

Your chance...

TO BUILD BACK SMARTER

Many houses in Canterbury have been damaged by earthquakes. Recovering from this damage presents a unique opportunity to make houses better for you, better for the environment and cheaper to run.

Repairing earthquake damage is the ideal time to consider improving your home and the benefits it can bring:

- » A warmer, drier, more comfortable home
- » Reduced energy bills and less water use
- » Improved health with fewer visits to the doctor
- » A more resilient and valuable home

The purpose of this guide is to help you when talking with builders and in making decisions about repairing your home. It provides tips for repairing your home and gives indicative costs and savings that could be made for an average sized, three to four bedroom home.

In most cases you, as the homeowner, will have to fund the additional cost of the improvements set out in this guide. The good news is that government grants are available for insulation, clean heating, solar and heat pump hot water, and chimney replacement. Plus, best of all, you can enjoy the benefits of these improvements.

Common problems addressed in this guide

- » cracked or damaged internal and external walls p.2
- » holes or cracks in the roof and ceiling p.3
- » fallen or damaged chimneys p.6
- » leaking or dislodged water cylinders and pipes p.7
- » cracked or uneven foundations and floor slabs p.4
- » broken or poorly fitting windows and doors p.5
- » damaged joinery, furnishings and carpets p.8
- » damaged and inefficient light fittings p.9

Before you do anything...

Make sure that you have made a claim with the Earthquake Commission and that your house has been assessed (www.eqc.govt.nz, 0800 326 243). Once you have a better idea of the type of repairs needed, do some further research and make a checklist of the improvements specific to your home so that you can discuss them with the relevant insurer, builder, and tradespeople.

Where to start

The list below gives an indication of where to start and what order to undertake home improvements, based on the benefits to your health, cost savings and environmental benefits. Although each home and budget will vary, consider working through the following order of priority.

- 1. Building resilience and structural integrity**
Priority: stronger foundations, increased bracings, using lighter building materials such as timber cladding and metal roofs.
- 2. Thermal envelope**
First, insulate the ceiling and under the floor, stop draughts around windows and doors and install thermal curtains; then insulate south walls, double glaze south windows, and finally, the rest of the walls and windows.
- 3. Dampness control**
First, check and maintain rainwater drainage and wastewater pipes; then install a ground vapour barrier, bathroom ventilation, and kitchen ventilation; and finally install a vapour barrier in the walls along with wall insulation.
- 4. Efficient sustainable heat source**
Make the most of warmth from the sun; then choose efficient heating systems for living spaces (heat to a minimum of 18°C when occupied); then bedrooms (heat to a minimum of 16°C when occupied).
- 5. Water efficiency**
Choose the easy and simple measures first, such as water saving devices placed in existing toilet cisterns, low flow showerheads, and the purchase of water efficient appliances; then install aerated taps and dual flush toilets.
- 6. Efficient sustainable water heating**
First, insulate pipes with lagging and wrap hot water cylinders; then consider solar or heat pump hot water systems.
- 7. Supplementary water supply**
Rainwater tanks for watering gardens or flushing toilets; then, consider greywater systems in areas with well-draining soils.

About Homestar™



Homestar™ measures or rates the performance of your home, in a similar way to the energy star rating for a washing machine or fridge. The advice given here closely aligns with the Homestar™ rating tool – so making the effort to build back smarter can increase the performance, value and comfort of your home. A trained Homestar Practitioner can provide you with professional advice about incorporating good environmental design and help you get the appropriate Homestar rating. Use the free online version of the rating tool to compare different options for your home www.homestar.org.nz.

WALLS



Challenge:

Internal or external wall damage

Opportunity:

If you have to replace the wall linings or external wall cladding this is the best time to add or upgrade the insulation in the walls.

Solution:

In timber and steel frame walls, remove damaged linings or external wall cladding as well as any damaged framing. Increase the bracing where required. Add insulation and building wrap (building paper). Replace with new linings or cladding. Add insulation that is at least R2.6, the higher the better. Note that higher levels of wall insulation beyond R2.8 may only be possible if you increase the width of the walls or rebuild completely.

