The Build Back Smarter case studies

Beacon

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Building back smarter

The extensive repair and rebuilding required in Christchurch presented an opportunity to include upgrades which will improve a home's performance - we call this building back smarter.

The kind of damage sustained in the earthquakes - broken chimneys, damaged roofs, ceilings or walls, broken or poorly fitting windows and frames, cracked or damaged floors or foundations - provided the ideal opportunity to consider improving the performance of homes.

Generally these types of improvement only happen during major renovations, about once every 30 years. They are disruptive and costly. Undertaking these changes while builders, plumbers, electricians and other tradespeople are already working in a home made sense.

Size of the opportunity

The September 2009, February and June 2010 earthquakes and aftershocks damaged approximately half of Christchurch's housing stock

In April 2012

- 15-17,000 houses were to be demolished - approximately 5600 in the red zone
- 110,000 houses were to be repaired
- 100,000 homes needed repairs under $100k, 390,000 claims to EQC
- 15,000 homes needed major repair i.e. in excess of $100,000 worth of damage.

That's a substantial number of homes - a much larger opportunity than the 3,300 renovations that happen every year in Christchurch

The Build Back Smarter project

The Build Back Smarter project aimed to show that home performance improvements can and should be included in the 'standard' repair of earthquake damaged Christchurch homes.

The Build Back Smarter project was a way to work out how to include home performance improvements into the 'standard' repair of earthquake damage without slowing down the rebuild process or adding costs.

The project aimed to identify and address the barriers to upgrading homes during earthquake repairs. It successfully led to the launch of the Build Back Smarter Service for Christchurch residents

How the project worked

The Build Back Smarter project undertook six case study upgrades to demonstrate that home performance improvements can and should be included in earthquake repairs.

Beacon's Home Assessment and Prioritised Plan tool was used to assess each home and develop an individualised upgrade plan to fit with scoped earthquake repairs. A Beacon project manager provided case management and coordinated the upgrade work with the homeowners and PMO contractors on site.

The upgrades focused on:

- ceiling, floor and wall insulation
- double glazing
- solar or heat pump hot water
- rainwater tanks and efficient fittings
- clean efficient heating.

Interviews with the homeowners captured the difference they experienced in their upgraded home, and the homes were assessed using Homestar before and after upgrade.

Project backers

Build Back Smarter was a collaborative project. Insurers funded the earthquake repairs as per their policies but the additional upgrades were funded in part by Warm Up New Zealand (the current Government scheme to encourage insulation and heating) and in part by the project.

The project was funded by:

The case studies

Although the project aimed to upgrade ten homes, the slowness of the repair process in Christchurch meant that only six homes were upgraded as part of the Build Back Smarter pilot.

Case study	Household	House typology	Upgrades
Huntsbury 2	Retired couple	1950s mass housing + 1980s addition	• Full insulation • Ground vapour barrier • Two windows double glazed • Rangehood • Hatches • Heat transfer system
Spreydon	Couple	1930s bungalow	• Full insulation • Ventilation • Ground vapour barrier • Water efficient tapware • Rainwater tank • Efficient lighting
Somerfield	Family with 2 children	Transitional bungalow	• Insulation • Wood burner • Wetback/hwc • Heat transfer system • Rainwater tank • Efficient lighting • Two windows double glazed

Case study	Household	House typology	Upgrades
Halswell	Solo parent and 3 children	Late 1960s mass housing type	• Under-floor & wall insulation • Ground vapour barrier • Solar water heating • Upgrade to window replacement
Mt Pleasant	Couple	Villa + 2000s extension	• Full insulation • Ground vapour barrier • Rainwater tank • Ventilation • Efficient shower head • Downlight replacement
Papanui	Extended family of 6	1950s mass housing	• Wall insulation • Ventilation • IC rated LED downlights • Heating to sleepout • Heat transfer system

Huntsbury 2

Earthquake damage to Huntsbury 2

Huntsbury 2 is a large 1960s concrete block and stucco house with a first floor extension built in the 1970s and a basement garage.

