resources to adopt existing and new technologies for their homes should they wish to do so.

The most commonly installed sustainability features were found to be those that will improve energy efficiency and warmth in houses, and that can be done by the householder themselves at relatively low cost (eg energy-saving light bulbs, extractor fans, hot water adjusted to 60°C) or where the benefits and pay back are well understood (eg dual flush toilets and ceiling insulation). High cost energy efficiency features (eg solar water heating, double glazing) are installed in low numbers. Similarly, water efficiency features are installed in low numbers, apart from those that are low cost or result from market promotion and availability in recent years (eg dual flush toilets).

In terms of planned sustainability improvements homeowners were found to have different priorities to renters. Homeowners favoured improvements that cost little (eg cylinder wraps) or where the benefits and pay back are well understood (heat pumps and solar water heating). Renters favoured higher cost additions and installations (eg solar hot water, extractor fans, underfloor insulation).

The most important features of the house were found to be winter warmth, and that the house is well built and low maintenance. The most important features for living in the home were found to be comfort, privacy and security.

4.4 Summary of Beacon's market transformation research

This section draws together common themes emerging from Beacon's market transformation research to date, highlighting barriers and drivers for improved home sustainability in the New Zealand context.

An important theme is consumer concern about the cost of improving the sustainability of their homes. Consumers and industry made little mention of the cost of common or required sustainability-related features in newly-built homes (eg insulation, dual flush toilets). However, the up-front cost of retrofitting sustainability features and the perception that those costs would not be recouped on sale of the property are key concerns for consumers. This appears to limit the extent to which consumers consider making improvements for sustainability purposes. Currently consumers are most interested in low value and effort modifications.

The limits on consumer demand arising from perceived cost may be exacerbated by a lack of information on the benefits of sustainability features in terms of providing a more comfortable home, which is cheaper to run over time, and payback periods for particular improvements.

From the industry perspective, stronger consumer demand for sustainability solutions is seen as the key driver to develop the market in this area. Industry perceives this as being strongly linked to the cost of sustainability-related products and services, information on those items and the ability of industry to provide them. Financial incentives and regulation requiring better

environmental performance of houses are seen as key drivers to stimulate both industry uptake of sustainability practices and higher consumer demand for sustainability solutions.

These themes, taken together, can be seen as a self-perpetuating cycle with lack of consumer demand resulting in few drivers for reduced costs, better information or improved industry capacity. A “circuit-breaker” may be required to break this cycle at some point. Recent Government announcements about improved energy efficiency requirements for new homes may improve market conditions with possible flow-on effects into the retrofit market. For example, increased demand for double glazing may drive down cost, lead to quality improvements and “normalise” double glazing to the point that homeowners can see the benefit of installing double glazing even where this is not required by regulation.

A commercial retrofit model aimed at middle to high-income households was suggested in MT111, which could have the effect of increasing consumer demand. However, the level of uptake in the absence of financial incentives was not explored in this report. A “point of sale rating tool” was also suggested by this report and by industry (MT104), presumably to create an incentive for the retrofit market by enabling consumers to recoup their spending on sustainability upgrades.

As noted above, industry sees information about sustainability products/services as necessary to drive consumer demand. However, consumer research shows that consumers seem to be more interested in the function of their homes and what suits their lifestyles, than the sustainability aspects of particular upgrades. This suggests that information alone, without financial incentives and systemic drivers, may not be enough to convince homeowners to spend money on the sustainability of their homes.

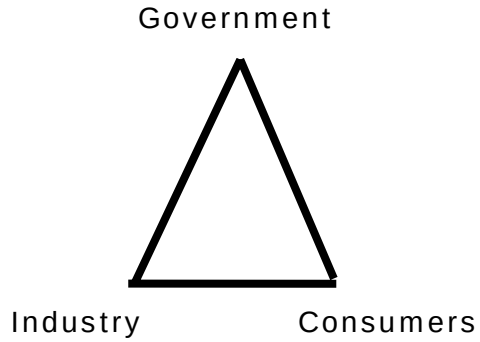
The information “gap” represents an opportunity for Beacon. There is clearly a need for information for both consumers and industry, and Beacon could have a role in information provision and/or brokering. MT101 also identifies a role for Beacon in assisting industry to bridge knowledge gaps and build capacity to provide sustainability solutions.

Another common theme is the perception that sustainability needs to be “mainstreamed” to find wider acceptance. The term sustainability is not seen by either industry or consumers as a key driver of changes to the home. This suggests that there is a need to link to comfort, affordability and good design in order to appeal to the mainstream homeowner.

4.5 Discussion

Previous Beacon reports identify a range of barriers to, and drivers for, market transformation toward improved sustainability of homes. Following discussions with Beacon around the draft of this report, a number of areas were identified in which Beacon could work to bring about market transformation, based on the inter-relationships between the three key players in the market – government, consumers and industry. These relationships are outlined in Figure 2 below.

Figure 2: Relationship of key market players



Where and how Beacon choses to put its energy in terms of working with these key players depends on where and how it determines it will have the most influence. For example, in seeking to increase consumer demand, Beacon would need to understand the factors that drive demand. These may include the availability of products on the market, their cost, information available to both consumers and industry (including manufacturers and construction firms). This suggests that Beacon could work at a number of points, with:

- government to encourage government involvement in the market where appropriate as a regulator, in its role in setting the framework for the economy, as a facilitator, as well as a consumer in its own right
- industry to provide information and evidence of the value to various levels of industry in becoming more aligned with providing sustainability solutions, and identifying how best to help build capacity to achieve this goal
- consumers to provide information and evidence of the value of investing in sustainability and helping consumers identify appropriate sustainability solutions, make better decisions and source the products/services they need.

The remainder of this report outlines the development of a wide range of market transformation interventions and describes the outcomes of a process used to prioritise these interventions. In this process a group of New Zealand market experts selected interventions which they considered had the potential to transform the New Zealand market.

5 INTERVENTIONS

5.1 Introduction

The remainder of this report covers the development of market transformation interventions considered to have the potential to transform the New Zealand housing industry to achieve Beacon's goal and high standard of sustainability.

There are many definitions for the word "transformation". Webster's dictionary defines "transformation" as:

"An act, process, or instance of change in structure, appearance, or character. A conversion, revolution, makeover, alteration, or renovation."

This definition tells us that a process is required to bring about change but does not provide guidance on the nature of the process or the extent of change required. The Beacon goal and high standard of sustainability defines the extent of change required based on an understanding of the quality of the existing housing stock. The process by which the change is brought about is an intervention.

The transformation or changes required must take into account the circumstances of the homeowner or occupant. That is, the changes required must be easy to implement, cost effective and perceived as integrated with other home improvement priorities (i.e. mainstreaming of sustainability).

Mainstreaming sustainability into all aspects of the housing value chain requires a focus on building "capacity for transformation". This concept refers to communities (of practice) that understand the need for change, have leaders able to influence change through the various networks that make up their community, and the dissemination of innovative ideas, information, tools and methods through a variety of media including the rapidly expanding electronic infrastructure.

As both market characteristics and network dynamics across the housing industry value chain are likely to influence the effectiveness of market transformation programmes, a long-list of potential interventions was derived through consideration of:

- knowledge (secondary data analysis)
- trends in business, government and innovation
- evaluative approaches
- consultation (focus groups and surveys)
- optimisation analysis.

5.2 Development of potential interventions

Potential interventions were drawn up from a range of sources:

- Review of overseas market transformation and examples – see Section 3
- Review and analysis of previous Beacon market transformation reports – see Section 4:
    - o international research and other inputs in the IND1 report[26]
    - o Survey of housing industry associations (MT101)[27]

[26] Smith A, McNicol J and Finlay G 2004. *IND1 Industry Research Impacts and Alternatives*. Landcare Research Contract Report: LC0405/032.

- Survey to determine knowledge and engagement of consumers in adopting sustainable technologies and solutions (MT102/103)[28]
- Survey to determine knowledge and uptake of sustainable practices by the housing industry (MT105)[29].

In addition to reviewing the relevant literature and previous reports, work was undertaken with Warren & Mahoney to consider interventions that might occur at the junctions on the conceptual "tube map" of the housing industry (see Appendix A). This resulted in 10 lists of interventions (the "long list") organised by the sector "lines" on the "tube map" (see Appendix B).

As there was considerable repetition between the different "lines" where similar ideas were described using different terminology, these similar ideas were rationalised according to potential **drivers of sustainable housing** (see Appendix C – the "long list" of interventions):

- Central Government
- Economic Instrument
- Local Government
- Statutory Instrument
- Voluntary Instrument
- Commercial Instrument
- Education

5.3 Prioritising the interventions – Working group

A working group of market experts was brought together to prioritise the long list of interventions bearing in mind the aims and approaches of market transformation, and to develop a framework of action for each of the top priority interventions. The experts were selected because:

- of their success in their respective markets
- of experience in New Zealand market conditions
- they were innovators or entrepreneurs.

The experts were:

- Nick Collins – Beacon Pathway (GM) and Green Building Council (Board Member)
- Graeme Finlay – Warren & Mahoney (Partner) and Green Building Council (Board Member)
- Nick Gerritsen – Crisp Start (expert in establishing start-up companies, knowledge broker – in particular, has been an advisor to the PM and to the Head of Research at Google)
- David Grimmond – Infometrics (an economist and expert in scenario building)
- Toni Owen – Eastern Bay Energy Trust (chair person and an accountant)
- Roelant Hofmans – Mike Pero Mortgages (mortgage manager with previous experience in financial products, financial risk management and triple bottom line score card methodology)

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[27] Smith A, McKernon S and McCartney J 2005. *Industry Association Alignment*. Beacon report MT101.

[28] Beacon Report MT102/MT103. Not yet published.

[29] Marquardt M, Stancu C and Gunn S 2007. *Housing Industry Survey: Towards Sustainable Products and Services.* Beacon Report MT104.

- Murray Griffin – Department of Internal Affairs, Local Government and Community Branch (experience in community development and funding advisor).

As an example of the participants' roles in market transformation in New Zealand, Mike Pero Mortgages has over 90% market recognition of their brand in New Zealand and the Eastern Bay Energy Trust runs a highly successful renovation programme for improving the energy efficiency of houses.

The experts' participation was bound by individual confidentiality agreements.

5.4 Prioritising the interventions – the context and the task

The prioritisation process was carried out in a two day workshop in June 2006. The methodology for the workshop process was developed earlier in consultation with the Beacon Pathway Research Team Leaders (RTLs) group.

The working group was provided with a detailed programme and instructions for the process (see Appendices D and E).

At the beginning of the workshop participants were introduced to Beacon's work through presentations by Ann Smith and Nick Collins on relevant research outputs up to that point in time. The presentation covered the following previous Beacon reports:

- IND 1 *Industry Research Impacts and Alternatives*
- MT101 *Industry Association Alignment*
- MT102/MT103 *Current Level of Knowledge and Uptake of Sustainable Technologies and Solutions by Households*
- MT104 *Housing Industry Survey: Towards Sustainable Products and Services*
- PR106 *Market Segmentation of New Zealand's Housing Stock*[30]

This information included a distillation of barriers to the adoption of sustainable practices by industry and the uptake of sustainable technologies and solutions by consumers for both the international and New Zealand contexts.

In the context of their own experience of the New Zealand market and learnings from the Beacon reports, the working group were given the task to:

- prioritise the long list of interventions
- identify any gaps in the range of interventions
- develop a short list of interventions
- develop a framework for those interventions.

They were also asked to provide a steer on what further information was needed in order to frame the selected interventions as concepts for the New Zealand market.

In prioritising the interventions participants were asked to apply three sets of criteria (or filters) which were previously developed with the RTLs.

The primary criteria were:

- proportion of the New Zealand housing stock likely to be affected
- likely contribution to the Beacon goal.

Secondary criteria were:

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[30] Armitrano LJ, Kirk NR and Page IC 2006. *Market Segmentation of New Zealand's Housing Stock.* Beacon report PR106.

- Has it been done elsewhere?
- Was it successful or not?
- Would it work in New Zealand?
- Can it be done cost effectively?
- Can it be done easily and quickly?
- Risks?