Cost estimate:

The best time to upgrade your wall insulation is while you are replacing wall linings or external wall cladding. The insulation itself isn't that expensive but fitting it will take the tradespeople extra time. Allow between \$2,200 and \$2,800 for the costs of the insulation for an average sized house, and \$1,200 extra for fitting.

Further info:

Websites:

Smarter Homes www.smarterhomes.org.nz/design/insulation

Download free Your Guide to Smarter Insulation: www.smarterhomes.org.nz/fileadmin/docs/Insulation_Guide.pdf

EECA's Energywise website www.energywise.govt.nz/how-to-be-energy-efficient/your-house/insulation/wall-insulation

Download free New Zealand Standard NZS 4246:2006: Energy Efficiency – Installing Insulation in Residential Buildings www.energywise.govt.nz/node/3009

Department of Building and Housing guidance on rebuilding and repairing homes in Canterbury: <http://www.dbh.govt.nz/canterbury-earthquake>

Benefits:

Wall insulation will stop heat being lost, keeping your home warmer in winter and providing as much as \$400 worth of savings per year compared to a non-insulated house.

Household running cost savings				
Improved comfort and better health				
Increased capital value of the home				
Improved Homestar™ rating				

Talk to your builder about...

- » The best insulation options for your home – and whether it is worth doing the whole home at the same time.
- » Taking advantage of opening your walls for insulation to also check your wiring and plumbing. In older houses, it may be cost effective to re-wire at the same time.
- » Prioritising living areas, bedrooms and the south facing colder sides of the house first as these will be the ones losing the most heat.
- » Ensuring that insulation is installed in accordance with the appropriate NZ standards (especially NZS 4246:2006 – see www.energywise.govt.nz/node/3009).

Next steps:

1. Find out about grants or loans assistance for insulation from EECA.
2. Work out a budget, including what your insurance will cover and any financial support for additional costs.

CEILING AND ROOFS



Challenge:

Damaged ceiling or roof – external or internal

Opportunity:

Upgrade ceiling/roof insulation and remove recessed downlights (see lighting section). Change roofing to lighter materials. Upgrade or install bathroom and kitchen ventilation.

Solution:

Standard ceilings / roofs (houses with an accessible ceiling space): Remove damaged linings and any damaged ceiling joists and replace; re-wire any lighting where recessed downlights have been removed and replace with surface mounted lights or lights fitted onto the end of a cord (known as pendant fittings). It may be that fewer lights will be required.

Ensure existing extractor fans in bathrooms and kitchens are vented to the outside of the house (through the roof or under the eaves), or fit extractor fans if you don't already have them.

Fit thick bulk ceiling insulation between and over the ceiling joists (ideally as a blanket). Aim for R4.0 insulation or more if you want to be warmer (this may be installed as a couple of layers). Where roofing material is damaged, replace with suitable new material – consider more earthquake-proof options such as long run steel, rather than heavy tiles, for your roof covering. This can reduce the weight of a roof by up to 12 tonnes for an average family home which can make a big difference in an earthquake.

Skillion roofs (houses without ceiling space): There are a number of options for improvement depending on the roof type and area of damage. If only the internal linings are damaged, these can be removed and, if there is enough room between the linings and the roof, additional insulation can be added prior to new linings being put on. Your builder may need to make additional room in the roof cavity by packing or spacing it out with battens to get extra insulation in. If the

Further info:

Websites:

EECA grants information www.energywise.govt.nz/funding-available/insulation-and-clean-heating

EECA's Energywise website

www.energywise.govt.nz/how-to-be-energy-efficient/your-house/insulation/ceiling-insulation

roofing material is damaged, it may be cost effective to have it removed, upgrade the insulation levels, and have the roof put back on at the same time. Again, aim for as high an R value as possible – ideally at least R4.0.