Under the insurance scope of works, internal ceiling linings were to be extensively replaced, allowing current ceiling insulation to be topped up. There was easy access for under-floor insulation and, with soil levels higher on the outside than inside, a ground vapour barrier was a priority.

All of the stucco veneer and some wall linings were due to be replaced downstairs, providing a wall insulation opportunity. Stucco cladding on the upstairs extension was only going to be patched under the original scope of works so there was originally no opportunity to retrofit wall insulation. However, once the veneer started coming off, the builder discovered there was no building paper. Cracking on interior linings on both ground and upstairs external walls meant that the builder opted to remove most interior linings. This change in plan allowed all external walls, upstairs and downstairs, except for the kitchen, laundry, toilet and bathroom, to be insulated, more than originally planned.

The upgrades

Based on the house assessment and discussions with the homeowners, the Huntsbury 2 upgrades included:

- Topping up ceiling insulation to R4.6 and cutting hatches to access and insulate previously inaccessible roof cavity
- Installing underfloor insulation to R1.6
- Installing underfloor ground vapour barrier
- Installing R2.8 wall insulation on ground floor (except bathroom) - where both external wall cladding and internal linings were replaced and building wrap added as part of the repair
- Installing building paper and wall insulation to upper floor where internal linings were replaced
- Double glazing the south-facing windows in the upstairs bedrooms
- Draught stopping doors
- Lagging hot water pipes
- Installing a rangehood vented from an internal wall to outside
- Installing a heat transfer kit and thermostat from the main living area to the upstairs bedrooms.

What the homeowners thought

Huntsbury homeowners David and Helen quickly noticed the benefits of having their house upgraded during their earthquake repairs. They had their walls, ceilings and floors insulated along with a heat transfer system and double glazing as part of the Build Back Smarter project.

Helen and David's four-bedroom hillside home was damaged during the February earthquakes with the movement of the outside concrete walls and cosmetic damage inside.

Their Hawkins project manager suggested that they contact Beacon about becoming part of the Build Back Smarter project. Their Huntsbury home was the first house to be completed.

"We have really noticed a difference in the warmth of our home and it's also a lot cooler on those really hot days we've been having," said Helen.

The couple used to heat their dining room/main living area with a woodburner and spend as much time as possible in this area. The rest of the house, particularly upstairs, would remain cold, even on sunny days.

"I used to put on a down jacket to go into the lounge to play my piano. Our home is now so much more comfortable and we've even noticed health benefits such as fewer sinus issues. We are very appreciative of the work that has been done and how it will impact on our lives."

David and Helen's home was upgraded at the same time as earthquake repairs were carried out, with Beacon Pathway's Bill King as project manager. Although they had to move out, David and Helen were pleased with how easy the process was and appreciative that they are one of the earlier homes to be repaired.

"We are very grateful that the work was completed so early and we hope the other people in the trial enjoy their warmer more comfortable homes."

Homestar ratings improved

Pre-upgrade ... to ... post-upgrade

Homestar™ report

Homecoach assessed

Your Homestar rating

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Analysis

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Compare your rating

Homestar™ report

Homecoach assessed

Your Homestar rating

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Compare your rating

The average score for
your type of house

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Halswell 1

Earthquake damage to Halswell 1

The house and grounds suffered from substantial liquefaction in several of the earthquakes, as well as the ground level dropping. There was also damage to exterior brick cladding, ceiling damage in one room, as well as minor damage to wall linings, and some other fixtures.

In terms of the scope of the earthquake repairs:

- All of the brick cladding on the ground floor was replaced and building wrap installed
- Ceiling linings were replaced in 3 bedrooms, hallway and lounge
- Wall linings were repaired and redecorated
- Doors were eased and adjusted throughout
- Contaminated liquefaction was removed from the sub-floor
- The floor was levelled through pile re-packing
- Ring foundation cracks were repaired and foundation re-plastered
- Driveway, paths and patio paving were replaced
- Additional stormwater drainage was installed.

