



BBS/15

Final report on the Build Back Smarter pilot project

**A report prepared for Beacon Pathway Incorporated
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About This Report

Title

Final report on the Build Back Smarter pilot project

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Abstract

This report outlines the progress of the Build Back Smarter Project from January 2013 through to June 2013. It focuses on the progress of the overall project against its key objectives and the process for up-scaling to a wider Build Back Smarter rollout for the Canterbury Region.

Reference

Easton, L. June 2013. Final report on the Build Back Smarter pilot project. Report BBS/15 for Beacon Pathway Incorporated.

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1 Background

The Build Back Smarter pilot project aims to develop and demonstrate a robust approach to include home performance interventions into the ‘standard’ repair of earthquake damage in Christchurch homes without:

- slowing down the city-wide rebuild process; or
- incurring additional costs other than efficient incremental labour and materials costs.

The pilot project objectives are:

- Identifying all barriers to include performance interventions into the established ‘emergency’ repair cycle
- Developing an approach (through demonstration) that addresses those barriers. The approach will seek to actively link available funders with product suppliers and installation contractors in a partnership to leverage different funds to different parts of the repair / retrofit task. The approach works within current emergency repair practice (i.e. funders/contractors/supply chain) and can be implemented in a scaled-up delivery programme.
- Evaluating the outcomes of the demonstration with reference to insurers, contractors, council and homeowners.
- Ensuring all end-users have access to the learning of the demonstration in a form that enables them to change their practice to support ‘building back smarter’ (includes engagement in demonstration, and clear documentation and synthesis of learning appropriately targeted).

1.1.1 Previous reporting

In January, an interim report on the Build Back Smarter pilot project¹ outlined: the genesis of the project; the early engagement process with insurers and their project management offices (PMOs); the development of the pilot project and the retrofit of the first of ten pilot homes; formation of and engagement with the Canterbury Sustainable Homes Working Party (CSHWP); and the process of reversing EQC’s decision around allowing wall insulation installation at the time of EQC repair.

Key findings from the interim report were as follows:

- The BBS engagement process and pilot progress to date reveals that partner insurers and their PMOs can and do accommodate modifications to repair scope to include performance upgrades. Key decisions and management occur at the level of site manager (sub-contractors) and homeowner.
- Performance upgrades are a minor addition to the “quake to repaired home”. Once repairs are underway, the Build Back Smarter additional upgrades are relatively simple and quick improvements compared to the complexity of the earthquake repairs – particularly where foundation repair is involved. All the repairs involve multiple subcontractors and adding in

¹ *Easton and Cowan (2013)*

the insulation and any other Build Back Smarter subcontractors seems to fit easily within existing processes.

- EQR's position to ban contractors from including wall insulation (a key performance intervention) has been successfully overturned. Beacon's partners, notably EECA, using its Wall Insulation Fact Bank have been able to advocate for a reversal of a decision that would have undermined an opportunity to improve Canterbury homes for at least a generation. The incidence of lining/cladding replacement is high.
- While insurance policies specify like for like and no "betterment" repairs, the system of contracting out the repair process (PMO through to sub-contractors and sub-trades at each home) has meant that homeowners are often able to negotiate directly with tradesmen to include additional work they fund themselves.

In February, Beacon held a work in progress workshop with EECA and presented pilot home status and the following synthesis of the project. If building back smarter is to become "business as usual" for Canterbury's residential repair, the following conditions need to be in place:

- Insurers enable homeowners to include performance upgrades in the repair process.
- Councils, CERA and central government agencies provide enabling environment (policies, plans, consents etc) so residents can build back smarter.
- Trades understand value of performance upgrades (so support residents considering such interventions) and are appropriately trained to deliver quality interventions (e.g. retrofitting wall insulation).
- Homeowners demand performance upgrades as part of repair.
- Transparent and robust processes are available to independently assess homes and identify performance upgrades.
- Sources of funding are available for Canterbury residents to take advantage of the opportunity to upgrade at point of repair.

In April 2013, Beacon ran a BBS workshop in Christchurch to share the findings from the project to date with Canterbury stakeholders (See Appendix One: List of participants at Beacon's Build Back Smarter stakeholder workshop April 2013). The discussion and network developed at that workshop has grown to inform this report and the activities of the Canterbury Sustainable Homes Working Party (Section 3 of this report).

2 Progress of BBS pilot project upgrades

As of June 2013, 12 homes have been assessed as part of the Build Back Smarter pilot project.