Cost estimate:

Because most of the heat in the home is lost through the roof, adding insulation is extremely effective and this is a priority area for retrofit. It can also keep the house cooler in summer. The costs of adding ceiling insulation to a standard roof without any previous insulation is between \$2,000 and \$2,500 – but grants are available from EECA for all houses built prior to 2000 and these can cover a third or more of these costs.

Benefits:

Ceiling insulation will stop heat loss through your roof, keeping your home warmer in winter and cooler in summer. This can provide as much as \$500 worth of savings per year compared to a non-insulated house.

Household running cost savings					
Improved comfort and better health					
Increased capital value of the home					
Improved Homestar™ rating					

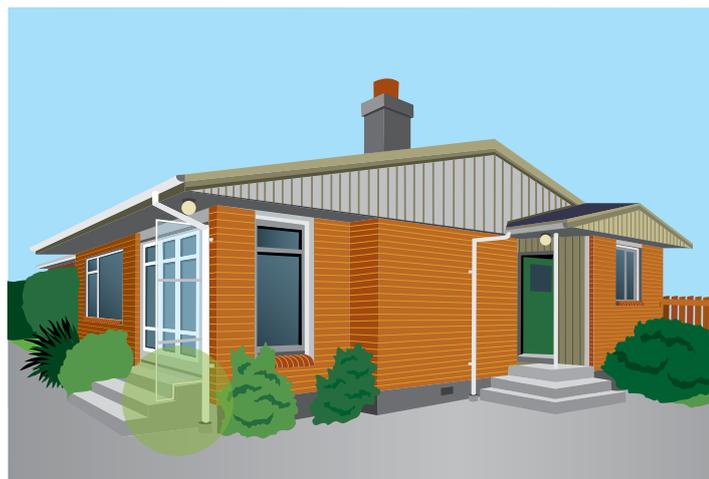
Talk to your builder / roofer / electrician about:

- » The damage to your roof and the best options available to get more insulation installed – aim for R4.0, which could be 175 mm or thicker, depending on the type of insulation.
- » Fixing other issues at the same time- such as putting in ventilation to bathrooms and kitchens - and the order in which these should be done to minimise damage to the new insulation.
- » Replacing downlights – this is the ideal time to rid your house of downlights, which create holes in your insulation and suck warm air out of your house.
- » Roof colour - lighter roofs reflect heat and darker roofs attract heat. Because the sun can be quite strong in summer, a lighter roof will help to keep the house cooler.
- » Roofing materials – replacing heavy concrete or clay tiles with lightweight metal to reduce loads.

Next steps:

1. Find out about grants or loans assistance for insulation from EECA (see link below).
2. Investigate opportunities to install extractor fans with external venting, and remove downlights.
3. Work out a budget for the work including the additional costs of better insulation, ventilation, lighting and more suitable roofing material options.
4. Discuss the project with your builder.

FLOORS & FOUNDATIONS



Challenge:

Damaged floors and foundations, cracked concrete slabs and un-level floors

Opportunity:

During repairs, strengthen the foundations; replace or upgrade the insulation under the floor; add a ground moisture barrier; and potentially raise the floor level for increased flood protection.

Solution:

This will vary depending on the type of floor and the extent of the damage. Some floors will need to be re-levelled, some will require rebuilt foundations, and others may necessitate a full house rebuild. Foundations are critical to a safe house and several technical specialists may be required (such as geotech specialists, engineers and builders). An example of an engineered solution is strengthening the foundations with tied steel and using compacted hardfill instead of tailings underneath any new concrete floor slab. Whatever the path taken to rebuild your home, the opportunity to add insulation under the floor should not be missed.

Concrete floors: Adding insulation under a concrete slab can only be achieved when a new slab is poured. If this is required, talk to the builder about having a minimum of 50 mm 'S grade' expanded polystyrene (EPS) board over the damp proof membrane prior to the poured concrete slab. In addition, the perimeter of the slab should also be insulated as this is most effective at keeping the heat in. If a whole new slab is not required but works are being carried out to level and repair the slab, investigate options to add insulation to the perimeter – it will make the house much warmer. This is because most of the heat is lost through the edges of the concrete, rather than through the middle of the slab down into the ground.