Further criteria considered were:

- Identification of barriers and whether they could be overcome
- If yes, what sticks and carrots would enable interventions to work
- Eliminate intervention if there are no obvious ways to overcome the barriers
- Identification of overlap – i.e. the intervention will take place due to activities of an external group
- Identification of interventions that represent "low hanging fruit"
- Identification of interventions that will give the biggest gain for least cost
- Identification of interventions that have multiple benefits
- Identification of potential "fish hooks" i.e. benefits do not go where intended
- Identification of risks i.e. possible unintended outcomes.

5.5 Prioritising the interventions – the process

Using an "action research" approach, the group worked individually and in pairs to discuss the long list of interventions, using the criteria as a guide. Group members were then asked to individually choose their top five interventions for each of the seven drivers.

The whole group then discussed the selected interventions in terms of which ones would deliver against the criteria, and participants voted for their top preferred interventions. This led to the consolidation of a short-list of 20 potential interventions. The group worked together to combine interventions considered to be similar in their function or intended outcome. A wide descriptor was used for each of the 20 interventions that covered the range of "actions" expected to make up each intervention.

Table 4 shows the short-list of 20 potential interventions, alongside the key potential drivers of sustainable housing to which each intervention relates.

Appendix F lists the 20 interventions along with international examples of their application.

Table 4 Twenty short-listed interventions

	SHORT-LISTED INTERVENTIONS	KEY DRIVER
1	Strategy to influence national policy	Central Government
2	Identification and removal of regulatory barriers	Central Government Local Government
3	National Value Case	Central Government
4	Government procurement (i.e. influencing the supply chain)	Central Government Local Government
5	Incentives (taxes and subsidies) – "sticks and carrots"	Central Government Economic Instrument Local Government
6	Packages and funding (subsidies) for retrofit	Local Government Economic Instrument Commercial Instrument
7	Rates based on environmental performance of the house (based on the Beacon high level of sustainability)	Local Government Economic Instrument
8	Reduced levies/costs for consent/compliance where sustainability technology/solutions delivered	Local Government Economic Instrument
9	WOF for every house at point of sale	Voluntary or Statutory Instrument
10	Compulsory water metering	Statutory Instrument
11	Performance standards and reporting including surveys of houses, energy and water audits – for new and retrofit	Statutory Instrument
12	Certified professions and trades	Voluntary Instrument
13	Sustainability tests and principles used in design specifications, terms of engagement, standard design briefs/ tendering/contract clauses	Voluntary Instrument Commercial Instrument
14	Incentives for branding and labelling (e.g. ecolabel for houses)	Economic Instrument Voluntary Instrument
15	Green financial tools (e.g. green mortgages, more mortgage available if running costs lower, lower insurance premiums etc)	Commercial Instrument
16	Rebranding sustainability, normalising and mainstreaming (e.g. black is the new green)	Commercial Instrument
17	Funding through utilities (e.g. pay back of new technology costs through savings, utilities pay for power going back into grid)	Commercial Instrument
18	Trusted information (across all age ranges) including education and support for sector and community groups	Education
19	Prototype houses, cases studies, stories, feedback on performance data from, all sources including Statistics NZ (e.g. links to health, house prices return on investment comparing "business as usual" with sustainable houses)	Education
20	Whole life costing (as a service)	Commercial Instrument

Each of the 20 potential interventions was analysed through a participatory process involving all the members of the working group using the primary, secondary and other criteria. This process, along with consideration of the New Zealand market context and the barriers, reduced the 20 potential interventions to four key interventions:

1. National Value Case
2. Voluntary "WOF for every house" rating tool
3. Council rates that include environmental performance
4. "Trusted Information" – an education strategy for all stakeholders in the housing industry.

Many, if not all, of the 20 interventions are encompassed within or would be triggered by the four key intervention projects (see Table 5).

The National Value Case was seen as an intervention that would provide the "business case" at a national level for a "strategy to influence policy" in favour of sustainable housing. It would identify and recommend the removal of regulatory barriers. It would show how government procurement could influence the adoption of sustainable practices by industry and the adoption of sustainable techniques and solutions by consumers. It might suggest economic incentives in the form of subsidies or taxes to stimulate the adoption of sustainable practices by industry and the adoption of sustainable techniques and solutions by consumers. Interventions 1, 2, 4 and 5 are unlikely to take place without making a case to national government. The National Value Case is intended to provide sufficient information for an economic case to be made for government to make decisions that support action (investment) to improve the sustainability of the national housing stock.

The voluntary "WOF for every house" rating tool at point of sale is seen as an intervention that would stimulate improvements in the environmental performance of houses by both buyers and sellers. The rating would provide householders with the information needed to identify which improvements to make to get the best return on their investment. Interventions 6 and 11-17 would in turn be stimulated by this intervention. Some of these are commercial activities that would be justified because a demand had been created by the rating for improving the environmental performance of houses. As householders seek to improve their houses, this in turn will stimulate the market for sustainable products and services.

In the case of Council rates that include environmental performance, interventions 9-11 provide the tools that generate the information needed to calculate the performance element of the rates. This intervention is inter-related with the WOF for every house.

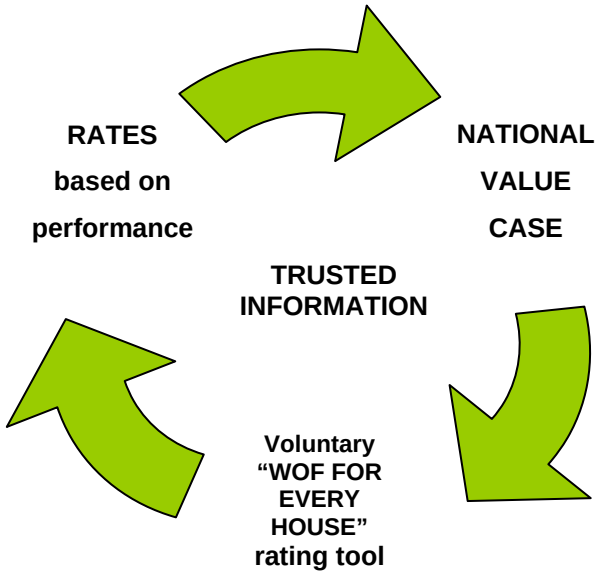
The trusted information intervention is in itself an information provider to empower all players along the sustainable housing value chain to both make decisions and take action. The four key interventions are inter-related, but they are not inter-dependent, except for "trusted information" which underpins the other three interventions (see Figure 3).

Table 5: Interventions associated with each of the four key projects

PROJECT	INTERVENTIONS
National Value Case	1, 2, 3, 4, 5

Voluntary ”WOF for every house” rating tool	6, 9, 11, 12, 13, 14, 15, 16, 17
Rates based on performance	7, 8, 9, 10, 11
“Trusted information”	12, 18, 19, 20

Figure 3 Four key interventions inter-related but not inter-dependent except for the Education Strategy that underpins the other three projects



5.6 Selected interventions as examples of four approaches to market transformation

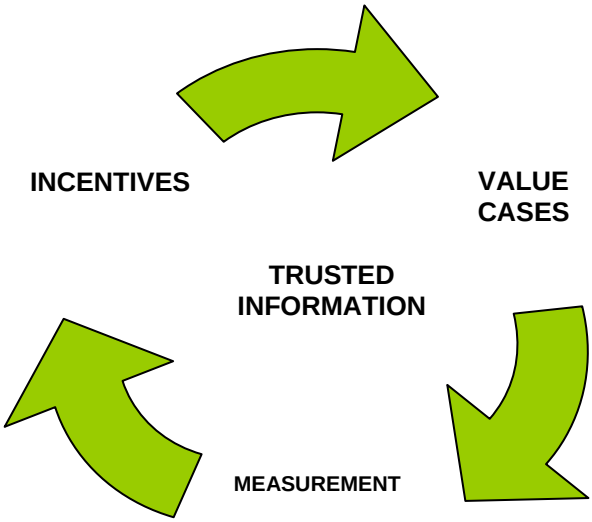
This report was discussed with Beacon Pathway in a draft form before it was finalised. These discussions identified that Beacon saw the four interventions selected by the working group, from a wider perspective, as examples of four underlying approaches to market transformation. Within each approach there are likely to be interventions other than those chosen by the working group, which could be of value in promoting market transformation. The four themes or approaches suggested here are:

- value cases – other value cases could be developed to help stakeholders understand who needs to change, how and why they should do so. Examples are value cases for local government, various levels of industry and consumers
- a trusted form of measurement – the voluntary “WOF for every house” rating tool is one approach to developing a measurement tool. Beacon could consider promoting or developing other approaches and these could underpin labelling schemes and mandatory or voluntary standards
- incentives – performance based rates is one method that Beacon could promote as a pilot for incentivising sustainable housing, however this could be too slow to meet Beacon’s targets. Other examples of incentive schemes could also be considered for Beacon to trial or demonstrate

- trusted information – there is a wide variety of ways Beacon could work to ensure trusted information is developed and made widely available. Beacon could work with a range of partners in this area. Further work would be required for Beacon to understand its role, what information is needed and how to provide it.

The following diagram (see Figure 4) shows that the four market transformation approaches are interrelated in the same way as the four key interventions identified by the working group process.

Figure 4 Four interrelated market transformation approaches



These four market transformation approaches may not be all that is needed to effect market transformation, however. It is likely that any market transformation strategy would also need to include:

- minimum standards (regulation)
- implementation (ensuring knowledge and skills to implement improved sustainability of homes is in place and is constantly updated)
- monitoring and evaluation of intervention programmes.

6 NATIONAL VALUE CASE

Making the case for the national benefit to be gained by transforming the New Zealand housing stock – both new and existing - to improve sustainability.

6.1 Background

Beacon's research has confirmed that the New Zealand housing stock is generally poor quality with poor environmental performance. This places direct and indirect burdens on the economy. Direct burdens include higher than necessary needs for health, police, and emergency services; energy demand; and carbon emissions relating to climate change. Indirect burdens include lost productivity and reduced educational achievement. Issues such as "leaky homes" show how low standards in design, construction and maintenance can also create a burden on the economy.

For government, Net National Product (the total market value of all final goods and services produced in New Zealand – effectively Gross National Product (GNP) minus depreciation) is used as a measure of (macro-) economic well-being. The performance of the economy is affected by growth and employment which, in turn, are reliant on education, health and immigration. Poor performance of the housing stock can adversely affect health leading to lost time from education, employment and leisure. Sustainable housing can favourably affect health thus reducing these losses. A positive reputation for housing can attract skilled immigrants.

For households, income and spending are measures for (micro-) economic well-being. Household investment in improving the sustainability of homes will be dependent on their ability to switch spending between leisure and consumption, and is a complex decision influenced by motivation and perceived return on investment. The multiple benefits related to education, health and employment are not explicit in these decisions.

Buy-in from government and stakeholders in the housing industry (designers, developers, homeowners and landlords) to the interventions proposed in this report could by optimised by demonstrating the value of sustainable housing at macro- and micro-economic levels.

6.2 Purpose

The key purpose of the National Value Case is to provide government with a business case to convince government and other key audiences of the value of sustainable housing, thereby creating the conditions for these groups to invest in interventions to promote sustainable housing.

6.3 Rationale

The National Value Case's key focus is how improving the sustainability of the housing stock can be valued as an asset related to Net National Product. This will provide high level drivers for a range of players, from central and local government to voluntary organisations, to become involved in sustainable housing issues. This in turn will create demand for a wide variety of commercial products and services, "trusted information" and decision making tools.

Beacon has already agreed to the concept of a National Value Case and has commissioned work to develop this intervention further.