The upgrades

Based on the house assessment and discussions with the homeowners, the Halswell 1 upgrades included:

- R 2.8 wall insulation installed in whole house from the outside while cladding was replaced and building wrap installed.
- R1.6 underfloor insulation installed
- Polythene ground vapour barrier installed
- Draught excluders installed on door
- Homeowner funded standard double glazed windows in aluminium frames with glare tint for large north and west facing windows in lounge. BBS project funded additional cost for thermally broken frames with low emissivity, argon-filled glass
- Solar thermal system installed on existing hot water cylinder
- Pipe lagging installed on hot water pipes
- Homeowner may relocate badly located hallway heat pump herself in the future.
- Rangehood ducted to the outside.
- New bathroom extract ventilation installed and externally ducted
- New dual flush toilet cistern

What the homeowner thought

Halswell homeowner Sandra now enjoys arriving home after a day's study after her Halswell house was transformed from an ice box into a warm cosy home.

"I've noticed that we haven't been as sick in winter and it's so much nicer coming home to a warm house, whatever the weather," says Sandra.

Sandra's home, a 1960's brick clad three-bedroom house, was damaged during the February 2010 earthquakes with the brick veneer and foundations moving, extensive liquefaction, damage to outside paved areas and cosmetic damage inside. Because of the liquefaction, mould and damp had spread through the house, and particularly into her daughters' south western bedroom.

As part of Build Back Smarter, the family had their walls and floors insulated, and bathroom and kitchen extract fans and a solar hot water system installed while their home was repaired.

With three daughters, hot water is always in demand so the solar water heating, combined with only using one heat pump, reduced polytechnic student Sandra's power bills from up to $600 a month down to $200.

"Since moving back, the lounge heat pump warms the whole house. We haven't needed to run the dehumidifiers or electric blankets, and I can't feel the moisture on the walls in the girls' bedroom now," said Sandra.

Sandra paid to have her road-side windows replaced with double glazing as the full height windows were letting cold air into the home. As part of Build Back Smarter, these were upgraded to low emissivity, argon filled glass and thermally broken aluminium frames, providing a better result.

"Our windows were draughty, many didn't open and the window sills were rotten. And during summer our lounge was incredibly hot due to the glare from the windows. We managed to borrow the extra money from the bank for the double glazing and I am so glad I did."

Homestar ratings improved

Pre-upgrade ... to ... post-upgrade

Homestar™ report

Homecoach assessed

Your Homestar rating

Analysis

Congratulations, on completing the Homestar " rating.

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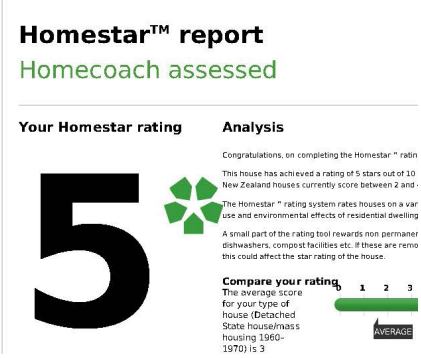

Homestar™ report

Homecoach assessed

Your Homestar rating

Analysis

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this could affect the star rating of the house.

Compare your rating

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Spreydon 1

Earthquake damage to Spreydon 1

The house suffered from significant damage to foundations from the earthquakes. Ground movement caused uneven settlement of ring foundation and piles, and damage to sewer and stormwater drains. Foundation repairs required the house to be jacked up, providing the opportunity to add underfloor insulation and a ground vapour barrier.

Most interior lath and plaster ceiling and wall linings were badly cracked, opening the way for full wall insulation of the home. Repairs to the foundation required the removal of the internal brick chimney with the opportunity to install more efficient heating.

In terms of the scope of the earthquake repairs:

- The house was jacked up and the concrete ring foundation replaced, including piling down to 6 metres
- Lath and plaster ceiling and wall linings were replaced throughout
- Doors and windows were eased and adjusted throughout
- Sewer and stormwater drainage was checked and minor repairs were made
- Full interior and exterior redecoration.