Further info:

Websites:

EECA grants information www.energywise.govt.nz/funding-available/insulation-and-clean-heating

Smarter Homes www.smarterhomes.org.nz/design/insulation

Department of Building and Housing guidance on rebuilding and repairing homes in Canterbury:
<http://www.dbh.govt.nz/canterbury-earthquake>

Timber floors:

If suspended timber floors are being repaired or replaced, ensure that they are insulated with a bulk insulation product to achieve a minimum R-value of at least R1.4 under the floor. Provided there is adequate access space under the floor (more than 40cm), take the opportunity to install an on-ground moisture barrier (usually black polythene), which will help to keep your home warm and dry. Fix any drainage issues or leaks under the house at the same time. Some people have found new springs or moisture coming up beneath homes because of ground movement. To improve performance of wooden floors in areas of ground instability, ensure the piles are based below the liquefaction layer.

Cost estimate:

Repairing your floor and foundations provides a golden opportunity to upgrade the insulation. Adding underfloor insulation to a suspended timber floor of an average 150m² house would cost about \$1,500 - \$2,000; and grants are available from EECA to help pay for underfloor insulation in houses built prior to 2000.

Benefits:

Upgrading floor insulation can keep you warmer and drier and save an average home up to \$250 per year in heating costs

Household running cost savings	■	■	■	■	■
Improved comfort and better health	■	■	■	■	■
Increased capital value of the home	■	■	■	■	■
Improved Homestar™ rating	■	■	■	■	■

Talk to your builder/engineer about:

- » The scope of the damage to the foundation and the potential to add underfloor or perimeter insulation as part of the rebuild process.
- » The potential to raise the floor level as part of the rebuild in order to protect the property from newly identified flooding risk in Christchurch.

Next steps:

1. Ensure that all the technical reports and specialist engineering advice relating to the property are available to the builder.
2. Investigate the potential for financial assistance from EECA for adding insulation under suspended timber floors.
3. Work out a budget for the work including the additional costs of adding the underfloor insulation and moisture barrier.
4. Discuss the project with your builder.

WINDOWS



Challenge:

Broken or poorly fitting windows and joinery

Opportunity:

Replace damaged windows with more efficient double-glazing or 'low-e glass' options; consider reducing window size on the southern and western sides of the house. These steps will reduce the heat loss in winter and help to stop overheating in summer.

Solution:

Where windows are damaged, there are two main options – replace the whole window frame with new frames and double-glazing; or, where frames are undamaged and only the glass is broken, install double glazed inserts or high performance 'low-e glass' into your existing window frames. The 'e' stands for 'emissivity', which means that it lets light in but stops heat escaping as quickly as normal glass. If replacing entire window frames, aim for thermally broken aluminium or wooden/PVC windows as these perform the best at keeping the heat in and stopping condensation forming on the windows (make sure any PVC meets NZ Standards for UV).

If you have to replace entire window frames (or fix walls), this is a good time to reassess the necessity for windows on colder, less sunny sides of the house (typically southern and south-eastern). Walls lose much less heat than windows, so consider the option to resize the glazed area, replacing it with a smaller window and a well-insulated wall.

Overheating is a big issue for houses in Christchurch, particularly in hillside suburbs facing the Southern Alps for the views. Reducing the size of windows or adding tints or external shading can minimise the risk of overheating.

Further info:

Websites:

Smarter Homes www.smarterhomes.org.nz/design/glazing/double-glazing-glass-options

www.smarterhomes.org.nz/design/glazing/frame-options

EECA's Energywise website www.energywise.govt.nz/how-to-be-energy-efficient/your-house/insulation/window-insulation

The Window Association of New Zealand provides advice and information about choosing windows www.wanz.co.nz/

Cost estimate:

If the window glass or frames need to be replaced due to damage, this is the best and most cost effective time to upgrade to a more efficient window type. Costs vary widely due to the difference in size and type but, as a guide, double glazing is about \$80 - \$110 more per m² to replace compared to single glazing. So a small extra cost for much added comfort.