Table 1 outlines the status of each of the case study homes. In overview:

- Two homes are complete with case studies prepared (Huntsbury 2² and Halswell 1³)
- Four homes are currently undergoing repairs
- Three homes are in the PMO pipeline; due to start next quarter
- One home has pulled out (became a rebuild)
- Two homes are being actively reviewed (by Beacon) as their participation in the pilot is undermined by seemingly intractable delays.

■

² *Easton (2013b)*

³ *Easton (2013a)*

Table 1: Status of Build Back Smarter Case Study Homes at June 2013

#	House ref	Status @June-13	Household	Typology	Location	Insurer/ PMO	Upgrade Interventions	Particular Points of Interest
1	Huntsbury 2	Repair complete	Retired couple	1950s Mass Housing+ 1980s addition	Port Hills	IAG/ Hawkins	Full insulation Vapour barrier 2 windows Rangehood Hatches Heat transfer	TRS wiring \$10K worth of additional work paid for by owner
2	Halswell 1	Repair complete	Mother and three children under 16	1960s mass housing	On the flat	Hawkins/ IAG	Under floor & wall insulation Vapour barrier Solar water heating Upgrade to window replacement	Homeowner funded double glazing in new aluminium frames Retrofit solar water heating
3	Spreydon 1	Repair started Nov 2012. Owners have had a large addition built on back which has extended the repair time. No interior linings fixed yet. 6 weeks to completion	Couple	1930s bungalow [Lath and plaster linings]	On the flat	IAG/ Hawkins	Full insulation Ventilation Vapour barrier Water efficiency Rainwater tank Lighting	Water efficiency Large owner funded addition at rear.

#	House ref	Status @June-13	Household	Typology	Location	Insurer/PMO	Upgrade Interventions	Particular Points of Interest
4	Mt Pleasant 1	Lath & Plaster has been stripped out of those rooms worst affected, not all coming out. Insulation install will be smaller amount than scoped because of underfloor access difficulty. 10 - 12 weeks to completion	Couple	Villa + 2000s extension [Lath and plaster linings]	Port Hills	IAG/Hawkins	Part insulation Vapour barrier Rainwater Tank Ventilation Efficient shower Downlight replacement	Downlights Water retrofit
5	Redcliffs 1	Started Jan 2013. Re-roofing completed. Brick veneer replacement completed and waiting for delivery of new conservatory before stripping lath & plaster lining. Estimate 3 - 4 months to completion.	Rental.	1960s mass housing with more recent additions	Port Hills	Hawkins/IAG	Heat pump hot water Full Insulation Vapour barrier	House is substantially damaged Degraded TRS wiring
6	Somerfield 1	House has been lifted and foundation replacement underway. 3 -4 months to completion. Significant borer infestation to subfloor framing.	Couple with 2 kids	Transitional bungalow [Lath and plaster linings]	On the flat	Arrow/Southern Response	Full Insulation Woodburner Heat transfer Rainwater tank Lighting Double glaze 2 windows	Difficult heating situation
7	St Martins 1	Builder is currently pricing insurance repair work. May still be some issues with concrete slab repair solution. At least 6 weeks from starting	Single retired	1970s concrete floor, low pitch roof	On the flat	Arrow/Southern Response	Ceiling and wall insulation Woodburner/wetback Heat transfer Rainwater tank	Difficult retrofit technically Interesting heating/hot water solution

#	House ref	Status @June-13	Household	Typology	Location	Insurer/ PMO	Upgrade Interventions	Particular Points of Interest
8	Papanui 1	Owner signed up 1 June 2013. Builder has been allocated so good chance of starting within 6 weeks	Extended family of 2 adults, 2 children, 1 baby. 1 child has rheumatic fever.	1950s mass housing	On the flat	Hawkins/ IAG	Wall insulation Ventilation Downlight replacement	Downlights Difficult heating situation Sleepout
9	New Brighton 1	Owner signed up 14 th June.	Couple and adult son	1950s bach with 70s addition	On the flat	Hawkins/ IAG	Yet to be assessed	Yet to be assessed
10	Cashmere 1	Owners still waiting for approval or start date from Arrow. Have been advised that time is running out for BBS work. Builder still to price BBS work.	Couple	Villa + 2000s extension [Lath and plaster linings]	Port Hills	Arrow/ Southern Response	Full insulation Vapour barrier Hot water pipe wrap Glazing upgrade	Homeowner selected builder
11	Huntsbury 1	First home signed into pilot. On hold – owner/insurer dispute. May be excluded from project if not resolved soon.	Family: couple and two children	1950s Mass Housing+ 1980s addition	Port Hills	Arrow/ Southern Response	Full insulation Vapour barrier Dual flush toilet	Homeowner funded improvements
12	Woolston 1	Changed from a repair to a new build. Rebuild still not completed but close.	Couple and disabled son, major health issues	1950s Mass Housing	On the flat	IAG/ Hawkins	REBUILD – removed from BBS pilot	