The upgrades

Based on the house assessment and discussions with the homeowners, the Spreydon 1 upgrades included:

- R 2.8 wall insulation installed in whole house
- R1.6 underfloor insulation installed
- Polythene ground vapour barrier installed
- Homeowner funded extension including double glazed windows
- New hot water cylinder and wetback installed by homeowner
- Additional pipe lagging post completion
- Heat pump relocated to other end of hallway
- New low emission, freestanding woodburner installed by homeowner
- Heat transfer system installed taking heat to two bedrooms and hallway (changed from third bedroom by homeowner)
- New bathroom extract fan installed
- New externally vented rangehood
- Tap aerators specified as part of work but not installed by builder
- 1000 litre rainwater tank installed
- Dual flush toilet installed as part of wider bathroom upgrade by homeowner
- Installed multiple IC -rated downlights as part of extension and kitchen upgrade.

What the homeowners thought

When Chantal and Gregor walked back into their family home after their earthquake repairs they couldn't believe the transformation. Not only had they included extensions in their cramped home but they also took part in Beacon Pathway's Build Back Smarter trial to create a warmer, drier home.

Chantal describes the family home pre-earthquake as an ice box, only made worse by damage to the interior and liquefaction outside. "Our heat pumps and old wood burner weren't enough to heat our home. We used to be bundled up in so many clothes."

Built in the 1930's, their three-bedroom home had no insulation. Through Build Back Smarter, they received wall, ceiling and under floor insulation, a vapour barrier, a heat transfer system, an extractor fan in the bathroom, and a 1000 litre rainwater tank.

In addition to the Build Back Smarter upgrades, Chantal and Gregor also installed double glazed windows in the conservatory, bought a new hot water cylinder with wetback, a new low emission freestanding wood burner, removed the chimney, used thermal curtains, and installed both an externally vented range hood and a dual flush toilet.

With a drier home, the couple noticed that on colder days they now set their heat pump at a much lower temperature, the house heats more quickly and stays warm for longer, saving in electricity costs.

The new water tank is used to water the gardens using run-off from the roof and also is the added bonus of being a water supply "if we ever don't have water again".

It was their Hawkins project manager who suggested they take part in Build Back Smarter after the February earthquakes not only resulted in a significantly damaged house but also both Gregor and Chantal lost their jobs.

To make the Build Back Smarter upgrades as seamless as possible, Beacon Pathway's Bill King was project manager and helped the couple to make some minor changes to improve their home's heating. "Bill suggested moving the heat pump. He explains things very well and knew what he was talking about and related it to our situation," said Gregor.

Homestar ratings improved

Pre-upgrade ... to ... post-upgrade

Homestar™ report

Homecoach assessed

Your Homestar rating

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Analysis

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Analysis

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Somerfield 1

Earthquake damage to Somerfield 1

The house suffered from significant damage to foundations from the earthquakes. Ground movement caused uneven settlement of ring foundation and piles, damage to sewer and stormwater drains, the concrete terrace, external paths and the driveway. All interior lath and plaster ceiling and wall linings were badly cracked. Because of the foundation failure, repair also required the removal of the internal brick chimney.

In terms of the scope of the earthquake repairs:

- The house was jacked up and the concrete ring foundation replaced with timber piles and baseboards
- Lath and plaster ceiling linings were replaced throughout
- Lath and plaster wall linings replaced throughout
- Doors and windows were eased and adjusted throughout
- The concrete deck was replaced with a wooden deck
- Driveway, paths and patio paving were replaced
- Sewer and stormwater drainage was checked and minor repairs were made
- The house was re-wired at the insurer's cost.

The upgrades

Based on the house assessment and discussions with the homeowners, the Somerfield 1 upgrades included:

- R 3.2 blanket overlaid on top of existing insulation
- R 2.8 wall insulation installed in whole house
- R1.6 underfloor insulation installed
- Polythene ground vapour barrier installed
- Draught excluders installed
- New hot water cylinder installed by homeowner
- New low emission woodburner installed as part of earthquake repairs
- Heat transfer system installed taking heat from lounge to bedrooms
- New externally vented rangehood installed by homeowner
- New bathroom extract ventilation was specified to be installed in better location. Builder didn't replace unit because contractor felt it was adequate.