6.4 Approach

The National Value Case will meet the requirements of Cabinet's regulatory impact statement process, which is overseen by the Ministry of Economic Development. It will cover the following areas:

- A detailed economic cost benefit analysis of a sustainable building approach to Beacon's four key areas of Neighbourhoods, Energy, Water and Indoor Environmental Quality. It will demonstrate, with evidence, the economy-wide benefits of having a higher quality housing stock. This would address the transmission paths for a range of national issues related to housing (e.g. health, employment, education, immigration, tourism, climate change, energy, water, waste etc) and the types of benefits for third parties (i.e. not the individual consumers and producers). For example, better insulation leads to lower energy consumption, lower electricity prices for industry, later requirements for new power stations. These benefits will be quantified appropriately (i.e. in terms of their framework and requirements)
- Discussion about the types of initiatives that would be required to obtain these benefits, including Beacon initiatives. Other central and local government policies and the baseline regulation which might be required will also be discussed. This will be a conceptual discussion initially as net benefits will depend on the way that the benefits are obtained and therefore the types of costs involved (e.g. the benefits of a regulation that forces a retrofit change on all houses might have large benefits but it also might have very large costs via obsolescence of capital stock). Actual costs and benefits are thus dependent on not only the form of benefit but also on the cost involved for the method used to obtain the benefit
- Analysis of micro-data relating to the aggregate potential impact of changes to individual houses (e.g. the costs and benefits arising from different types of energy saving, or increase in indoor temperature, from insulating a house)
- Modelling of economy wide impacts of one or two specific types of housing improvements for new and existing houses. For example, the initiative might be better insulation, with benefits including energy cost reductions, health improvements and maybe fiscal improvements (via lower health or social welfare spend). Other impacts that could be modelled include lower use of landfills due to reduced waste from construction sites, reducing the risk of damaging New Zealand's clean-green branding image.

6.5 Process

The National Value Case will be presented in draft form to the Treasury and Ministry for Economic Development, a range of other key government departments, and other key decision makers (including regional and local authorities) for consultation, to enable them to add to the paper. After review by Beacon, it is envisaged the paper will be published as a high quality position document.

6.6 Audience

The audience for the National Value Case includes:

- Central Government – Treasury, Department of the Prime Minister and Cabinet), Ministry of Economic Development, Ministry of Social Development, Ministry of Health, Ministry for the Environment
- Local Government New Zealand, Electricity Commission, Commerce Commission, Housing New Zealand Corporation, Department of Building and Housing

- State Owned Enterprises, sector bodies, landlord associations, business associations

7 VOLUNTARY "WOF FOR EVERY HOUSE" RATING TOOL

Catalysing a high standard of sustainability (HSS) in new, retrofit and rental properties through a voluntary rating tool, to be used by a variety of audiences – vendors and purchasers at the point of sale of houses, tenants in choosing rented property, banks to make mortgage decisions, insurance companies to set premiums, councils to set rates.

7.1 Background

There are growing expectations from government bodies and within industry for the built environment to meet minimum standards of environmental performance (Marquardt, Stancu and Gunn, 2007). Most home owners spend money to improve their property on moving into a new property or preparing to sell it. If there was a requirement to provide a rating at the point of sale, this could direct the improvements made at these two stages to work towards the HSS. However, it would take some time for such an intervention to become mandatory. On the other hand, a voluntary self-assessment rating tool could be developed cheaply and quickly, for implementation in the short term.

The voluntary "WOF for every house" rating tool would be based on the considerable work and experience which has already gone into the development of existing house rating schemes. There are a number of house rating schemes currently in use or development in New Zealand and overseas (see Table 6).

In New Zealand three house rating schemes are relevant to this discussion:

- BRANZ Ltd Green Home Scheme[31]
- Tool for Urban Sustainability (TUSC)[32]
- Energy Efficiency and Conservation Authority (EECA) is currently developing a Home Energy Rating Scheme (HERS)[33]
- Green Star[34] (used by a number of countries, and currently being piloted in New Zealand for commercial office building by the Green Building Council).

Except for TUSC, none of the existing New Zealand rating tools cover the full range of Beacon's HSS targets. The Green Home rating scheme is the most comprehensive in terms of the HSS targets, but can not be applied to existing, rental and new residential properties. All can be applied for new properties, at the planning and design stage.

Overseas, the main rating schemes are:

- Building Research Establishment Environmental Assessment Method (BREEAM)[35] and BREEAM Ecohomes[36] (UK)
- Building Sustainability Index (BASIX)[37] (Australia, NSW)

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[31] Green Home Scheme. See www.branz.co.nz/main.php?page=Greenhome%20Scheme

[32] TUSC. See www.tusc.org.nz/index.cfm/home

[33] Home Energy Rating Scheme. See www.eeca.govt.nz/residential/home-energy-rating-scheme/indexnew.html

[34] Green Star. See www.nzgbc.org.nz/index.php?option=com_content&task=blogcategory&id=80&Itemid=75

[35] BRE Environmental Assessment Method. See www.breeam.org/

[36] BREEAM Ecohomes. See www.breeam.org/page.jsp?id=21

[37] BASIX. See www.basix.nsw.gov.au

- Code for Sustainable Homes[38] (UK)
- Energy Star, Qualified New Homes[39] (USA)
- Leadership in Energy and Environmental Design (LEED)[40] (USA)
- Sustainable Tools for Environmental Performance Strategy (STEPS)[41] (Australia, Victoria)

Not all of these are relevant to houses, and some only apply to new buildings. There are some 10 “green building” schemes listed on the Smart Communities Network[42] for the USA alone.

A “point of sale rating tool” was suggested as a potential mechanism to drive consumer uptake of sustainability measures in previous Beacon reports MT111 (Hargreaves 2005) and MT104 (Marquardt, Stancu, Gunn 2007). This approach also relates to findings in MT102 (McKernon 2005) that homeowners are often concerned that they will not recoup their financial investment in sustainability-related improvements as these will not be valued by future purchasers of the property. IND1 (Smith, McNicol, Finlay 2004) also raised the need for rating schemes if the New Zealand industry was to deliver sustainable housing solutions.

7.2 Purpose

The concept of the voluntary “WOF for every house” is a voluntary on-line tool to rate houses on a range of sustainability measures. “WOF for every house” branding will be used in advertising a property at the point of sale or rental. The key purpose is to improve sustainability in new, retrofit and rental properties by providing a tool for key stakeholders (home buyers, tenants, designers, developers, financial and insurance institutes, councils) to make decisions about particular houses. The voluntary ”WOF for every house” will stimulate demand and supply for products and services to improve the sustainability of New Zealand homes, working toward the HSS.

The ”WOF for every house” is envisaged as a voluntary on-line self-assessment rating tool, initially made available on a trial basis through the Trade Me property sales and rental website. This has the potential to become a commercial intervention that can grow organically and stimulate the development of new technologies and new services for the housing industry.

7.3 Rationale

An intervention is needed that will drive home owners to improve the environmental performance of their properties, existing and new. Such an intervention should reward home owners for improving their properties and provide incentives for them to do so. A requirement at point of sale or lease may incentivise seller, renter and buyer to take action to improve the environmental performance of the housing stock.

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[38] Code for Sustainable Homes. See www.planningportal.gov.uk/england/professionals/en/1115314116927.html

[39] Energy Star, Qualified New Homes. See www.energystar.gov/index.cfm?c=new_homes.hm_index

[40] LEED. See www.usgbc.org/DisplayPage.aspx?CategoryID=19

[41] STEPS. See www.morelandsteps.com.au/links.html

[42] Smart Communities Network, Green Buildings Energy Rating Systems. See www.smartcommunities.ncat.org/buildings/gbprogrm.shtml.

7.4 Approach

A “WOF for every house” certificate would record the current environmental performance of the house or rental property for selected criteria. The house performance could be measured (audited) as part of the house survey prior to sale or as part of any regular approvals needed for rental property.

It is envisaged that the voluntary “WOF for every house” would be set up on a commercial basis. It could be piloted in conjunction with “green mortgages” or other similar financial instruments. Once it becomes better known it will be publicised through existing property sales and rental mechanisms. The pilot could be undertaken in collaboration with an organisation like Trade-Me and a number of properties willing to participate in a trial of the voluntary ”WOF for every house”.

As its popularity grows, it is hoped the voluntary ”WOF for every house” would become self-promoting and by default become a “requirement” for home buyers and renters to consider when choosing a home. Through a “staircase effect” the acceptance of the voluntary ”WOF for every house” by the market may put pressure on regulatory bodies for it to become formalised. One example is the ”WOF for every house” being picked up by Local Authorities as a tool for setting rates to take into account sustainability performance of homes (see intervention 3 – Council rates based on performance). At that point it is hoped a body may pick up the “WOF for every house” concept and turn it into an official certification. For example, the voluntary “WOF for every house” could be branded and administered by an organisation such as the Green Building Council.

7.5 Process

Issues to be considered in developing, testing and implementing the voluntary ”WOF for every house”

It is not intended that Beacon establish a home rating tool to compete with those already in the market. Rather, it is intended that Beacon work in a collaborative way with existing rating scheme sponsors (e.g. BRANZ) to develop a “leading” scheme. This would incorporate the factors Beacon has identified as contributing to the HSS (energy, water, indoor environmental quality (IEQ) and materials (resource efficiency and waste reduction)), as well as the best features of existing schemes. This is likely to entail pulling together aspects of existing schemes, and in some cases upgrading existing tools to cover the full range of issues of concern to Beacon.

Further consideration of how best to work with other organisations to develop the voluntary “WOF for every house” concept would require assessment of three existing New Zealand schemes (BRANZ Green Home Scheme, TUSC, and HERS) in terms of how they encompass the HSS factors (see Table 6 for a preliminary overview of these issues) and other considerations including:

- scheme coverage – the voluntary ”WOF for every house” should apply to new, retrofit and rental properties
- ownership of the development and quality of the voluntary ”WOF for every house” as a house rating tool
- training and accreditation of assessment organisation(s)
- ease of participation for sellers and buyers
- gaps and opportunities
- governance issues.

Table 6 New Zealand and international house rating schemes: Key features and comparison with Beacon HSS targets

New Zealand scheme and sponsor	Key features	Covers all HSS targets	HSS targets NOT covered
Green Home Scheme – BRANZ Ltd	• Applies to **new houses**. • Aims to promote sustainable, healthy and safe homes by recognising the environmental impact buildings have on their occupants and surroundings. Voluntary design tool • Coverage includes: o household energy efficiency o more sustainable materials o water economy o site selection o indoor air quality	**X**	• Materials (construction waste) Doesn't cover existing houses or renovations
The Tool for Urban Sustainability: Code of Practice (TUSC) – Waitakere City Council	• Applies to **new houses, retrofitting, neighbourhoods**. • Aims to produce a web-based tool that will deliver cost-effective urban sustainability outcomes in both new developments and urban retrofit or intensification projects. Voluntary design tool • For houses covers: o energy (hot water, appliances, lighting, alternative supply, heating and cooling) o water, stormwater and wastewater	**X** Covers all housing stock of interest to Beacon	• IEQ • materials
The Home Energy Rating Scheme (HERS) – EECA	• Under development. Will apply to **new** and **existing houses**. Initially voluntary, eventually will become mandatory for all houses • Aims to make property owners, prospective buyers and tenants aware of the energy performance of their houses, through a home energy rating • Covers energy only	**X**	• Water • IEQ • materials

International scheme and sponsor	Country	Key features	Covers all HSS targets	HSS targets NOT covered
BREEAM (Building Research Establishment Environmental Assessment Method) and Ecohomes – Building Research Establishment	United Kingdom	• Applies to **new**, and **renovated houses, flats** and **apartments** (for new housing in England about to be replaced by Code for Sustainable Homes) • Aims to balance environmental performance with the need for a high quality of life and a safe and healthy internal environment. • Coverage includes: o operational energy o transport o health and well-being o water o materials o pollution	√	Covers all housing stock of interest to Beacon
Code for Sustainable Homes	United Kingdom	• Applies to **new houses** • Aims to protect the environment by providing guidance on the construction of high performance homes built with sustainability in mind. Mandatory performance levels in 6 areas • Covers: o energy efficiency/CO_2 o water efficiency o surface water management o site waste management o household waste management o use of materials	**X**	• IEQ Doesn't cover existing houses or renovations
BASIX (Building Sustainability Index) – NSW Government	Australia, New South Wales	• Applies to **new houses** and **neighbourhoods**, **renovations and additions** (over $100,000) and swimming pools with a capacity of 40,000 litres • Aims to reduce water consumption and greenhouse gas emissions by 40%. Mandatory design tool • Covers: o water o thermal comfort o energy	**X** Covers all housing stock of interest to Beacon	• IEQ • materials

International scheme and sponsor	Country	Key features	Covers all HSS targets	HSS targets NOT covered
STEPS (Sustainable Tools for Environmental Performance Strategy) – Moreland City Council, Victoria	Australia, Victoria	• Applies to **new houses** • Aims to provide information to increase proposed houses' sustainability performance. Voluntary design tool • Covers: o greenhouse emissions from operating energy o peak energy use o drinking water use o stormwater quality impacts o building material impacts o bicycle places required o area need for waste recycling services	**X**	• IEQ Doesn't cover existing houses or renovations
LEED (Leadership in Energy and Environmental Design) – US Green Building Council	USA	• Currently being developed for **new houses** and **neighbourhoods** • Aims to ensure that a home is designed and built to be energy efficient, resource friendly and healthier for the occupants	**?**	Doesn't cover existing houses or renovations
ENERGY STAR Qualified New Homes	USA	• Applies to **new houses** • Aims to certify homes built to meet guidelines for energy efficiency so they are at least 15% more energy efficient than homes built to the 2004 International Residential Code. Voluntary tool • Covers energy only	**X**	• Water • IEQ • Materials Doesn't cover existing houses or renovations

Implementing the voluntary "WOF for every house" rating tool

Preliminary thinking about how the voluntary "WOF for every house" could be implemented includes:

- Further work would be required on which organisations would be most appropriate to "own" and administer the "WOF for every house" and who should train assessors. For example, the "WOF for every house" could be administered and training standards could be developed by an organisation such as the Green Building Council[43]. "WOF for every house" assessment and certification could be based on existing surveyors or an organisation such as Property Check[44] (see box below).
- Opportunities to involve Quotable Value[45] and Land Information New Zealand[46] (see Table 7 below) could be explored as a means of providing additional credibility to the voluntary "WOF for every house". For example, the assessment data could be held by one of these organisations
- The "WOF for every house" may in time also cover earthquake preparedness and healthy home criteria, where these items are within householder's or landlord's control to upgrade to meet the "WOF for every house" requirements.