3 Learning from pilot: implications for wider uptake

This research into the case study homes provides key detail which impacts on the design of any future roll out or upscaling of the Build Back Smarter approach, specifically:

- The independent home assessment and upgrade recommendations (generated using Beacon’s research-based methodology), including a written report, are important for the homeowner.
- Insulation upgrades – and in particular wall insulation, combined with better heating/heat transfer deliver immediate and valued results for homeowners (this supports findings from previous Beacon research).
- Opportunities for wall insulation retrofit can be greater than initially scoped as the builder is likely to employ the quickest and most practical methods – which often will involve relining rather than repairing plasterboard.
- Homeowners need to be informed *at the time at which they can influence the PMO Scope of Repairs* of the opportunities to improve the performance of their homes – *a general information campaign is unlikely to be effective.*
- Alongside the independent assessment and written report many homeowners will need an active advocate, or case manager to help them through the upgrade process.
- A funding package – particularly for lower income homeowners is an important part of any consideration of scaling up of the Build Back Smarter concept.
- Recruitment into the pilot has been very difficult – largely because buy in from PMOs participating in the project is limited to a handful of key staff. A mechanism to ensure that *all* PMOs actively support and promote the idea of a Build Back Smarter roll out is critical.
- There are a number of key measures which **MUST** be included at time or repair – otherwise they are much less likely to occur. Specifically these are:
 - wall insulation retrofit where recladding or wall linings are being replaced;
 - ceiling insulation retrofit to skillion and low pitched roofs where roofing or ceiling linings are being repaired;
 - cutting hatches to access “hard to insulate” places – these are common in roof extensions and “popped tops”;
 - underfloor insulation and ground vapour barrier installation under normally inaccessible suspended floors where foundation repairs are occurring – often these involve lifting the house creating a unique access opportunity to the underfloor;
 - installing heat transfer systems where ceilings are being repaired;
 - increasing specification of windows being repaired/replaced (double glazing, advanced glazing such as low emissivity/argon filled, thermally broken aluminium frames);
 - relocating or replacing poorly located/sized/ performing heating systems such as heat pumps and wood burners – it is worth noting that poorly located and sized heat pumps has been a common feature of Build Back Smarter houses;
 - replacing downlights with surface mounted fittings; and,
 - installing externally vented extract ventilation systems in kitchens and bathrooms

- Massive price escalations, and very high builder's margins being charged for subcontracted services, mean that other energy efficiency and wider sustainability measures not essentially included at the time of repair would best be left until *after* the earthquake recovery period is over.
- There is little appetite for water efficiency in the Christchurch market, even when these measures are offered for free. This is despite the substantial problems of water supply and wastewater disposal which have occurred (and for some houses are ongoing) as part of the earthquakes. The reasons for this can only be speculated upon, but are consistent with the perspective provided by the Christchurch City Council water engineers – that there is no need for water efficiency as the Christchurch aquifer will continue to provide cheap water for residents – despite the high energy and environmental costs of pumping this water, and the treatment and disposal of wastewater.

4 Next steps

4.1 Pilot project upgrades

All houses have now been assessed and refinements to the Beacon Home Assessment and Prioritised Plan tool (removing the “research” component and porting the report builder onto a different platform so that the assessment and output plan can be generated at the same time) are expected to be complete by September 2013 ready for wider use. An outline of the tool and its status is included in Appendix Two: Beacon Home Assessment and Prioritised Plan (HAPP) Tool.

Further house and case studies will be completed as upgrades are finished. Because of foundation issues, the time for repair for each house appears to be in the order of 4-6 months, so all pilot houses are not expected to be completed until the end of 2013. The findings of this work will be fed to key stakeholders via Beacon's attendance at the Canterbury Sustainable Homes Working Party.

4.2 Scaling up Build Back Smarter

Following the completion of the first case study, a workshop with key stakeholders (refer Appendix One for list of attendees). There was strong support across all the stakeholder interests (including insurer and PMO attendees) for the Build Back Smarter approach and its wider rollout.