What the homeowner thought

Somerfield homeowners Rex and Susan have come home to a substantially warmer and drier home after their earthquake repairs included Build Back Smarter upgrades.

Prior to the earthquakes, the homeowners had taken what they thought were the best steps to reduce the dampness of the house and installed the positive pressure ventilation system, even though there was only a low level of insulation in their ceiling. The homeowner reported this had a slight improvement on the overall level of dampness in the house but that there was still mould growing in some rooms.

“The house was so damp that if I brought papers home from work, they would absorb so much moisture they wouldn’t go through the fax machine any more,” said Susan.

As part of Build Back Smarter, the family had ceiling, wall and floor insulation, a ground vapour barrier, new wood burner and heat transfer system, and an externally vented range hood installed while their home was repaired.

Rex and Susan immediately noticed the reduction in moisture in their home, a notable improvement in warmth, and the absence of condensation on the windows. In particular, the lack of draughts and improvement in temperature of the floor was noticed. The house was also noticeably easier to heat with the heat transfer system giving good results.

“It’s great no longer needing to wear socks to bed - or having to put slippers on to get up in the morning.”

Susan and Rex saw significant value in the Build Back Smarter approach, and found the house assessment useful, wishing that they had had this done prior to getting the positive pressure ventilation system installed.

The homeowners spent approximately $45,000 themselves on the upgrade of the kitchen, laundry, hot water system and wood burner.

Homestar ratings improved

Pre-upgrade ... to ... post-upgrade

Mt Pleasant 1

Earthquake damage to Mt Pleasant 1

The house suffered from significant damage to foundations from the earthquakes, made more complex by the two different foundation types. Ground movement caused uneven settlement of ring foundation and piles of the older part of the home, and voids formed beneath the 32m^2 concrete slab to part of the extension. Damage also included damage to the roof cladding, window joinery, exterior paintwork, entry floor tiles, tongue and groove flooring finish, retaining walls, fencing and driveway. Most interior lath and plaster ceiling and wall linings were badly cracked.

In terms of the scope of the earthquake repairs:

- Repair of the foundations by packing and replacing floor piles, grout pumping into the voids beneath the concrete slab, epoxy injections into the cracks in the ring foundation
- Replacement of the roof
- Most lath and plaster ceiling linings were replaced throughout
- Most lath and plaster wall linings replaced throughout
- Internal doors were eased and adjusted throughout.

The upgrades

Based on the house assessment and discussions with the homeowners, the Mt Pleasant 1 upgrades included:

- R3.2 ceiling insulation installed over existing insulation
- R1.8 ceiling insulation installed in skillion sloping ceiling
- R 2.8 wall insulation installed in older part of house with building wrap segments inserted between the frames
- R1.6 underfloor insulation installed under suspended floor where access available
- Replacement of external doors with double glazed u-PVC doors
- New double glazed, uPVC-framed windows
- Gas heater removed. Freestanding 15.7 kW woodburner installed
- Heat transfer system installed to take heat from living room to two bedrooms
- Halogen and incandescent downlights replaced with IC-rated LED downlights
- New bathroom extract installed with external ducting
- Bench-level extractor fan repaired
- New low flow tapware installed by homeowner
- Low flow showerheads installed.
- 1000 litre rainwater tank installed
- Timers installed on heated towel rails.

What the homeowners thought

Peter and Debbie bought their hillside bungalow between the September 2010 and February 2011 earthquakes and the house suffered significant damage to its foundations and interior.

They now have an efficient heat transfer system to take the heat from the living area to the southern side of the house; wall, ceiling and floor insulation including a vapour barrier; downlights replaced with LED lighting, extract fans were installed in the bathroom and ensuite, and timers added to the heated towel rails.

The difference to their home has been significant, says Peter. “We come home and the house is warm. Even the rooms at the back of the house are as toasty as the living room.”

To add to the warmth and energy efficiency of their home, Peter and Debbie paid for new double glazed uPVC-framed windows for the whole house, and a freestanding woodburner to replace the living flame gas heater that was seldom used due to its high running cost. Debbie had new curtains made and installed for the whole house, “but we never need to draw the curtains as the double glazing is so efficient.”