Table 7 Organisations that might be involved in the development and delivery of the "WOF for every house"

Green Building Council is a membership based organisation which aims to accelerate the development and adoption of market based Green Building practices. The immediate focus of the organisation is setting standards of best practices through the adaptation of the Green Star rating tool, education and training for all parts of the value chain, providing access to networks, information and resources for members to actively lead the market.

Property Check provides complete inspection and reporting on residential properties. A Building Report by Property Check is designed to give the client the knowledge to enable them to proceed with their purchase with the confidence required to make a sound investment decision. Property Check provides an independent inspection and report that is compliant with the new 'New Zealand Standard NZS4306' (part 1). This standard is the new standard for inspections of buildings.

Quotable Value Limited (QV) is New Zealand's largest valuation and property information company. QV maintains a national property database which holds information on every property in New Zealand. QV receives property information from each of the 74 councils in New Zealand, and updates its database regularly.

Land Information New Zealand holds authoritative information about land surveys and ownership, topographic maps and nautical charts. We make sure that the rating valuation system is fair and consistent and oversee the buying and disposal of Crown land.

[43] Green Building Council. See www.nzgbc.org.nz/

[44] Property Check. See http://realestate.t5.co.nz/property-check.html

[45] Quotable Value. See https://www.qv.co.nz/

[46] LINZ. See www.linz.govt.nz/home/index.html

Opportunities to develop commercial tools and services

The following list of commercial opportunities of the voluntary "WOF for every house" scheme is not exhaustive, but is a good starting point to think about the value of the scheme:

- Training, assessment and certification services could be franchised to other providers (such as Property Check, as noted above)
- The existence of the rating tool could stimulate supply and demand for related environmental technologies. Examples include the hardware and software for hand-held environmental performance measurement and recording devices, and online software tools (e.g., the assessment of the running costs of a rental property).
- To avoid the slowness and difficulties seen in comparative overseas rating schemes, the "WOF for every house" will be commercialised. An online self-assessment tool could be linked to online sales sites such as Trade Me, which could have a sales template that includes the "WOF for every house" criteria. Supporting information on the relevance of the "WOF for every house" certificate to house value would need to be available before the voluntary "WOF for every house" is made public, as it is likely to grow rapidly.
- The early commercial players (e.g. Trade-Me) could be given exclusivity for a limited period before the products are made available to others (e.g. estate agents). There may be the opportunity to develop software-based financial tools for estimating the house or rental property value.
- Retailers could develop and supply a range of retrofit packages including products to meet the various requirements of the "WOF for every house". Loyalty card systems based on the "WOF for every house" rating could give discounts on the packages or cost of the "WOF for every house" assessment, with points awarded as the "WOF for every house" rating improves. Utilities (electricity and water) may partner with retailers, subsidise relevant retrofit packages, or enable payment for retrofit packages through savings on utilities bills.
- Retailers could provide in-house on-line self-assessment software that allows the householder to enter their data for the house or rental property and be signposted to the information, guidance and retrofit packages. This could be linked to a loyalty card.
- A range of supporting materials could include guides for DIY and retrofit that provide instructions for the materials and actions needed to improve environmental performance in ways that improve the "WOF for every house" rating.
- Tools could be developed that allow the householder or consumer to assess utilities consumption and appliances that use electricity, gas and water. A tool for measuring water consumption equivalent to the Centameter (a wireless meter to show live-time electricity consumption) could be developed.
- Developers, housing companies and builders could incorporate "WOF for every house" requirements in new build and offer houses for sale with the "WOF for every house" rating in place. Financial products could be made available that account for the reduced running costs and reduced risk associated with houses that have a "WOF for every house" certificate. This should enable increased debt servicing rates and a rethink on re-insurance premiums. Links could be made between the "WOF for every house" and Westpac's recently introduced Green Home Loan, which gives customers discounts from a range of suppliers, including solar water heaters, insulation, energy and water efficient appliances
- Could stimulate the development of an approval process for tradespeople who have the necessary training and skills to advise on and install "WOF for every house" - related products and services (e.g. Green Plumbers scheme). This would enable consumers to identify appropriate tradespeople to carry out installations that are beyond the ability of DIY-homeowners.

7.6 Audience

The voluntary “WOF for every house” could be used by the following audiences:

- purchasers at the point of sale of houses
- tenants in choosing rented property
- designers and developers in producing new housing
- banks to make mortgage decisions
- insurance companies to set premiums
- councils to set rates.

8 RATES BASED ON PERFORMANCE

Leveraging off the voluntary "WOF for every house" *rating tool by promoting the opportunity for proactive councils to pilot rates based on the HSS.*

8.1 Background

"A gradual shift of today's taxes away from personal income and capital towards taxes on consumption, pollution, and inefficient use of energy and resources can boost employment, eco-innovation and protect the environment". Jacqueline McGlade, Executive Director of the European Environment Agency, Brussels Tax Forum, .19 March 2007[47]

Government, and local government, policy has a major impact on all sorts of economic activity. Expenditures and subsidies paid by governments make some goods and services cheaper to produce, and thus increase their use; taxes have the opposite effect. Government-imposed regulations constrain or encourage many sorts of activities to meet social goals. IISD (1994) [48] point out that many existing and emerging policies have a major and fundamental flaw: their design and implementation did not adequately consider environmental or ecological impacts of economic decisions.

Redistributing environmental charges within sectors is fast proving the most popular solution internationally (IISD, 1994). Such 'budget neutral instruments' redistribute funds from poor environmental performers to superior ones. They create a dynamic within industries or economies to improve general standards of environmental performance without forcing everyone to comply with regulations, which may in some cases have unintended consequences or stifle innovation.

For example, in the UK savings in disposal costs from waste being recycled rather than disposed of, are transferred from the disposal authority to the groups who collect waste for recycling. This gives a signal to the market about the true financial costs of waste collection and disposal, to compare against the costs of the alternative – recycling (DEFRA, 2006)[49].

In countries with advanced sustainable development strategies (e.g., Scandinavian countries) the focus is increasingly on sustainable consumption and production, and shifting taxation from employment to resource use and environmental impacts. It is becoming increasingly apparent that governments must reform and restructure budgets using economic incentives and instruments to ensure sustainable development and sound environmental management (ACCA and Environment Agency, 2002)[50].

In New Zealand local authority rates could provide incentives for ratepayers to consider their environmental impacts. Local authorities set rates under the Local Government (Rating) Act 2002. This Act provides a number of options for setting rates, such that local authorities can use combinations of general rates, targeted rates and/or uniform annual general charges

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[47] McGlade J 2007. *Experience with the use of economic instruments in Europe.* Speech by Professor Jacqueline McGlade Executive Director, European Environment Agency at *The Brussels Tax Forum: Taxation for Sustainable Development*, Brussels 19 March.

[48] International Institute for Sustainable Development 1994. *Making Budgets Green.* URL: Winnipeg, IISD.

[49] Department of the Environment, Food and Rural Affairs 2006. *Guidance on the recycling Credit Scheme*. London, DEFRA.

[50] Association of Chartered Certified Accountants and Environment Agency 2002. *Working with Environmental Taxes.* London, ACCA.

(see Table 8 below). Legal analysis is likely to be required to determine whether rates based on the environmental impacts of homes could be set under the current rating regime.

Table 8 Options for local authorities for setting rates

General Rates - where the local authority decides that all ratepayers should pay for all or part of a particular council service. What each ratepayer pays depends on the assessed value of their property relative to the value of other properties. Generally, the higher the assessed value of the property, the higher the rates. However, councils can decide that different categories of properties should contribute differently to the total general rate. For example a council can decide that commercial and/or industrial properties should pay a different rate per dollar of property value than residential properties. This is called differential rating. Some councils differentially rate rural, rural-residential and urban areas

- **Targeted rates** - where the local authority (possibly even all ratepayers) on a different basis than its general rate. There is considerable scope for local authorities to target functions in specific areas and to set different levels of rates for different properties. For instance, a targeted roading or water supply rate might be specific to a particular town or locality, or apply to the whole council area and used to provide greater transparency.
- **Uniform annual general charge** - a flat dollar charge per property, where all properties pay the same for a delivered service regardless of the value of the property. The total amount of uniform annual charges cannot exceed 30 percent of the total rates set by a council in any one year, excluding uniform annual charges for water and wastewater.

Some form of financial incentive, of which the rates based on house performance intervention is a subset, was seen by industry in MT104 (Marquardt, Stancu, Gunn 2007) as a key driver with potential to stimulate higher demand from consumers for sustainable products and services. IND1 (Smith, McNicol, Finlay 2004) also raised the need for fiscal incentives if the New Zealand industry was to deliver sustainable housing solutions.

Interventions with similar aims are being considered or implemented in other countries; for example, in the UK, a household carbon tax and waste charges that vary according to the amount of emissions and waste that households produce is being considered (Leicester, 2006)[51].

8.2 Purpose

This intervention tests the concept of including the environmental performance of houses in the setting of council rates.

Note: Currently there is an opportunity to make an input into the local government rates enquiry on these issues. Deadline for submissions is 30 April 2007. Full terms of reference are available from the Rates Inquiry Webpage

www.ratesinquiry.govt.nz/diawebsite.nsf/wpg_URL/Agency-Independent-Inquiry-into-Local-Government-Rates-Terms-of-Reference?OpenDocument.

8.3 Rationale

Local government is unique in that its responsibilities and concerns are very well aligned with Beacon's targets for a high standard of sustainability in New Zealand's residential built environment. Local authorities have responsibilities relating to individual houses, sustainable development at a neighbourhood level and recording and reporting on local contributions to national carbon emissions. They are therefore in the best position to shape the built environment to reflect Beacon's concerns, should these accord with the aspirations of local communities. Local authorities in the best position to become early adopters are those where

[51] Leicester A 2006. *The UK Tax System and the Environment*. London, Institute of Fiscal Studies.

local communities are supportive of councils working towards local carbon neutrality and zero waste.

If the way that local authorities determined their rates (and thereby charged for their services) included the environmental performance of houses, that could influence household consumption of resources, including energy and water. This assumes that water metering is in place. Although local authorities do not have any responsibilities for energy generation or reticulation, improving the energy efficiency of households should contribute to warmer healthier homes and thus reduce health related bills and absenteeism from school etc.