Subsequently the Canterbury Sustainable Homes Working Party (CSHWP) has agreed to act as a vehicle to drive forward the uptake of the Build Back Smarter approach. A draft project plan and budget⁴ has been prepared. Key to the success of this initiative moving forward is ensuring that the learnings to date, and ongoing from the pilot are incorporated into this project plan and

⁴ *Seymour (2013)*

uptake strategy. To support the CSHWP project plan, Beacon has prepared a Value Case for the Build Back Smarter approach.

5 References

Easton, L. (2013a). Halswell 1: A Build Back Smarter case study. Report BBS/9 for Beacon Pathway Incorporated.

Easton, L. (2013b). Huntsbury 2: A Build Back Smarter case study. Report BBS/6 for Beacon Pathway Incorporated.

Easton, L. and Cowan, V. (January 2013). Interim report on Build Back Smarter project. Report BBS/5 for Beacon Pathway Incorporated.

Seymour, G. (June 2013) Implementation of Build Back Smarter Service for Canterbury. Report for the Canterbury Sustainable Homes Working Party.

Appendix One: List of participants at Beacon's Build Back Smarter stakeholder workshop April 2013

Full Name	Job Title	Company
Darryn Brewster	Eco-Build Advisor, Technical Team	Arrow International
Robyn Chidgey		Arrow International
Ann Currie		Canterbury District Health Board
Leanne Curtis	Relationship Manager	CanCERN
Nicole Randall	CERA Relationship Manager	CERA
Sam Fisher		Christchurch Agency for Energy
Tony Moore	Principal Advisor - Sustainability	Christchurch City Council
Adam Reid	Home Energy Advisor	Community Energy Action
Duncan Joiner	Chief Architect	Department of Building and Housing
Malcolm MacMillan	Operations Manager Earthquake Response	Department of Building and Housing
Paul Hobbs	In place of Peter Sparrow	Department of Building and Housing
Peter van Meer		EECA
Darrell Gane		Fletcher Aluminium
Annette Purvis	General Manager Personal Lines	IAG New Zealand
Graeme Baker		Insulpro
Andrew Olsen	General Manager	Lifemark
Steve Corbett	Communications Manager	MBIE
Simon Markham	Recovery Manager Manager Policy & Customer Service	Waimakariri District Council
Bruce Levey		Winstone Wallboards
Richard Scales		Winstone Wallboards
Rosemary Jackson		Rose Communications
Lance Spalding		Pinkfit
Daran Buckland		HNZC
Malcolm Jones		HNZC
David James		HNZC
Doug Allen		HNZC
Andrew Lusty		HNZC
Barry Bronsea		HNZC

Appendix Two: Beacon Home Assessment and Prioritised Plan (HAPP⁵) Tool

What does the Beacon HAPP do?

The Beacon HAPP Tool is designed to:

- Assess a New Zealand home in relation to energy efficiency (thermal envelope, hot water, heating and lighting), water efficiency, indoor environment quality (incl. dampness) and domestic waste.
- Produce a prioritised tailored upgrade plan for the house to support resident decision-making. The plan is backed up with a series of fact sheets that provide residents with independent robust information to support them making informed choices to improve the performance of their home.

Where did it come from?

The Beacon HAPP Tool was first developed and tested through a robust and peer reviewed research process during the 2007 – 2008 period. Staff in community organisations across New Zealand were trained to use the tool and applied it to 600 homes in all three climate zones.

Extensive research into the ease of use, consistency of output advice, effectiveness of the prioritised plan, and resultant actions taken by homeowners, was undertaken at this time, in order to optimize the tool. The logic underpinning the plan builder is based on building science, industry retrofit practice, relative costs and ease of individual interventions and the financial assistance available.

The HAPP Tool was subsequently used by the former Waitakere City Council and then the Auckland Council for approximately 400 homes in the Retrofit Your Home Programme. Council Building Consent Officers and Eco Design Advisors were trained in the use of the tool and undertook the assessments and plan development.

The HAPP Tool has been trialled for suitability for use in Earthquake damaged homes as part of the Build Back Smarter project in Canterbury. This current research has found the tool suitable for use as part of the wider roll out of the Build Back Smarter concept.

How does the Beacon's HAPP work in practice?

The HAPP Tool is supported by a one day Training Programme and Assessor Manual to ensure quality of implementation. Trained assessors can complete a home in ~45 minutes.

Currently the assessment is paper based and requires the assessor to enter data into an Excel spreadsheet (developed by BRANZ for Beacon) which generates a printed plan for each home. Beacon is in the process of porting this to a more user friendly platform enabling the prioritized plan to be generated at the time of assessment. It is expected that this work will be complete, and the tool will be market ready by September 2013.

⁵ *Name under revision*