Even with the cooler months they find they don’t have to get the woodburner or heat pump up and running until 8pm, saving significantly on their power bills and the cost of fire wood.

Peter’s office is on the southern side of the house and, being an asthmatic, he found the cold space affected his health. With heat transferred from the living area, he says his office is now as “toasty” as the rest of the home.

The wood burner does more than take the chill off but also has the added bonus for the couple is that they can also cook on it. “So if we do lose power at any stage ,we still have heat and we can eat,“ said Debbie.

The wall, ceiling and floor insulation combined with the large double glazed windows at the front of the house has totally changed the feel of their home. “The house feels more peaceful and you can feel the warmth as soon as you walk in the door.”

Homestar ratings improved

Pre-upgrade ... to ... post-upgrade


Homestar™ report

Homecoach assessed

Your Homestar rating

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Analysis

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1. Homestar™ Report:

Your Homestar Rating

5

Analysis

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Papanui 1

Earthquake damage to Papanui 1

Papanui 1 is a single storey lath and plaster home with a sleep-out. The ceiling and floor were already well insulated between and over floor/ceiling joists. Windows were single glazed and wooden framed and both doors and windows were draughty. An aging bathroom extraction fan and the kitchen rangehood were both vented into the ceiling. The house was heated by a heat pump and older wood burner. The sleep-out was cold with a flat roof and no insulation in ceiling or walls. There are only windows in one side with a door to each of the bedrooms so it is not well ventilated. Much of the house was lit by downlights.

Six people from an extended family live in the house and sleepout. The family includes a baby (living in the sleepout) and a son with rheumatic fever.

In terms of the scope of the earthquake repairs:

- Foundation repairs
- Ceiling linings were replaced throughout
- Cladding and wall linings were replaced.

The upgrades

Based on the house assessment and discussions with the homeowners, the Papanui 1 upgrades included:

- Fitted ceiling insulation over IC-F rated downlights
- Upgraded to R2.8 wall insulation
- Repaired vapour barrier
- Installed draught-proof door between the laundry and garage
- Draught stopped exterior doors
- Installed heat transfer system to heat bedrooms
- Installed Energy Star-rated heat pump to heat sleep-out
- Replaced with LED/ IC-F rated downlights.
- Replaced all other bulbs with CFLs
- Replaced bathroom extract fan ducted externally, and separated from light
- Ducted existing rangehood externally
- Installed tap aerators to reduce flow.

Learnings from Build Back Smarter case studies

Case management important in Christchurch

Post-upgrade interviews with the homeowners showed that they valued the independent home assessment and upgrade recommendations. Alongside these, though, needs to sit an active advocate, or case manager, to help homeowners through the upgrade process. This has been particularly valuable in helping homeowners understand the opportunities and making the process smooth and timely.

Some measures should be prioritised above others

The project made it clear that there are some upgrades that need to be done at the time of repair or the opportunity will be lost for the foreseeable future. Opportunities for wall insulation retrofit, in particular, 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.

Priority measures during earthquake repairs are:

- Ceiling insulation retrofit to skillion and low pitched roofs where roofing or ceiling linings are being repaired.
- 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.
- Wall insulation retrofit where cladding or wall linings are being replaced.
- Increasing specification of windows being repaired/replaced (double glazing, advanced glazing such as low emissivity/argon filled, thermally broken aluminium frames).
- Cutting hatches to access hard-to-insulate places (roof extensions and “popped tops”).
- Installing externally vented extract ventilation systems in kitchens and bathrooms.
- Installing heat transfer systems where ceilings are being repaired.
- Replacing downlights with surface-mounted fittings.
- Relocating or replacing poorly located/sized/performing heating systems. (Poorly located and sized heat pumps have been a common feature of Build Back Smarter houses).

Leave other interventions for later

Massive price escalations, and very high builders' 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 earthquake recovery.

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 as part of the earthquakes.

An opportunity not to be missed

The earthquakes have created a once-in-a-generation opportunity to address some of the root causes of poor health and fuel poverty in Canterbury households.