Benefits:

Double-glazing will reduce your heat loss and condensation in the wintertime, adding significantly to the comfort and health of your home. Most new houses built in Christchurch will have double glazing as a standard feature – so upgrading your existing home to double glazing will help to maintain its value.

Household running cost savings					
Improved comfort and better health					
Increased capital value of the home					
Improved Homestar™ rating					

Talk to your builder and window manufacturer/supplier about:

- » Which windows will need full replacement of frames and which might just require new glass.
- » The difference in costs between single and double-glazing solutions.
- » Options for reducing window size on the colder southern sides of the building and positioning windows on the warmer northern sides to make the most of the sun's warmth in winter.

Note: on a list of priorities, getting your ceiling, underfloor and wall insulation installed are probably higher up than double-glazing. However, if you have to replace the windows anyway, then this is the ideal time for an upgrade.

Next steps:

1. Prioritise double-glazing in those windows that need to be replaced on the colder southern sides of the house as well as main living areas.
2. Use the links below to explore double glazing options and benefits.
3. Investigate pricing options for different types of higher performance glazing.
4. Discuss the best approach with your builder and window manufacturer/supplier.

HEATING AND CHIMNEYS



Challenge:

Fallen or damaged chimney or fireplace

Opportunity:

Replace your old heating system with a new, efficient and clean one.

Solution:

Remove or repair damaged chimney and consider more efficient alternative heating options such as heat pump or low emission wood or pellet burner. Block or remove open fireplaces. If retaining chimney for aesthetic or heritage purposes, an inset wood or pellet burner with a central flue up the chimney can assist structurally but you may also need to have it strengthened in case of future earthquakes - see EQC flyer, Easy Ways to Quake Safe Your Home.

Cost estimate:

Varies depending on situation, level of damage, and option chosen. Chimney removal between \$500 - \$1,000. Heat pump of an average size would have an installed cost of approximately \$4,000.

Low emission wood burner or wood pellet burner between \$3,000 - \$4,000.

Subsidies of up to \$500 or more are available from EECA to support the installation of clean heating devices, provided the house is well insulated. Further subsidies are available to replace chimneys.

Further info:

Websites:

EECA chimney replacement programme. This offers people whose chimneys were damaged the choice to replace their old log burners or open fires with a new, clean efficient heating system and the cost will be covered under their claim to the Earthquake Commission. www.eeca.govt.nz/eeca-programmes-and-funding/programmes/chimney-replacement

EECA grants information www.energywise.govt.nz/funding-available/insulation-and-clean-heating

EECA heat sizing calculator www.energywise.govt.nz/how-to-be-energy-efficient/your-house/heater-sizing-calculator

Benefits:

Keeping your home warm (18°C in living rooms and 16°C in bedrooms as minimums) is vital to your health and comfort, so proper insulation and an efficient heating system are a must. The typical New Zealand home uses about 35% of its energy on heating – so getting it right can save you money. Putting in an efficient system can save an average household up to \$500 per year compared to standard electric heating.

Household running cost savings				
Improved comfort and better health				
Increased capital value of the home				
Improved Homestar™ rating				

Talk to your builder about:

- » Ways to move the heat around the house – if you are having work done up in the ceiling, this could be a good time to think about installing a simple ducted heat transfer system to move heat from the living room to the bedrooms. They should be between \$300 and \$1,000 depending on the number of rooms you wish to connect.
- » Making sure you have good insulation in the house to trap in the heat.

Next steps:

1. Discuss options about removing the chimney and blocking off any open fires.
2. Investigate the potential for grants / loans assistance from EECA.
3. Investigate suitable heating systems with suppliers.
4. Discuss the project with your builder or heating specialists (e.g. your local Eco Design Advisor).