The rating system could signal to homeowners the value of improved environmental performance of houses to the local, regional and national environment. Houses with a smaller environmental footprint could attract a lower rates bill on the grounds that they are less of a burden on local authority services than other homes. For example, they are likely to produce lower levels of waste water, storm water, solid waste and air pollution. Over time this is likely to drive improvements in the environmental performance of the New Zealand housing stock.

It is important to ensure local government's capacity to address community expectations is maximised both through improved regulation and through adequate resourcing. Against rates being based on house performance, it may be argued that council revenue will shrink as houses perform better environmentally. However, it is assumed that charges for council services will rise as the demand for those services reduces. As the number of environmentally efficient homes increases there will be less demand on services such as reticulated water and sewage. This will reduce the need to provide new facilities over time, and the new facilities that are needed will be charged at a higher rate, penalising less efficient households.

8.4 Approach

The voluntary "WOF for every house" intervention presents the opportunity for local authorities to set lower rates for houses that have received a favourable "WOF for every house" inspection. However, given the "WOF for every house" intervention may take some time to implement, it is suggested that Beacon work with a willing local authority to develop a pilot programme to test the concept of basing rates on environmental performance of houses.

In the pilot programme local authority rates could be assessed taking into account the performance of homes in terms of energy, water, IEQ and materials (resource efficiency). Rates assessment would be partially based on whether:

- homeowners could meet energy and water consumption targets
- insulation met standards required by the new building code
- heating was from a clean source.

The way in which the rates assessment could reflect good results in these areas would have to be worked through with the pilot local authority. As a starting point, it is suggested that there could be rates rebates where energy and water consumption target are met and/or penalties for exceeding targets. The design would also have to consider whether a house could trade low water consumption for high electricity consumption and so on.

8.5 Process

Initial processes would include identifying willing local authorities, working through implementation and legal issues, monitoring and evaluating the pilot. It is envisaged that the

pilot would be evaluated after two years and a model approach would be presented to other local authorities for them to take up if desired.

In order to evaluate the effectiveness of the intervention the pilot would have to cover a statistically sufficient number of houses, with a control group. Both groups would be monitored across the range of environmental indicators expected to be influenced by the intervention.

The houses within the pilot study would need to have water metering already in place. Householders and water and electricity suppliers would have to agree to provide annual reticulated water and electricity consumption per participating rated residential address. This intervention has strong links with the trusted information intervention (see next section) as householders participating in the trial would need to be able to access trusted information about how to make their houses more sustainable.

The intervention should be for a minimum of two years in order to enable evaluation.

8.6 Audience

Opportunities should be developed to work with Local Government New Zealand and relevant central government agencies in designing this intervention. The audiences for the outcomes of the pilot will be all local authorities, central government decision-makers and all ratepayers.

9 TRUSTED INFORMATION – EDUCATION STRATEGY

9.1 Background

Underpinning other market transformation interventions with sufficient trusted information to enable all stakeholders in the housing industry value chain to make decisions about sustainable housing.

Public willingness to accept more responsibility for changing to environmentally sustainable practices has been shown to depend on four factors (Scott and Skea, 1998)[52]:

- Belief in a moral duty of care
- Ability to exercise choice over the expenditure of time and money
- Confidence that the actions undertaken will be effective
- Conviction that environmental responsibilities are being assumed equally across all sectors of society

The key factor that Beacon has the opportunity to influence is public confidence that building-related products, processes and techniques will provide sustainable outcomes and be cost effective.

The need for some form of education or information provision tool for the public and/or industry was highlighted in previous Beacon reports IND1 (Smith McNicol, Finlay 2004), MT101 (Smith, McKernon, McCartney 2005) and MT104 (Marquardt, Stancu, Gunn 2007).

9.2 Purpose

The trusted information education strategy would **establish a culture of providing trusted information on sustainable housing to stakeholders in the housing value chain**. The strategy will focus on defining what "trusted information" is for each of the groups identified in the housing industry value chain (see Figure 5). "Smart" information tools should satisfy stakeholder needs by signposting existing sources of information and providing decision-making tools to assist stakeholders to navigate and select relevant information i.e. in the New Zealand context and, if required, in a regional context.

Figure 5 Housing industry value chain

9.3 Rationale

Information is the one tool that is essential for any job around the house, or for making decisions on new buildings. While information on home ownership, building, renovation and maintenance is widely available, it is often promotional. Questions of validity and reliability often occur, particularly when information is sourced from the internet. Information on

[52] Scott A and Skea J 1998. *Implementing Sustainable Development: Research Insights.* Global Environmental Change Programme, Economic and Social Research Council. University of Sussex, ESRC.

sustainable solutions is less readily available, with similar issues around validity and reliability.

New Zealand's progress towards more sustainable housing depends on our ability to communicate effectively, making trusted information available at the right time, in the right place for end-users to act on it.

This intervention is strongly linked to Beacon's founding philosophy. Beacon has stated in its strategic plan that tools available to achieve its goals include communication, information sharing opinion forming and network facilitation, supported by good scientific research. The importance of communication and education is demonstrated by their inclusion as one of Beacon's three key enablers.

9.4 Approach

The aim is for Beacon to become a trusted information broker. This will involve developing a "knowledge centre", which will identify sources of trusted information and the tools/criteria for end-users to judge whether information can be trusted. Through the trusted information strategy Beacon will also identify where information gaps exist and act as a catalyst or facilitator i.e. work with the appropriate organisations to ensure this information is produced.

The trusted information strategy will draw on and signpost a wide variety of information sources. Organisations such as government departments, BRANZ, Consumers' Institute, councils, industry associations and NGOs all produce relevant information.

Trusted information can also be self-generated and/or commissioned and provided by a third party. An example of a self-generated information source is Homestars[53], an online resource from Canada which lets homeowners post reviews of home-related products and services. Reviews are not verified by Homestars – they are solely the opinion of the contributor, and can only be used for non-commercial purpose. Homestars will delete reviews if they are found to be false or misleading. An example of a third party information source is the Canada Mortgage and Housing[54] site. Although apparently under ultilised, this covers a variety of topics related to home ownership and step-by-step guides to renovating a home and using environmentally friendly building materials and processes.

Further work would be required to support the design and delivery of the trusted information strategy. Key questions to be addressed include:

- What is the definition of trusted information? An early working definition is "expert opinion confirmed by accounts based on the experiences of consumers"
- How can Beacon and its stakeholders can have confidence in information brokered by the strategy?
- Is the information fit for the intended purpose?
- Who needs trusted information?
- How can trusted information best be gathered, stored and shared?

One example of good practice in the provision of trusted information is the German scheme EcoTopTen[55] which provides independent consumer information on the most energy efficient products for private households. Products recommended are high quality, affordable, value for money and low environmental impact. Assessment uses existing criteria, such as

[53] Homestars. See www.homestars.ca

[54] Canada Mortgage and Housing. See www.cmhc.ca

[55] EcoTopTen. See http://www.ecotopten.de/projekt_englisch.php

ecolabel schemes, as far as possible. Additionally, EcoTopTen works with consumers and industry to develop product innovations, which are accessible to all interested companies.

The housing industry value chain is made up of a variety of different groups, as shown in Figure 5 above. The process of developing the trusted information education strategy will require the information needs of these different groups to be considered, as they will need different types of information depending upon their role in the value chain. In addition, some groups along the value chain will need to provide trusted information for groups further down the chain. For example, design professionals will need to provide information for builders on sustainability features; similarly manufacturers will need to provide information for builders and home occupiers on the appropriate installation, use and ongoing maintenance of products designed to improve home sustainability.

The following information will need to be identified for each group in the housing industry value chain:

- Who the information provider is?
- Who checks the information?
- Who are the end-users of the information?
- What type of information is needed by the end-user? (it is assumed that different stakeholder groups will require different types of information from performance comparisons and cost information, to installation, maintenance and disposal information)
- In what form would the information best be provided? e.g. certified labels, performance information provided by manufacturer/ government/ independent groups
- What would make that information trusted within that group?
- How does the end-user tell trusted information from promotional or out-dated information?

9.5 Audience

The audience for trusted information is the end-user of the information. Some groups in the value chain will be simultaneously information users and producers.

10 SUMMARY AND CONCLUSIONS

A wide range of potential market transformation interventions could be considered to attempt to drive change in the New Zealand housing industry, to meet Beacon Pathway's goals and the high standard of sustainability. These interventions could approach market transformation from a variety of angles – from market based mechanisms to standards and regulation to providing information and education. The literature on market transformation highlights the finding that no single measure or instrument can achieve a sustainable change of the market. An effective intervention programme will need to involve a mix of instruments including policy, economic instruments and education.

For this study an exhaustive "long list" of potential interventions was drawn from a variety of sources. It was then considered by a working group of market experts, with experience in transforming a range of markets. The working group followed a rigorous process to reduce the "long list" to a short list of 20 interventions. From the short list, four key interventions were developed, which the market experts thought would have the most potential to transform the New Zealand housing market.

The following four key interventions were proposed:

- National Value Case. The National Value Case is a high quality publication that explains the national benefit to be gained by transforming the NZ housing stock to improve sustainability of homes. The purpose is to provide government with the opportunity to participate in commercial interventions by providing the business case for the removal of regulatory barriers and investment in sustainable housing.
- Voluntary "WOF for every house" rating tool. The "WOF for every house" is a commercial intervention that builds on the Beacon high standard of sustainability by applying a voluntary environmental performance rating tool at point of sale of houses. It can also be used by tenants in choosing rented property, by banks to make mortgage decisions, by insurance companies to set premiums, and by councils to set rates. The purpose is to stimulate the demand for the environmental technologies and solutions and, in turn, stimulate the development of new products and services.
- Council rates based on environmental performance. The "WOF for every house" house rating tool will create a voluntary housing market based on environmental performance and provide the opportunity for proactive councils to pilot rates that include a factor based on the Beacon high standard of sustainability. This rewards early adopters of the "WOF for every house" house rating tool and aligns with council obligations under the Local Government Act 2002 and other national policies currently under review.
- "Trusted information". Trusted information is an education strategy for all stakeholders (consumers and producers) in the housing industry. The voluntary "WOF for every house" and related commercial developments create the need for information, especially comparative and locally-relevant information. "Trusted information" focuses on "smart" information tools that respond to stakeholder needs through signposting existing sources of information and providing decision-making tools to assist stakeholders to navigate and select relevant information for their needs.

The National Value Case intervention has already been agreed by Beacon, and work has been commissioned to further develop the intervention. The other three interventions will also require further work before they can be implemented.

The four key interventions complement or contribute to the Beacon high standard of sustainability (HSS). The National value case and Trusted information complement the HSS. The "WOF for every house" house rating tool and Rates based on performance should incorporate the HSS targets in their design, measurement and reporting.

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LINZ (New Zealand). See www.linz.govt.nz/home/index.html

Long term Agreements (The Netherlands). See www.technology.novem.nl/en/

Low-Income Home Energy Assistance Programme (HEAP) (USA). See www.otda.state.ny.us/otda/heap/default.htm

Market Transformation Programme: Supporting UK Government Policy on Sustainable Products. See www.mtprog.com/Background.aspx.

Nationwide House Energy Rating Scheme NatHERS (Australia). See www.nathers.gov.au/index.html

Programme for Improving Energy Efficiency on Energy-Intensive Industries (Sweden). See www.stem.se/WEB/STEMEx01Eng.nsf/F_PreGen01?ReadForm&MenuSelect=F78F2B2CB1DE4525C12570FB00428BD8&WT.Ti=Programme%20for%20energy%20efficiency,%20industries

Property Check (New Zealand). See http://realestate.t5.co.nz/property-check.html

Quotable Value (New Zealand). See https://www.qv.co.nz/

Smart Communities Network, Green Buildings Energy Rating Systems (USA). See www.smartcommunities.ncat.org/buildings/gbprogrm.shtml.

STEPS (Australia). See www.morelandsteps.com.au/links.html

Sustainable Consumption and Production (SCP) Initiatives, United Nations Department of Economic and Social Affairs (DESA) and United Nations Environment Programme (UNEP). See http://webapps01.un.org/dsd/scp/public/Welcome.do

Sustainable Consumption Research Exchange (SCORE) (Germany). See www.score-network.org/

Sustainable Energy: Energy Efficiency Commitment (UK). See www.defra.gov.uk/environment/energy/eec/index.htm

Sustainable Operations on the Government Estate (UK). See www.sustainable-development.gov.uk/government/estates/index.htm

TUSC (New Zealand). See www.tusc.org.nz/index.cfm/home

US Environmental Protection Agency and US Department of Energy, ENERGY STAR. See www.energystar.gov/

US Resource Conservation and Recovery Act (RCRA). See www.epa.gov/region5/defs/html/rcra.htm

WashWise, US Northwest Energy Efficiency Alliance. See www.nwalliance.org/

Water Efficiency Labelling and Standards (WELS) Scheme (Australia). See www.waterrating.gov.au/

Westpac Green Home Loan (Australia and New Zealand). See www.westpactrust.co.nz/olcontent/olcontent.nsf/Content/23+March+2007

APPENDIX A: CONCEPTUAL "TUBE MAP" OF THE NEW ZEALAND HOUSING INDUSTRY

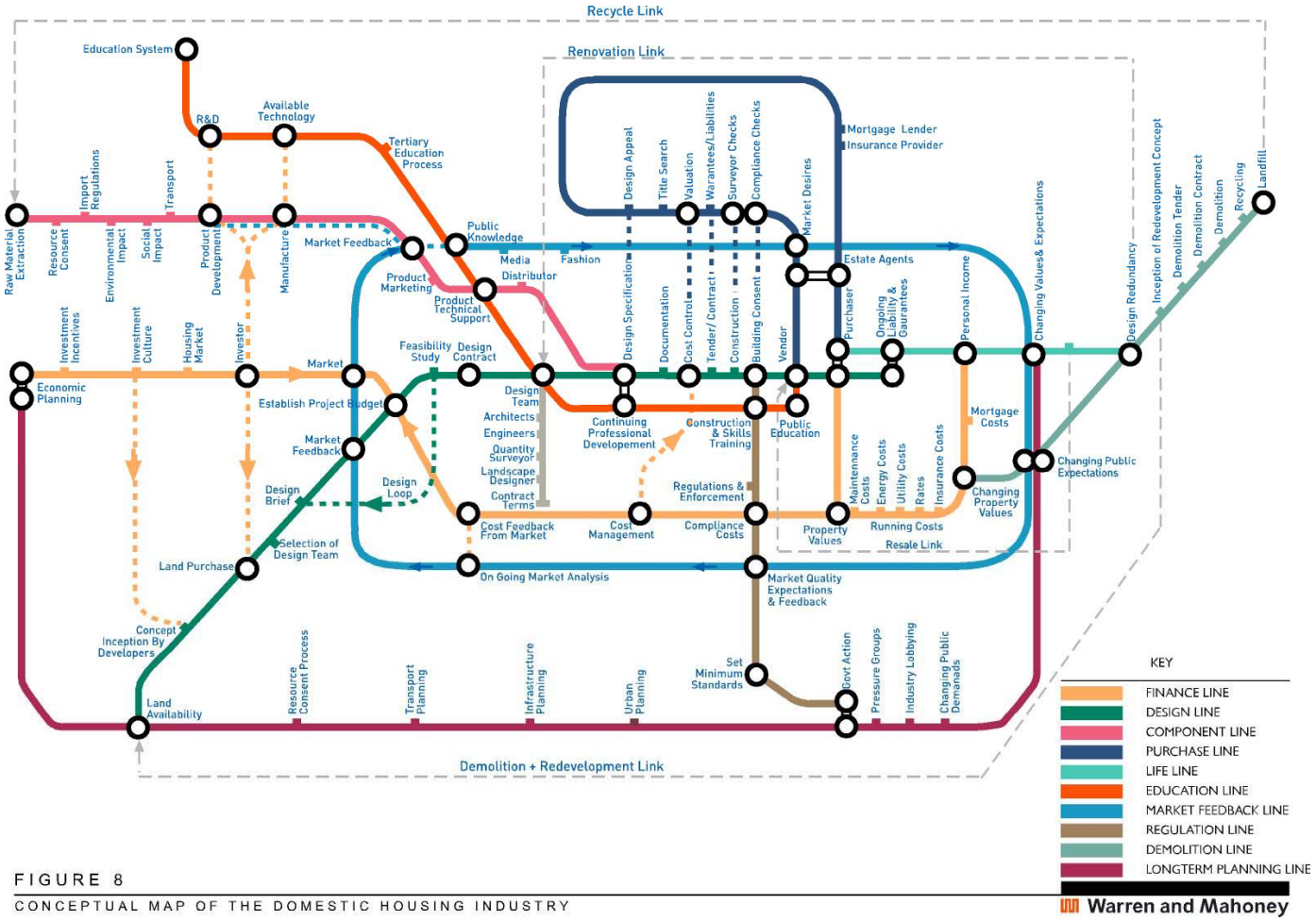

FIGURE 8

CONCEPTUAL MAP OF THE DOMESTIC HOUSING INDUSTRY

Warren and Mahoney

APPENDIX B: EXAMPLE: INTERVENTIONS DEVELOPED FOR DESIGN LINE

Land availability	Concept inception by developers	Land purchase	Selection of design team	Design brief	Market feedback
Only sustainable development and contain sprawl	Education of developers Mandatory step requiring dialogue between planners and developers Emphasising market potential	Consent and other incentives for developers including sustainable design and environmental performance criteria Prefer land where sustainable infrastructure already present Taking environmental risk into account	Register of sustainable practitioners - offering sustainable solutions part of licence to operate Terms of engagement - include things like energy modelling	Publication of standard design briefs for sustainable residential buildings	Assessing whether realistic with advisors on board Built examples for new and retrofit Surveys
Establish project budget	**Feasibility study**	**Design contract**	**Design team**	**Design specifications**	**Documentation**
Incentives based on inclusion of sustainable design, whole life costing and use of sustainable materials	Most effective time to change the design brief - stakeholders involved Prototype retrofit packages for types of house - based on age of property and location Prototype home	Terms of engagement	Sustainability credentials	Minimum environmental performance standards for new and retrofit design packages - energy efficiency, water conservation, indoor air quality, waste minimisation, recycled material content Recognised sustainability tests and principles used in design specifications Standard specifications revised for sustainability goals Building code - approved documents More builders use the NZ3604 standard	Manual detailing environmental critieria and performance of materials, fixtures & fittings for new house or retrofit package plus running and maintenance instructions for optimum performance

				BRANZ advisory documents	

Cost control	Tender/Contract	Construction process	Building consent	Vendor	Purchaser
Preferable and subsidised prices for products Standard information Whole life costing	Standard tendering and contract clauses Procurement policies	Monitoring what goes on during construction, certification schemes, materials assurance Registered builders and trades	Check for compliance e.g. of insulation envelope, environmental certification Incentives for design features such as source control of stormwater	Environmental performance and features including in the marketing	Operational manual Monitoring

Ongoing liability & guarantees
Apportioning liability for environmental performance back to developers, certifiers etc

APPENDIX C: INTERVENTIONS SORTED BY DRIVER

Central Government

- International agreements
- Adopt international standards e.g. OECD
- National policy - Building Act, Rating Act, Tenancy Act, Local Government Act
- Identify where changes to central government legislation needed to facilitate sd goals to make it easier for green councils to achieve their goals
- Guide central government e.g. urban affairs portfolio
- Influence building code review
- Identify and remove regulatory barriers
- Build the value case for stronger regulation
- Stimulate availability of new technologies not yet available in NZ
- Government procurement policies - any government buildings to meet sustainability
- A national policy intervention to create more sustainable housing

Economic

- Reduced capital gains tax for investors
- Aggregates tax - taxes on use of virgin materials
- Tax incentives for home investment on PAYE
- Move from income tax to consumption tax
- Taxes based on product miles
- Taxes based on transport impacts
- Taxes on construction waste and end-of-life appliances, fixtures and fittings going to landfill
- Double price of electricity through a special tax
- Tax or levy on all existing houses for unsustainability and concessions for sustainable improvements
- Taxes on bad materials
- Subsidies for including sustainable features or materials
- Subsidies for low energy technologies
- Preferable and subsidised prices for products
- Subsidies for developing sustainable materials, products and services or for adopting product stewardship
- Subsidised packages for DIY
- Subsidise recycling centre set-up
- Incentives based on inclusion of sustainable design, whole life costing and use of sustainable materials
- Incentives for design features such as source control of stormwater

- Incentives to use recycled materials
- Incentives for sourcing building materials within New Zealand
- Incentives for sustainable design
- Incentives for companies with environmental management and social responsibility credentials
- Incentives for retailers increasing range of products and services with environmental credentials
- Incentives for companies that include sustainable design in their R&D programmes
- Incentives for sustainable design of products
- Incentives for recycling, product stewardship and use of recycled materials
- Incentives for disassembly rather than demolition
- Incentives for recovery of reusable and recyclable materials
- Incentive programme to reward people/landlords for improving houses
- Funding ways to make it easy for people to do

Local Government

- Rates based on performance not area of structure
- Incentives for achieving a certain rating or certification based on environmental features and performance - with 5 year renewal period
- Reduction in building and development levies
- Reduced compliance costs where sustainability criteria achieved
- Zero compliance costs for retrofitting
- Check for compliance e.g. of insulation envelope, environmental certification
- Post completion inspection for new and retrofit where consent needed
- Favourable treatment where sustainable materials and components specified in application
- Culture for going beyond compliance and include sustainability criteria in compliance checks
- More flexible consideration of new technologies i.e. not mandating established technologies
- Removal of compliance barriers for sustainable technologies i.e. low water use fittings
- Support for companies developing new sustainable materials and products ensure that sensible retrofitting is not restricted
- More enforcement where poor environmental performance, increased regulations, well publicised
- Sustainable urban planning
- Developments with sustainable design covenants
- Shared infrastructure, shared utilities, local generation, recycling facilities, community heating systems, localised sewage treatment
- Upgrade subdivision plans/codes of practice in district plans
- Mandatory step requiring dialogue between planners and developers
- Prefer land where sustainable infrastructure already present
- Consent and other incentives for developers including sustainable design and environmental performance criteria
- Holistic subdivision design

- Pedestrian, cycling, parking, car-free neighbourhoods, car-pooling in developments, cycling facilities, public transport links
- Sustainability requirements/ measurements as part of resource/ development consent process
- Stringent boundaries to contain urban sprawl, only allow sustainable development.
- Taking environmental risk into account
- LGA – specific responsibility – to improve SD – legal duty

Statutory

- Rating tools at point of sale
- Manual or passport required at point of sale detailing environmental, health and safety features and performance
- Standard specifications revised for sustainability goals
- Minimum environmental performance standards for new and retrofit design packages - energy efficiency, water conservation, indoor air quality, waste minimisation, recycled material content
- Measures that require disclosure and traceability of materials
- Measures to limit imported materials from non-sustainable sources or containing undesirable materials related to use and disposal
- Measures that require disclosure of environmental impacts of materials and components
- Measures that require disclosure of social impacts of materials and components
- Measures that require disclosure of product miles
- Environmental performance criteria in product, services, design and quantity specifications where retailers provide quotes for new and retrofit packages
- WOF for every house
- Warm homes scheme mandatory
- Mandatory measurements such as air quality, moisture etc
- Mandatory sustainability rating or certification to get building consent
- Standards for mandatory features e.g. installation of insulation
- Selected environmental features and performance included on title
- Apportioning liability for environmental performance back to developers, certifiers etc
- Building code - approved documents
- More builders use the NZ3604 standard
- Legislation penalising unsustainable manufacturing and building processes, products and services
- Minimum health and sustainability standards

Voluntary

- Register of sustainable practitioners - offering sustainable solutions as part of licence to operate
- Sustainability credentials
- Registered builders and trades
- Certified green builders - qualifications checked by inspectors
- Sustainability criteria included in standards for trades