The types of interventions recommended (insulation, heating and ventilation improvements) strongly align with residential damage being repaired post-earthquakes. As a result, the work to upgrade homes is best implemented at the time of repair.

This opportunity to intervene in a region's housing stock has substantial societal benefits: reduced health costs, reduced days off work and school, and improved community well-being. However, the capacity of Canterbury residents to be able to take up this once- in-a-generation opportunity is unlikely to be high for either owner occupiers or rental property owners. Therefore, there is a strong rationale for

The case for including wall insulation in post-disaster repair

Of all the potential improvements to Christchurch houses, we believe the greatest opportunity lies in installing wall insulation. Why? Because it will make the biggest improvement to how the home performs and because the chance to do so doesn't come around often.

It is an important piece in the house performance puzzle

Wall insulation is the lesser known cousin of ceiling and under-floor insulation. It's not government subsidised (yet) and many homeowners don't realise its importance. However, research has shown that insulating only the ceilings and under floors will save a bit through using less energy but it won't warm the house to a healthy level. To reach the minimum temperatures recommended by the World Health Organisation for good health (16°C in bedrooms and 18°C in living spaces) AND save energy, wall insulation is vital.

We've seen the benefits of including wall insulation in the NZ Housing Foundation's HomeSmart Home - warm enough not to need heaters, very low power bills for this low income family, and goodbye to the family's asthma problems. Even taking a purely economic approach, there is a 1.88 year payback period on insulating bedroom walls, and even utility rooms come out with a payback of less than 9 years.

The opportunity is huge and won't come around again for a while

There are two reasons that wall insulation is not often retrofitted to existing homes. It's costly - although the cost of the wall insulation and installation itself is relatively low, the cost of removing wall linings or cladding is significant. And it's inconvenient - generally, rooms need to be vacated while linings are removed, replaced, gib-stopped and finished.

For these reasons, wall insulation is often only undertaken during major renovations, a once-in-30-year event. There are an estimated 3,300 renovations normally undertaken annually in Christchurch where re-lining of plasterboard in walls occurred.

Compare this to the number of homes awaiting repair: 110,000. Many of these homes have damaged cladding or internal linings, which will be replaced as part of the earthquake repairs. A golden opportunity indeed! And given 63% of Christchurch's homes were built before insulation was mandatory, most of these will have no wall insulation whatsoever.

Build Back Smarter Service

Build Back Smarter was not just a set of case studies. It led to action!

Build Back Smarter provided evidence that performance upgrades **CAN** be undertaken at the same time as earthquake repair without impacting the repair process

As a result, Christchurch City Council launched a free Build Back Smarter service for Christchurch people rebuilding or repairing their earthquake-damaged homes.

The Service included:

- Home assessments by approved assessors
- A healthy home improvement plan tailored to the needs and budget of the home-owner
- Advice about insulation, heating methods and energy saving measures such as double glazing, ventilation and lighting.

The project management element of the case studies was not carried over into the Build Back Smarter Service.

The Build Back Smarter Service was highly valued

Feedback showed that the Service had an 87% customer satisfaction rate, making it one of the most highly regarded services offered by the Council. 91% of customers were satisfied with the verbal advice, 87% with the written advice, and 85% valued the advisor's understanding of the home and the owner's needs.

Uptake of change was high

64% of customers had made changes to their home in the six months after they received the healthy home improvement plan. This is a high level of reported action/ uptake.

Type of home improvement	Percent of those who made changes
Efficient lighting (switching to LED bulbs)	58%
Insulation (ceiling, underfloor or walls)	48%
Improvements to curtains or rails	41%
Opening windows and doors more frequently	41%
Draught stopping around windows and doors	35%
Ventilation of kitchen or bathroom	34%

Find out more about Beacon

Our website includes all the research undertaken in Beacon's original government research contract, and information on current research and projects.
www.beaconpathway.co.nz

Check out our Facebook page:
www.facebook.com/beaconpathway

Check out the Beacon Blog
www.beaconpathway.blogspot.co.nz

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About this Report

Reference
Beacon Pathway (2021). The Build Back Smarter case studies.