HOT WATER SYSTEMS



Challenge:

Broken or damaged hot water system

Opportunity:

Install seismic restraints (straps) around the hot water cylinder, or if badly damaged, replace with more efficient solar hot water or heat pump hot water system and upgrade piping and lagging (insulation around pipes).

Solution:

Remove the old damaged system and upgrade with either solar or heat pump hot water heating. Both systems are significantly more efficient than the usual electric hot water cylinder and, despite the higher up-front costs, this will save you money in the long run. Solar works best where you have a sufficient area of roof exposed to northerly sun throughout the year. If your house is heavily shaded by trees or other buildings, or if you don't have any north-facing roof space where solar panels can be mounted, a heat pump hot water system might be preferable – but make sure that it is capable of operating efficiently in Christchurch's climate.

If replacing the entire system, it could be a good time to reconsider how efficient your piping is. Try to avoid long lengths of hot water pipe runs and make sure all hot water pipes have good levels of lagging (insulation) around them.

Cost estimate:

Solar hot water and heat pump hot water system costs vary depending on size and set-up. An average system could be expected to cost about \$5,000 - \$6,000 installed. You may be eligible for a grant of up to \$1,000 towards this from EECA.

Further Info:

Websites:

EECA funding information www.energywise.govt.nz/funding-available/solar-and-heat-pump-water-heating-funding

Smarter Homes www.smarterhomes.org.nz/energy/water-heating

Consumer NZ report on hot water heat pumps www.consumer.org.nz/reports/heat-pump-water-heaters

Consumer NZ report on solar water heaters www.consumer.org.nz/reports/solar-hot-water-systems

Christchurch City Council services:

SOLAR HOT WATER CONSENT REBATE.

Christchurch City Council offers a \$250 reduction to the cost of permitting solar hot water systems. More information and application forms are available at:

www.ccc.govt.nz/homeliving/buildingplanning/buildingconsents/applicationpacks/solarwaterheaters.aspx

Benefits:

The average house in New Zealand uses 30% or more of its energy heating hot water – so it is worthwhile investing in an efficient system that will reduce your daily costs. A well installed and efficient system will significantly reduce your daily water heating costs – by as much as 75%.

Household running cost savings				
Improved comfort and better health				
Increased capital value of the home				
Improved Homestar™ rating				

Talk to your builder, plumber or hot water specialist about:

- » Your house set-up, the overall site and the best options for heating hot water. Think about how much sun lands on your roof or where might be a suitable place for a hot water heat pump cylinder.
- » Ensuring that the system you are considering is designed to work at low temperatures. Ask to see performance results at different temperatures and make sure it works efficiently in the Christchurch climate.
- » If opting for heat pump hot water, ensuring location of outside unit is suitable. Consider efficiency (the warmer spot the better), as well as the potential noise of the unit (you don't want to be kept awake at night or annoy your neighbours).
- » Investigate the option of installing high pressure water systems to eliminate the need for header tanks which are susceptible to falling or damaging the building during an earthquake.

Next steps:

1. Check out EECA's solar and heat pump hot water grant information to see if you qualify.
2. Discuss options with your builder or hot water specialist – assessing the whole house and site for the best approach.
3. Make sure that your installer is well qualified and has a lot of experience - research shows that the quality of installation is the biggest factor in how well your system will perform.

MATERIALS AND FINISHES



Challenge:

Damaged paintwork, joinery, carpets and furnishings

Opportunity:

Replace damaged materials and finishes with stronger, lighter, healthier and more environmentally friendly options.

Solution:

Specify products labelled with Environmental Choice New Zealand certification. Each product with an Environmental Choice tick is designed to have a lower environmental impact than a similar product without the tick. The eco-label is awarded by an impartial third party and shows that the product has been certified as meeting environmental performance standards. There are a wide variety of building products that are labelled with the Environmental Choice tick – these include paints, insulation, plasterboard, carpets and floor coverings and joinery.