- On-site inspection of skills for trades
- Encourage industry to develop voluntary sustainability performance standards
- Include sustainable design i.e. terms of engagement include items such as energy modelling as standard in specifications
- Publication of standard design briefs for sustainable residential buildings
- Most effective time to change the design brief - stakeholders involved
- Terms of engagement
- Recognised sustainability tests and principles used in design specifications
- Sustainable design in relevant professional curricula
- Ongoing responsibility for performance of builders work
- Standard tendering and contract clauses
- Procurement policies
- Monitoring what goes on during construction, certification schemes, materials assurance
- Stimulate link between small investor and sustainability i.e. star schemes or rating
- Incentives for branding and labelling linked to third-party verification of environmental and social responsibility
- Drive to increase number of NZ products with Environmental Choice Label
- Rating or certification schemes to verify vendor's claims
- Selected environmental features and performance included standard survey procedures
- Ecolabelling for houses
- Whole life costing applied to valuation - running costs and maintenance liabilities included in valuation
- Minimum sustainability content in curricula and minimum sustainability competency
- Establishment of values, benchmarking
- Pressure groups focus their activities, linking them to corporates
- Position sustainable houses as a recipient of carbon credit revenues
- Incubator - provide funding for new business startups

Commercial

- Green mortgages - better lending rates for properties that meet sustainability criteria
- Reduced costs for rearranging mortgage to introduce energy efficient technologies or to retrofit to an accepted sustainability package
- Lower borrowing rates or access to larger amounts of finance for properties with or to install better environmental features and performance
- Relating running costs to the property value and mortgage available
- Low interest rates for sustainable construction
- Lower insurance premiums for less flammable, less flood prone properties, safer, healthier properties
- Lower premiums for features and materials that improve health and safety
- Low interest loans for insulation etc linked to health industry

- Targeted low interest loans for energy efficiency
- Lower insurance for companies with environmental management systems and waste reduction schemes.
- Stimulation of refurbishment market
- Development of a series of cost effective packages for retrofit
- Availability of products or services - creating competition
- Higher cost housing - environmental features become smaller percentage cost element
- Over-stimulation of housing market e.g. through immigration creating more demand than there is supply
- Stimulating higher quality houses in the market due to better standards or media trends
- Stimulation of investment in companies building more sustainable houses due to increase in interest in ethical investment
- Linking the costs of utility and maintenance costs to investor
- Apportioning liability for environmental performance back to developers, certifiers etc
- Whole life costing
- Availability of clean power sources
- Energy provider providing technology and consumer paying through savings on bills
- Buy back schemes for energy generated by house
- Sustainability tests and principles included in tender documents
- Water metering, wastewater metering, stormwater metering
- Using industry advisors to assess whether ideas arising from the market are realistic
- Environmental features and performance in marketing materials and reporting
- Sustainability criteria included in mainstream market research
- Normalising the market - mainstreamed
- Green is the new black
- Re-brand sustainable development and green and make it mainstream
- Flexible, retrofit function & aesthetics
- Develop designs for adaptability
- Improve access to sustainable and healthy materials
- Certification for new, reused, recycled products by a Government agency

Education

- Raising awareness and knowledge of investors - good investment payback information
- Raise public awareness including information on reduced costs and risks - make it easy to get advice - BRANZ advisory documents
- Reporting that compares standard property value and running costs with properties that have environmental features and/or better environmental performance
- Consumer organisations provide information on financial benefits of sustainable features, technologies, performance including market potential.
- Surveys – investment returns on properties with environmental features and performance.

- Readily available comparative information on the cost benefits of retrofit components i.e. underfloor insulation vs loft insulation vs double glazing vs heat pumps etc
- Increased sources and amounts of trusted information about products and services, and on performance and cost benefits of sustainable design and retrofit.
- Recognised lists for environmentally preferable materials, fixtures & fittings, components, services.
- Re-educate purchaser about sustainable features using language that emphasises the LOHAS benefits.
- Customer preference for sustainable companies – index
- Guides to sustainable DIY.
- Built examples for new and retrofit
- Prototype new home
- Prototype retrofit packages for different types of house - based on age of property and location
- Partner with willing councils and developers to create prototype neighbourhoods
- Leaders, champions, demonstration project stimulate market to change
- Create professional advisors with knowledge
- Research and reporting on statistics that show premiums going down when claims go down.
- Social identity for sustainable dwellers
- Make unsustainable houses socially unacceptable
- Understand cultural imperative for sustainable housing
- Stories (personal experience), case studies and demonstration examples of sustainable design, features and performance widely promoted and available.
- Information, values, incentives, costs of demolition
- Standard information for every house detailing environmental criteria and expected performance of materials, fixtures & fittings for new house or retrofit package plus manual with running and maintenance instructions for optimum performance
- Surveys – public knowledge about sustainable housing.
- Surveys – numbers of houses meeting environmental performance standards.
- National monitoring on actual performance of houses.
- Reporting system from householders to central government.
- Feedback on environmental and social performance included in mainstream consumer information in all types of media
- Reporting that compares standard property with properties that have environmental features and/or better environmental performance
- Practical user-friendly web-resources for people to do their own self-assessment.
- Programme of health monitoring related to quality of houses.
- Changing public demand for LOHAS (lifestyle of health and sustainability) through media.
- High profile people attached to sustainability message
- Popular magazines, media, make-over programmes, websites, retailers feature case studies, experiences demonstrating benefits of sustainable design, technologies, features, practices, behaviour

- Educating public about issues e.g. leaky homes, asbestos so that market demands higher quality through regulation.
- Refocus consumer perspective on benefits through consumer targeted media campaign with supporting educational material.
- Profile the benefits of living in a sustainable house - profile changes required to get the benefits.
- Sustainable homes and gardens show/expo
- Annual awards scheme for sustainable residential retrofits
- Community challenge for sustainability
- Sustainable production and consumption in general education syllabus.
- Sustainability criteria included in CPD programmes.
- Sector-specific educational packages freely available.
- Sustainability in professional development courses e.g. engineers, planners.
- Education of builders.
- Guides for trades.
- Programmes to encourage people to become builders - raise status of the profession
- Market Beacon as a leader and as a hub for information
- Educate developers and purchasers.
- Educate: landlords – develop a green landlords scheme with recognition.
- Educate real estate agents, surveyors, valuers, mortgage lenders.

APPENDIX D: INTERVENTION WORKING GROUP NOTES

Beacon Pathway
Market Transformation
Interventions Working Group Notes
Vintners Retreat, Blenheim, 6-7 June 2006

Beacon Pathway
Beacon Pathway Ltd is a collaborative research consortium of organisations with a considerable stake in the quality of the residential sector - Building Research, Scion, Waitakere City Council, Fletcher Building, and New Zealand Steel. Shareholder contributions are matched, dollar for dollar, by funding from the Foundation for Research, Science & Technology (FRST).

Beacon's goals are:

- To help bring the vast majority (90%+) of New Zealand homes to a high standard of sustainability by 2012
- To ensure that every new or redeveloped subdivision or neighbourhood, from 2008 onwards, is created with reference to a nationally recognised sustainability framework

Through the research to date, the high standard of sustainability has been defined as objectives around the five issues of energy, water, indoor air quality, materials and waste.

Market Transformation

Market transformation is a process, or catalyst for change, for intervening in markets to bring about long-term changes to improve market performance with respect to energy efficiency. More recently, market transformation programmes have focused on wider environmental and social performance issues. We believe that a market transformation strategy can be devised to promote the manufacture, purchase and use of sustainable products and services for the housing sector.

The aim of our market transformation research is to induce lasting structural and behavioural changes in the marketplace, resulting in increased adoption of sustainable technologies. A key aspect of market transformation is removing market barriers that inhibit the manufacture and purchase of sustainable technologies and creating the motivation for ongoing use.

Working Group

The aim of the working group is to identify and develop market transformation options or interventions for driving demand and supply of features and initiatives that will significantly improve the sustainability performance of new and existing housing in New Zealand. Although the main challenge we face is transforming the existing housing stock, some 100,000 houses yet to be built will be existing stock in 2012.

Potential interventions have been drawn from a review of overseas market transformation examples, from the Beacon Pathway's own research programme, and from a workshop of housing industry representatives held in 2004. Prioritisation of the interventions will take into account the Beacon 90% goal and the strategic initiatives that will move Beacon towards the high level of sustainability – energy efficiency, water efficiency, indoor air quality, waste and materials.

To develop these interventions, we have brought together a small group of individuals who are passionate about achieving a sustainable future for New Zealand. We have deliberately included individuals who are not experts in the housing industry in order to facilitate thinking "outside the box".

On Day 1, you will each select (using agreed filters) your top 5 interventions from each of the groups of interventions (provided and including any others you may add).

On Day 2, you will select 3 of the prioritised interventions closest to your expertise and further develop them (against agreed development points).

So that you can prepare, we will provide in advance a summary of overseas market transformation initiatives (including housing) plus summaries of the learnings from our NZ work with consumers, industry associations and industry. We will also provide information about the team that we are bringing together for the two-day working group.

Arrangements for the two days

We have booked accommodation, a work room and catering for 6-8 individuals at The Vintner's Retreat, just 5 minutes from Blenheim airport.

Coffee/tea and something to eat will be provided on arrival on day 1.

Coffee/tea and a fruit bowl will be available throughout both days.

The Tuesday evening meal has been booked at The Vintners Retreat restaurant on site.

Please inform us if you have any special dietary requirements.

For further information, please contact:

Ann Smith
03 325 6701 X2304 (W)
027 229 9079 (M)
03 329 9063 (H)
smitha@landcareresearch.co.nz

Working Group programme

Beacon Pathway – Market Transformation Interventions Working Group Programme

The Vintners Retreat, Blenheim, 6-7 June 2006

WORK PROGRAMME – DAY 1

10.00 Introductions

10.30 The Beacon Pathway – Nick Collins
The Beacon Goal
The Beacon High Level of Sustainability

Discussion

11.00 Market Transformation – Ann Smith

Market Transformation and Energy efficiency

Market Transformation and Housing

Discussion

11.30 Market segmentation – Nick Collins
The New Zealand housing stock and its condition

Discussion

12.00 Interventions – Ann Smith

Introduction to the work plan – agree filters

Discussion/clarification

12.30 LUNCH

13.30 Central government and economic instruments
14.00 Report back and discussion

14.30 Local government and regulatory interventions

15.00 Report back and discussion

15.30 Voluntary and Education interventions

16.00 Report back and discussion

16.30 Commercial interventions

17.00 Report back and discussion

17.30 Reflection and finalise short list of interventions for day 2

19.00 SUPPER

The Vintners Retreat

www.vintnersretreat.co.nz/

Conference and Events Centre

190 Rapaura Road

Blenheim

MAIN FILTER

- Proportion of New Zealand housing stock likely to be affected
- Contribution likely to the Beacon Goal

SECONDARY FILTER

- Has it been done elsewhere?
- Was it successful or not?
- Would it work in New Zealand?
- Can it be done cost effectively?
- Can it be done easily and quickly?
- Risks?

WORK PROGRAMME – DAY 2

09.00 Day 2 work plan

Any additional information requested

– Nick Collins, Ann Smith, Graeme Finlay

Clarify work plan for Day 2

Prioritised interventions - agree development points

09.30 Interventions 1

10.00 Report back and discussion

11.00 Interventions 2

11.30 Report back and discussion

12.30 LUNCH

13.30 Interventions 3

14.00 Report back and discussion

15.00 Reflections and where next

16.0 FINISH

DEVELOPMENT OF INTERVENTIONS

- Proportion of housing stock affected
- Segment affected e.g. owner vs rental and new vs retrofit)
- Contribution to Beacon high level of sustainability (energy, indoor air quality, water, waste, materials)
- Programme and timescales
- Quick wins vs longer term goals
- Key players and stakeholders
- Are they likely to be motivated?
- What are the likely barriers?
- What unique New Zealand factors need to be considered?
- Information and data requirements
- How will we measure success?
- Will it deliver other goals? e.g. health
- What drivers, incentives needed?
- How and who would fund it?
- Risks and dependencies?
- How does it contribute to New Zealand plc?
- What are the business opportunities?

PARTICIPANTS

- Nick Collins, general manager, Beacon Pathway, www.beaconpathway.co.nz/
- Graeme Finlay, architect, Warren & Mahoney, www.wam.co.nz/
- Nick Gerritsen, start-up expert, knowledge broker, Crisp Start, www.crispstart.com/
- Murray Griffin, community development, Department of Internal Affairs, www.dia.govt.nz/diawebsite.nsf
- David Grimmond, economist, Infometrics Ltd, www.infometrics.co.nz/
- Roelant Hofmans, mortgage manager, Mike Pero Mortgages, www.mikepero.co.nz/mortgages/index.cfm/Home
- Toni Owen, chair person, Eastern Bay Energy Trust, www.ebet.org.nz/index.asp
- Ann Smith, business and sustainability advisor, Landcare Research, www.landcareresearch.co.nz
- Cerasela Stancu, business and sustainability advisor, Landcare Research will be available as record keeper for the two days

APPENDIX E: 20 SHORT-LISTED INTERVENTIONS AND EXAMPLES OF INTERNATIONAL APPLICATION

SHORT-LISTED INTERVENTIONS	EXAMPLES OF INTERVENTIONS INTERNATIONALLY
Strategy to influence national policy	• *One Million Sustainable Homes* a World Wildlife Fund - UK initiative working with the UK government, industry and consumers to develop one million sustainable homes by 2012. www.wwf.org.uk/filelibrary/pdf/OMSHbrief.pdf • Oxford University has investigated with it's 40% house project how the UK Government's commitment to a 60% cut in carbon emissions from 1997 levels by 2050 can be realised in the residential sector, so that the typical home becomes a '40% House'. www.eci.ox.ac.uk/lowercf/40house.html
Identification and removal of regulatory barriers	• The Canadian Home Builders' Association in its submission on Canada's Industry Innovation Strategy identified several regulatory barriers and proposed actions to remedy these. http://innovation.gc.ca/gol/innovation/site.nsf/en/in02277.html • The *Better Building – Better Lives* report of the Sustainable Building Task Group advises the UK Government on practical and cost effective measures to improve sustainability of buildings. www.dti.gov.uk/files/file15151.pdf • The *Sustainable Housing Solutions* report identifies key elements of the process of transferring sustainable housing solutions from the margins to the mainstream, also outlining how existing barriers can be reduced. Building and Social Housing Foundation 2002. *Sustainable Housing Solutions*. Coalville, UK: BSHF. • According to *Locked Out*: The impact of local regulation on affordable housing' regulatory barriers and delays have increased home costs by 25% in the US. This report attempts an open discussion of affordability of houses in the Charlottesville area and its relationship to regulation. www.freeenterpriseforum.org/documents/lockedout.doc

National Value Case	• *Visionary Leadership in Housing*, a joint publication from the Chartered Institute of Housing and Local Government Association argues for a renaissance of the local authority's strategic housing role - one that is different from in the past - and a new breed of housing professionals to deliver it. It makes recommendations for a new national framework to deliver this enhanced role. • The Californian Sustainable Building Task Force reported on the costs and financial benefits of green buildings and found that an upfront investment of less than 2% of construction costs yields in over ten times the initial investment in life cycle saving. www.ciwmb.ca.gov/greenbuilding/Design/CostBenefit/Report.pdf
Government procurement (i.e. sustainable procurement by government influencing the supply chain)	• Canadian Government sets out guidelines for federal employees to help reduce the impact of government operations by promoting and following green procurement practices. It also provides a Government of Canada Green Procurement Network, which is accessible to federal government employees only and an array of tools and options to help departments and agencies in the greening of their operations. www.greeninggovernment.gc.ca/ • The UK Government has had a greening of government programme for some years. Now referred to as Sustainable Operations on the Government Estate. Government departments have outcome-focused targets that set a common agenda for central Government on a number of priority areas for action. They will drive a significant step-change improvement in the way that Government manages its land and buildings sustainably. www.sustainable-development.gov.uk/government/estates/index.htm • The US Resource Conservation and Recovery Act (RCRA), requires federal agencies to "give preference in their purchasing programs to products and practices that conserve and protect natural resources and the environment." www.epa.gov/region5/defs/html/rcra.htm
Incentives (taxes and subsidies) – sticks and carrots	• The Policy Studies Institute produced *A Green Living Initiative: Engaging Households to Achieve Environmental Goals* on fiscal incentives for sustainable homes and puts forward an integrated package of measures, linking tax incentives to clear information, advice and branding, designed to engage households in taking action on three key environmental issues – energy, water and waste. www.green-alliance.org.uk/grea_p.aspx?id=328

a) For physical changes (e.g. solar hot water)	• California million solar roofs plan – became official legislation in August 2006, providing up t o $US 3.35 billion rebates on solar power systems, also giving customers the option to sell their excess solar power generation back to the power provider www.environmentcalifornia.org/energy/million-solar-roofs • Germany's 100,000 roofs project provided a 10-year low-interest loan for private PV installations. Germany now leads the way with an Electricity Feed-in Law that started in 1999, which permits most customer applications to receive 45.7 euro cents per kilowatt-hour (kWh) (56¢ per kWh) for solar-generated electricity sold back to the grid. By the end of 2003, German installed capacity was 400 MW, well beyond the initial goal of 300 MW. www.senternovem.nl/mmfiles/The%20100.000%20Roofs%20Programme_tcm24-117023.pdf
b) For behavioural changes (e.g.) – switching off appliances when not in use	• The *Save Cash and Save the Planet* guide published by Friends of the Earth provides dozens of tips on how small changes to people's lifestyle can help reduce emissions of carbon dioxide while saving cash at the same time. www.foe.co.uk/living/save_cash_save_planet/ • Energy Savers provides homeowners with tips for saving energy and money at home and on the road. By following just a few of the simple tips found on this Energy Savers Web site, you can make your home more comfortable and easier to heat and cool—while you save money. We bring you the latest information on energy-saving, efficient technologies. We even give tips for using clean, renewable energy to power your home. www1.eere.energy.gov/consumer/tips/
Packages and funding for retrofit and DIY	• The UK Government funds schemes providing up to £2,500 to households on certain benefits to improve their heating and energy efficiency. In England the scheme is known as Warm Front, in Northern Ireland it is Warm Homes, in Scotland Warm Deal and in Wales it is the Home Energy Efficiency Scheme. www.est.org.uk/myhome/gid/
Rates based on environmental performance of the house (based on the Beacon high level of sustainability – energy, water, IEQ, waste and materials)	• The Governor of New York developed a plan cut New Yorks dependency on imported energy, including a new $500 tax heating credit for lower-income seniors; a $50 million increase in Low-Income Home Energy Assistance Program (LIHEAP) benefits, and a new tax credit for homeowners who upgrade to a high-efficiency home heating system. www.otda.state.ny.us/otda/heap/default.htm

Reduced levies/costs for consent/compliance where sustainability technology/solutions delivered	• A UK guide for residential developers with an overview of business benefits and opportunities that can be obtained by thorough consideration and implementation of sustainability. It also illustrates that this approach can contribute to long-term commercial success including reduced compliance costs www.pdmconsultants.co.uk/filemanager/developers_guide-2.CV.pdf .
Warrant of Fitness for every house at point of sale	• The Research from Communities in Scotland report on proposed housing quality standards defines indicators for housing quality to be implemented for a proposed Housing Quality Standard in Scotland. www.communitiesscotland.gov.uk/stellent/groups/public/documents/webpages/cs_006672.hcsp • A BioRegional Development Study investigates how existing EcoHomes schemes might be developed into a scheme covering all homes. www.defra.gov.uk/environment/consumerprod/accpe/research/pdf/accpe_final030711.pdf
Compulsory water metering	• Many European countries charge for the provision of fresh water and the discharging of waste and stormwater. For example the Swiss Water Protection Act (Gewässerschutzgesetz) obligates local authorities to treatment fresh and wastewater and entitles the communities to charge rates to cover the treatment and distribution costs. www.admin.ch/ch/d/sr/814_20/index.html#id-2-1
Performance standards and reporting including surveys of houses, energy and water audits – for new and retrofit	• The Research from Communities in Scotland report on proposed housing quality standards defines indicators for housing quality to be implemented for a proposed Housing Quality Standard in Scotland. www.communitiesscotland.gov.uk/stellent/groups/public/documents/webpages/cs_006672.hcsp
Certified professions and trades	• The Green*Plumbers*® initiative is a Climate Protection Project, supported by the Federal Government's Australian Greenhouse Office. Green*Plumbers*® are promoting more environmentally sustainable ways of operating with the aim to reduce Greenhouse Gas emissions, through promoting the increased use of energy-efficient appliances. www.greenplumbers.com.au/ • Australia's Green Building Council offers a list of accredited professionals on their web site, please check: www.gbcaus.org/gbc.asp?sectionid=74&docid=941
Sustainability tests and	• Sustainable Housing Design Guide for Scotland is intended to provide comprehensive

principles used in design specifications, terms of engagement, standard design briefs/ tendering/contract clauses	and user friendly guidance to the incorporation of sustainability principles into maintaining, rehabilitating and developing housing www.communitiesscotland.gov.uk/stellent/groups/public/documents/webpages/cs_006672.hcsp
Incentives for branding and labelling (e.g. ecolabel for houses)	• France introduces compulsory energy label for in July 2006. www.transporttrends.com/mvnforum/mvnforum/viewthread?thread=1329 • Germany also has a number of eco home labels, for more information please refer to: www.ba.itc.cnr.it/sksb/PAPERS/33-33o.pdf#search=%22eco%20labeling%20for%20homes%22
Green financial tools (e.g. green mortgages, more mortgage available if running costs lower, lower insurance premiums etc)	• Fannie Mae, largest US home mortgage lender encourages wise energy use while rewarding the homeowner financially. Their Energy Efficient Mortgage scheme (EEM) recognizes the savings value of energy conservation in the loan evaluation process allowing lenders to use this monthly savings to qualify a borrower for a larger mortgage. www.natresnet.org/lender/lhandbook/fnm_990610.htm • Green mortgages - UK CO-OP BANK introduced its green mortgage scheme in 2002 offsetting a part of the CO_2 emissions produced by each household that is financed by a CO-OP Bank mortgage. www.co-operativebank.co.uk/ • The Australian and New Zealand Westpac Bank green mortgage schemes offer a discount on a variety of environmentally friendly products for anyone who chooses a Westpac home, investment or equity loan. www.westpac.com.au/ and www.westpactrust.co.nz/olcontent/olcontent.nsf/Content/23+March+2007
Rebranding sustainability, normalising and mainstreaming (e.g. black is the new green)	• The *Sustainable Housing Solutions* report identifies key elements of the process of transferring sustainable housing solutions from the margins to the mainstream, also outlining how existing barriers can be reduced. • Painting the Town Green, a Green-Engage initiative looking at how to persuade people to become environmentally friendly. Hounsham S 2006. *Painting the Town Green.* London: Green-Engage.

Funding through utilities (e.g. pay back of new technology costs through savings, utilities pay for power going back into grid)	• Renewable Energy Act – obligates all lines companies in Germany to buy back all energy generated from renewable energy sources to specified prices. www.solarserver.de/solarmagazin/eeg_04.pdf
Education strategy (across all age ranges) including education and support for sector and community groups	• UK Government introduced a "Learning for the Future – Sustainable Development Action Plan" as part of their national 'Securing the future' strategy. www.dfes.gov.uk/aboutus/sd//docs/SDAP%202006%20FINAL.pdf
Prototype houses, case studies, stories, feedback on performance data coming from, all sources including Statistics NZ (e.g. links to health, house prices return on investment comparing "business as usual" with sustainable houses)	• There are various examples of demonstration projects available internationally, for more information please check: *On the Path to Zero Energy Homes*, National Renewable Energy Laboratory and US Department of Energy. www.eere.energy.gov/buildings/building_america/pdfs/29915_zeb_path.pdf *Houses of the Future*, Sydney Olympic Park www.housesofthefuture.com.au/ • The Housing Forum has 125 new-built, refurbishment and maintenance projects across the UK, representing over 8,750 new build units and over 42,000 refurbished units. All of these units demonstrate innovative approaches to construction where project teams were trying to do things differently. The generic achievements are highlighted in its 'Housing Forum Demonstration Project Report. The Housing Forum 2002. *The Housing Forum Demonstration Project Report.* London: The Housing Forum.
Whole life costing (as a service)	• Sustainable accounting in the construction business, focuses on developing a method for assessing the business case for sustainable construction, specifically to identify and quantify the wider environmental, social costs and benefits associated with construction projects. Casella Stanger, Forum for the Future, Carillion plc 2002. *Sustainability Accounting in the Construction Industry.* London: CIRIA.