Other tips include:

- » look for low or no VOC (Volatile Organic Compounds) levels in paint, glues, polyurethane and carpets.
- » choose sustainably sourced products, e.g. timber from a sustainably managed forest.
- » minimise resource use by selecting quality products that are durable, repairable and easily maintained.

- » use local products and services to support our local economy and to reduce transport emissions.
- » consider products which are either made from recycled materials, are renewable or which can be recycled themselves.
- » consider using lighter building materials such as timber wall cladding and metal roofs.
- » Cost estimate: In most cases, products with Environmental Choice certification are no more expensive than other similar products.

Benefits:

Environmentally friendly, and low VOC products are healthier.

Household running cost savings					
Improved comfort and better health					
Increased capital value of the home					
Improved Homestar™ rating					

Talk to your builder/tradesperson about:

- » The type of materials that will be used in the rebuild and ensure that they understand that you are specifying Environmental Choice certified products and Low VOC paints and finishes.

Note: Remember to keep evidence (invoices and supplier information) of the Environmental Choice products used in your rebuild so that you can claim points under the Homestar™ certified rating system.

Next steps:

1. Familiarise yourself with the Environmental Choice tick and investigate the products that you are thinking of using in your rebuild to make sure they comply.
2. Discuss the options with your builder and other tradespeople as well as product suppliers.



Cert.TM

Further info:

Websites:

Smarter Homes www.smarterhomes.org.nz/materials

Environmental Choice New Zealand www.enviro-choice.org.nz

Department of Building and Housing guidance on rebuilding and repairing homes in Canterbury:

<http://www.dbh.govt.nz/canterbury-earthquake>

Christchurch City Council services:

Eco-Design Advisor service - www.ecodesignadvisor.org.nz

LIGHTING



Challenge:

Damaged light fittings and existing inefficient recessed downlights

Opportunity:

Replace downlights and install energy efficient light bulbs while ceilings and/or lights are being repaired or replaced.

Solution:

Remove recessed downlights - these act as small chimneys sucking heat through your ceiling and insulation. Replace downlights and fill holes in the ceiling and insulation. Surface-mounted fittings could cover and seal the downlight hole, or install surface-mounted or pendant lights and fill any gaps in the ceiling plasterboard.

Ceiling or wall repairs offer a good opportunity to reconsider your lighting needs and options. Consider whether the location, brightness and number of lights could better meet your needs. Also consider greater control of your lighting, so lights that you are not using can be switched off. Painting walls and ceilings in light colours can also maximise the effectiveness of natural and artificial light.

Switch to efficient lightbulbs, such as compact fluorescent bulbs - these are easy to install, last longer and can save \$100 each, over the life of the bulb.

Cost estimate:

The cost of replacing downlights will vary depending on how many you have and whether you are repairing your ceiling anyway. As a stand-alone job, replacing a recessed light fitting with a simple pendant fitting would cost in the region of \$70.

Benefits:

More efficient lighting will reduce energy costs, while removing downlights will allow you to fill insulation gaps and keep heat inside the home, potentially saving you as much as \$250 per year.

Household running cost savings					
Improved comfort and better health					
Increased capital value of the home					
Improved Homestar™ rating					

Talk to your builder/electrician about:

- » The most effective lighting arrangement as part of your rebuild.
- » Rewiring for better control of lighting systems.
- » Adding more insulation to the ceiling once downlights have been removed.

Next steps:

1. Familiarise yourself with the 'downside' to downlights using the information sources below.
2. Talk to your builder and electrician about options.
3. Draw up a budget to carry out the work.

Further info:

Websites:

Consumer NZ downlight report www.consumer.org.nz/reports/recessed-downlights

Smarter Homes www.smarterhomes.org.nz/energy/lighting

RightLight

www.rightlight.govt.nz/residential/consumer-testing/downlight-test and www.rightlight.govt.nz/residential

EECA's Energywise website www.energywise.govt.nz/how-to-be-energy-efficient/your-house/lighting

A note on waste

To reduce construction waste going to landfill, and to gain further points in the Homestar™ rating tool, your builder and tradespeople should be encouraged to follow REBRI (Resource Efficiency in the Building and Related Industries) guidelines for waste management (see www.branz.co.nz/rebri). These provide information and advice on:

- » What materials can be recycled or salvaged.
- » How to develop a waste management plan.
- » How to set up a waste management system.
- » How to separate and store waste.

You may also be able to find ways of using waste material around your neighbourhood, e.g. your old bricks could be someone's new paving.

Obtaining consent

In most cases you will require a building consent to undertake any major repair work. Talk to your builder or the Christchurch City Council about obtaining building consent before starting any repairs. For more information, visit:

www.ccc.govt.nz/homeliving/buildingplanning/index.aspx

Builders' speak

What is an R-value?

The effectiveness of insulation is measured by its R-value. The higher the R-value on an insulation product, the more it slows down the transfer of heat. Generally, the R-value of insulation gets higher as the product gets thicker. For example, an R3.0 product has greater thickness than a R1.0 product of the same type. Using R-values helps you to compare the effectiveness of different types of insulation.

Finding tradespeople

Look for membership with reputable associations such as Registered Master Builders, Certified Builders, or Master Plumbers. Electricians should be registered with the Electrical Workers Registration Board, and plumbers and gasfitters with the Plumbers, Gasfitters and Drainlayers Board. Solar water heater installers must be accredited by the Solar Industries Association, and wood or pellet burner installers must be accredited by the NZ Home Heating Association. Heat pumps use refrigerants and therefore installers should have both electrical and refrigerant certification (HVAC engineer). The Department of Building and Housing has just started a Licensed Building Practitioner Scheme which has a list of all registered tradespeople

(see lbp.dbh.govt.nz/publicregister/search.aspx).

Under new building laws, tradespeople must be registered with this scheme in order to do certain kinds of work.

Christchurch City Council has also developed a list of accredited contractors for earthquake recovery work (see

www.ccc.govt.nz/business/constructiondevelopment/index.aspx)

Further sources of useful information

Detailed project management guidance and a more in-depth homeowner manual are available through a free download from: www.beaconpathway.co.nz/existing-homes/article/homeowner_manual_get_the_best_from_your_home

www.cea.co.nz

Community Energy Action is a Christchurch-based charitable trust committed to providing warm and healthy homes for all.

www.smarterhomes.org.nz

Run by the Department of Building & Housing, Smarter Homes is a comprehensive guide to making your home perform better. It covers energy, water, indoor environment, design, materials, construction, siting and landscaping, with good general advice on what to think about. You can download two key publications: Your Guide to Smarter Living and Your Guide to Smarter Insulation.

www.consumer.org.nz / www.consumerbuild.org.nz

Visit the Consumer website for independent testing and evaluations of appliances and heating/energy products and systems. Find out which brand is rated as giving the best performances and what issues to watch out for. The Consumerbuild website has independent advice on buying, building, renovating and maintaining homes.

www.level.org.nz

Developed by BRANZ (an independent building research company) in tandem with Smarter Homes, Level gives more detailed advice on building and renovating for the construction industry. Expect to find more technical detail here.

Community Energy Action Charitable Trust

Free advice on all home energy matters and associated renovations. Call 0800 388 588, email energyadvice@cea.co.nz or visit <http://www.cea.co.nz/charitable-programmes/#heac>.

For free insulation checks and free insulation and heating quotes (with government subsidies).

Call 374 7222, email info@cea.co.nz or visit www.cea.co.nz

www.ecodesignadvisor.org.nz

Eco-Design Advisors offer free and independent advice on home design. Home designs can be emailed to advisors and discussed over the phone or during site visits.

www.dbh.govt.nz/canterbury-earthquake

Department of Building and Housing website that provides guidance and information on building code requirements.

This pamphlet is a joint publication of:

