

September 2009

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Welcome

Greetings to you all and I hope you are all well after what has been a very cold winter.



And what a winter it was. In Gisborne, the average temperatures in May and June were 0.5 degrees lower than normal, and we had the unusual sight of snow in the hills above Gisborne.

My wood burner got a hammering, and power bills were less than a delight. However, July brought even more exciting weather. My family have only lived in Gisborne two years, so the flooding (the back lawn and under my house all underwater for a week) was not welcome – or expected.

Meanwhile our community partners have been busy assessing homes and developing renovation plans for you. As I write, the last home assessments should have been completed, and we know from our follow-up interviews that many of you have started to put your plans into action.

With spring have also come good renovation intentions around my own home. You can read more about that later in this newsletter.

If you need to contact me, email me at: loise@beaconpathway.co.nz or phone me at: (06) 867 4458

Kind regards

Lois

Update: HomeSmart Renovations

Home assessments complete

By now, all participating homes should have had their home assessment. If you are reading this newsletter and don't believe you've had a home assessment yet, please get in touch with me as soon as possible.

HomeSmart Renovation Plans nearly complete

After you have had your assessment, you will receive your Renovation Plan, as well as a Homeowner Kit with a manual on operating homes to achieve good performance, and information about project management of home renovations.

A few Renovation Plans are still outstanding and our partners (Community Energy Action, EcoMatters Environment Trust, Energy Options and EnergySmart) are trying to get these to you as quickly as possible.



We have had a few instances of plans being mislaid in the mail. If you haven't received yours, follow up with your assessor - their contact details are at the end of this newsletter.

If you have any questions about the recommendations on your Renovation Plan or how to prioritise your renovation, please contact your assessor. Their name will be on the front of the Renovation Plan and contact details are at the end of this newsletter.

Follow-up phone surveys

About half of you have now had a follow up phone survey about your experience in the project. If you haven't been called yet, you can expect an interviewer from CRESA to be making contact with you to do a follow-up interview about a month after your Renovation Plan and Homeowner Kit has been posted out to you.

Michael Webb and Lorraine Leonard from CRESA began phone interviews with homeowners earlier this year and will continue through early spring. Thank you to those of you who have already spoken with one of the interviewers.

Each interview takes approximately 15-20 minutes and covers a range of topics including feedback on your experience of the home assessment, whether the renovation plan you received met your expectations, and past and future renovation plans.

When the interviewer calls, they'll ask you if you have your Renovation Plan handy somewhere. This is because some of the questions refer to your plan and you may find it easier if you have the plan with you.

As part of the phone interviews, we are starting the collection of your energy (electricity and gas) and water (if you are metered) billing information.

Your plans to renovate may change, especially with the change in the economic climate. If you've had your assessment and Renovation Plan but your renovations are on hold, our interviewers would still like to talk to you about your experience of the process to date and any challenges in relation to the renovations.

Thank you in advance for assisting with the follow-up interviews. Your time is very much appreciated.

Does your home have a temperature monitor?

BRANZ would like to thank participants for returning the loggers quickly - the majority have been coming in on time and have provided good data.

They have, however, had some loggers arriving back several months after the swap over, meaning most, if not all, of the data may have been lost! So if you have any loggers waiting to be sent back, BRANZ would be very pleased to receive them.

Feel free to call Nikki on 0800 925 347 or at NikkiBuckett@branz.co.nz if you have any questions on the monitoring.



Subsidies and assistance for insulation and heating

EECA Warm Up New Zealand – Heat Smart Subsidies

Following on from the budget announcement of an allocation of \$323.3 million over four years to fit homes with insulation and clean heating devices, we now have a lot more information about how this scheme will work.

All homes built before the year 2000 can access funding towards insulation and clean heating.

If your house is un-insulated or poorly insulated, then a subsidy of up to \$1300 is available towards ceiling and underfloor insulation.

Once you have met EECA's minimum standard for insulation (which, unfortunately, is lower than we would recommend for a warm and energy efficient home) then you are also eligible for a subsidy of \$500 towards the cost of an efficient heating device – a pellet burner, low emission wood burner, efficient heat pump or flued gas heater.

If you have a Community Services Card, then you are eligible for a subsidy of at least 60% of the cost of the insulation and \$1200 towards the clean heating.

The scheme is delivered by a large number of companies who will do the supply and installation of the insulation and heating devices. It doesn't allow for subsidies on DIY insulation or heating installation because EECA are concerned that the quality of installation may not meet their minimum standards.

On the EECA website there is a lot more information about the programme, and who you can contact to get a quote. They list

installers by region so you can see that a wide range of companies are involved.

Now is probably a good time to start making enquiries about this programme, as there was an overwhelming response when the programme was first announced and providers have a backlog of enquiries to work through.

Find out more at:

www.eeca.govt.nz/eeca-programmes-and-funding/funding



Your questions answered ...

We've put our renovation plans on hold – should we still stay in this project?

For a range of reasons, some people have decided that they are no longer going ahead with their renovations. Even if this is the case, we are really keen for you to stay participating in the project.

Our research will continue until mid 2010. By continuing to stay in the research project (even if you are no longer renovating), you will be helping us develop better information to help other New Zealand homeowners renovate their homes for better performance.

Our research will also be used to inform government policy, but in order to be useful, we need to keep the majority of people in the project still participating.



I have received my renovation plan and I want more specific information on heating.

This is the most common question we have received. In most homes, Beacon recommends installing a large efficient heating device (a wood burner, pellet burner or efficient heat pump) and moving the heat around your home. In some cases this might need a heat transfer system, or you may need a small space heater (such as an oil column heater) as a supplementary heat source in a hard-to-heat bedroom.

At the time of preparing your Renovation Plan, your home assessor may make some more specific comments on heating, especially if there is an obvious solution for your home.

However, heating generally is something which is quite personal to people. In almost all homes, a range of heating options will be suitable – but it’s a matter of individual choice about what you like.

For example, I would not be parted from my wood burner – I love stoking it up until it roars and the heat comes off as I sit in front of it with the cat on my knee. And I regard the inevitable log splitting and wood carting as a useful form of winter exercise. However, if the choice was left to my husband, undoubtedly our house would be heated by heat pumps – we’d certainly have one in our bedroom if he had his way.

In order to help you with your heating choices, we provided some information in our last newsletter. We’ve added to this with more information on the pros and cons of different heating types in this newsletter.



Top tips: Choosing a Space Heater

Choosing a good heater is dependent on many factors, including:



- up-front cost/ongoing costs. The emphasis should always be on the *combined* costs – particularly as energy prices only go up, not down
- size of spaces to heat
- insulation levels

- amount of temperature control
- occupants’ personal preferences and aesthetics
- cheap fuel sources (e.g. wood burners)


The heaters listed over the page are *roughly* in order of Beacon’s recommendations. The *actual* order needs to take into account the preferences and needs of the people in the home.





Which heater to choose?

Heater Type	Pros	Cons	Good For
<p>Solar</p> 	<ul style="list-style-type: none"> ▪ Free, renewable, no greenhouse pollution. 	<ul style="list-style-type: none"> ▪ Requires thought in design process ▪ Not always available on the colder days ▪ Only heats during the daytime. ▪ Generally insufficient to heat a whole home unless it is very heavily insulated (well beyond Building Code) and carefully designed. 	<ul style="list-style-type: none"> ▪ A well chosen section and a well designed building with good year round sun. ▪ New houses and major extensions.
<p>Enclosed wood burner</p> 	<ul style="list-style-type: none"> ▪ Near-carbon neutral and renewable heating, ▪ Cheapest heater to run, ▪ Works even in a power cut. ▪ Can be combined with a wetback to provide hot water heating. ▪ Wide range of models available (8kW – 30 kW) means most houses can be heated by a wood burner. ▪ Loved most by cats. 	<ul style="list-style-type: none"> ▪ Generally are large heaters – at least 8 kW which can result in hot spots if the heat is not moved around through open doors or through a heat transfer system. ▪ Does require a dry space for storing wood. Stacking, chopping and moving wood are required. ▪ Older models and those burning damp wood can contribute to air pollution. 	<ul style="list-style-type: none"> ▪ Heating large areas. ▪ Where wood is cheap or freely available. ▪ Areas with poor electricity security.


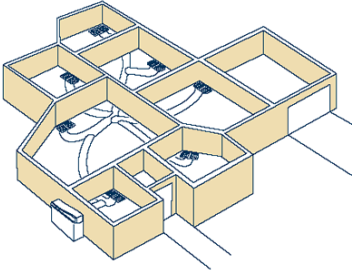


Heater Type	Pros	Cons	Good For
<p data-bbox="96 316 293 347">Pellet burner</p> 	<ul style="list-style-type: none"> ▪ Very clean burning ▪ Easy fuel source to handle and control ▪ Can heat very large spaces. ▪ Carbon neutral and a renewable heating type. ▪ By buying bags of pellets, heating costs can be managed on a weekly budget, although pellets are cheaper to buy in bulk. ▪ A fairly cheap way to heat. ▪ Can be combined with a wetback to provide hot water heating also. ▪ Are controlled by thermostat - some models have timers and remote controls to tailor operation 	<ul style="list-style-type: none"> ▪ Requires electricity to run. ▪ A limited range of wood pellet suppliers. ▪ Convective heat rather than the radiant heat of a wood burner. ▪ To warm whole house, heat needs to be moved around through open doors or a heat transfer system. ▪ Smaller output than wood burners (mostly 8kW -15kW) means large houses may find more than one pellet burner is required. 	<ul style="list-style-type: none"> ▪ Heating large areas





Heater Type	Pros	Cons	Good For
<p data-bbox="96 320 259 352">Heat pump</p>  	<ul style="list-style-type: none"> ▪ More efficient than other electric heaters and very efficient models are now available. ▪ Highly controllable - has a thermostat setting and, in most models, can be timed to switch on and off. ▪ Able to act as an air filter as well. ▪ A safe form of heating (fewer chances of accidental burns or fires than other types of heater) 	<ul style="list-style-type: none"> ▪ Efficiency reduced when outside temperatures drop below 7°C which increases running costs. ▪ Can stop working completely in deep snow or in very cold, humid conditions ▪ Given they are essentially a one room heater, they are expensive to install. ▪ Can be noisy (particularly for neighbours). ▪ Running costs, if used for cooling in summer, can negate any energy savings from winter. ▪ Heating costs can be higher than expected for those who have changed from a wood burner as their main heater or who have increased the amount that they heat. ▪ Must be installed by a qualified installer. ▪ Completely reliant on electricity supply 	<ul style="list-style-type: none"> ▪ Room-specific heating. ▪ Areas (such as Christchurch) where there are severe air pollution problems. ▪ Houses with small sections/limited room for storing wood or pellets. ▪ A good money saving option for people who are currently heating a lot with electric heaters.





Heater Type	Pros	Cons	Good For
<p>Flued gas</p> 	<ul style="list-style-type: none"> ▪ Fast. ▪ Responsive. ▪ A good use of gas (compared with burning it to make electricity in power stations). 	<ul style="list-style-type: none"> ▪ Unknown future in terms of supply. Not a renewable resource. ▪ Gas prices are now high, and line /bottle hire charges mean it's expensive if you are only using gas for heating. ▪ Generally only will heat one room. 	<ul style="list-style-type: none"> ▪ A range of space sizes. ▪ A good option if the house is already hooked up to the gas supply.
<p>Central heating</p> 	<ul style="list-style-type: none"> ▪ A range of fuel types possible (e.g. heat pumps, gas, diesel, wood pellet). ▪ Will heat the entire home to an even temperature. ▪ Can be timed to come on and temperature set using a thermostat. 	<ul style="list-style-type: none"> ▪ Not easy to retrofit into existing homes ▪ Heat losses occur from ducting under the floor or in the ceiling. 	<ul style="list-style-type: none"> ▪ Highly controlled heating. ▪ If the homeowner is always at home




Heater Type	Pros	Cons	Good For
<p data-bbox="96 316 533 352">Central heating with radiators</p> 	<ul data-bbox="629 320 1088 563" style="list-style-type: none"> ▪ A range of fuel types possible (e.g. electric, gas, wood, pellet, solar hot water). ▪ Controllable with thermostat and timer settings (some cover 7 days to allow weekend and weekday settings). 	<ul data-bbox="1108 320 1570 456" style="list-style-type: none"> ▪ Still expensive to retrofit in this country. ▪ Radiators can take up space in the house. 	<ul data-bbox="1635 320 2007 384" style="list-style-type: none"> ▪ Heats the whole house in a controlled way.
<p data-bbox="96 719 394 791">Electric convection (e.g. oil column, fan)</p> 	<ul data-bbox="629 722 1066 895" style="list-style-type: none"> ▪ Quiet. ▪ Can be operated on off-peak rates. ▪ Generally has a thermostat and some have a timer setting. 	<ul data-bbox="1108 722 1514 786" style="list-style-type: none"> ▪ Only good for smaller spaces. ▪ Provides indirect heat. 	<ul data-bbox="1635 722 2096 754" style="list-style-type: none"> ▪ Background heating of bedrooms.



Heater Type	Pros	Cons	Good For
<p data-bbox="96 316 342 347">Electric resistive</p>  <p data-bbox="456 507 517 539">(bar)</p>	<ul data-bbox="629 320 1037 424" style="list-style-type: none"> ▪ Highly responsive. ▪ Provides more direct heat – a good single person heater. 	<ul data-bbox="1108 320 1496 424" style="list-style-type: none"> ▪ Fire risk. ▪ Not very adjustable. ▪ Heats a person, not a space. 	<ul data-bbox="1635 320 2049 424" style="list-style-type: none"> ▪ Houses which have very good insulation, and where spot heating of a person is desired.
<p data-bbox="96 630 387 662">Under-floor heating</p> 	<ul data-bbox="629 635 1088 807" style="list-style-type: none"> ▪ A range of fuel types possible (e.g. electric, gas, diesel). ▪ Controllable with thermostat and timer settings (some with room-by-room control). 	<ul data-bbox="1108 635 1617 951" style="list-style-type: none"> ▪ Not possible to retrofit to existing homes without substantial renovation. ▪ Although fairly maintenance free, expensive repairs if something does go wrong. ▪ Not very responsive – takes time for the heat to build up. ▪ Carpeting over heated floor will trap heat under-floor. 	<ul data-bbox="1635 635 2092 767" style="list-style-type: none"> ▪ If the homeowner is always at home. ▪ Houses with very good under-floor insulation.



Heater Type	Pros	Cons	Good For
Unflued gas 	<ul style="list-style-type: none"> ▪ Fast. ▪ Responsive. ▪ High heat output. 	<ul style="list-style-type: none"> ▪ Most expensive operating costs. ▪ Produces a litre of moisture per hour. ▪ Produces toxic gases. Particularly bad for health of asthmatics, people with respiratory illness, children and older people. ▪ Needs to be operated with the window open. ▪ Heaters require an annual service. 	<ul style="list-style-type: none"> ▪ Not recommended.

Find out more about space heaters:

Consumer New Zealand has produced a range of reports on heating options:

- <http://www.consumer.org.nz/reports/heating-options>
- <http://www.consumer.org.nz/reports/choosing-a-heater>
- <http://www.consumer.org.nz/reports/woodburners>
- <http://www.consumer.org.nz/reports/pellet-burners>
- <http://www.consumer.org.nz/reports/heat-pumps>

Also try:

- <http://www.smarterhomes.org.nz/energy/heating/>
- <http://www.energywise.govt.nz/how-to-be-energy-efficient/your-house/heating-and-cooling>



From our researchers – what you need to know to get the best from your solar water heater

We've used solar water heaters in five of our research homes. Two were new homes, the Waitakere NOW Home® and the Rotorua NOW Home®. Three were renovations to homes in the Papakowhai Renovation project.

As each of these homes was part of a research project, our monitoring has told us a lot about how well the solar water heating systems worked. This data has recently been brought together and produced some useful hints for getting the most out of your solar system.

Timers and Controls

Control your supplementary heating. Solar water heaters allow for electricity to kick in and heat the water if there is not enough sun. But if your system immediately re-heats your water with supplementary electric heating after early morning water use, you miss out on using solar energy to re-heat the water during the sunny parts of the day.

Timers that are set to exclude electric supplementary heating in the mornings are a simple and practical way to avoid this.

Look for a system that provides information about how your system is operating to get a better understanding of when your household needs hot water and when the sun provides it.



This display in the Waitakere NOW Home showed the homeowners exactly what temperature their solar system was providing

Solar Panel Angle

We call on more hot water in winter than in summer, and well installed systems will ensure that your solar system will produce plenty of hot water even in winter sun.

Ensure your solar panel (collector) is installed at the same angle as the latitude of your location to get the best year-round performance.

Two of our solar water heating systems (the Waitakere NOW Home® and the Rotorua NOW Home®) were installed at shallow angles. They provided only 45% and 36% of hot water energy, compared to 75% from the well-angled Papakowhai panels.



The Waitakere NOW Home panels were only installed at 20° in line with the roof. It should have sat at 37°



The Rotorua NOW Home panel was limited to 30° by the framing that it came with. It should have been at 38°



The Papakowhai panels sat at 41° to match the latitude of the site



Sizing of System Components

Ensure that the collector area is sufficiently large for the demand required. Our Papakowhai systems connected two twelve-tube panels to form a large collection area – and their performance far surpassed the other, smaller, systems.

With a larger collector area, you will also need a larger hot water cylinder (300L cylinders matched the panels in Papakowhai) to ensure you can store the solar energy collected during the day for later use when hot water is required.



The large panels of the Azzuro Solar systems and 300L cylinders worked in balance for a good result in Papakowhai

Reducing Heat Losses

Ensure that heat losses from the systems are kept to a minimum. Make sure that insulation levels on cylinders are appropriate for New Zealand conditions and that pipe run lengths are kept short and well insulated.

The Rotorua NOW Home® cylinder was located outside on the roof and had higher heat losses than the other systems examined.



In both these cylinders you can see that the pipes moving hot water are lagged to prevent heat loss.

You can read the full report on our solar water heating systems at:

http://www.beaconpathway.co.nz/further-research/article/reports_and_presentations_energy

DIY - Lagging pipes is one of the renovations it's fairly easy to do yourself.

Coming up in December we'll cover:

- draught proofing
- wrapping your hot water cylinder / pipes
- installing a rainwater tank or barrel for garden watering
- checking out your ceiling cavity (i.e. relaying disturbed insulation after your plumber/electrician has been)
- laying a vapour barrier



In pursuit of a warm dry and efficient home – my home renovation

After the rigours of winter, we are back into the swing of home renovation at my place. However, the bad weather has reinforced the importance of dealing with the systemic issues which make our house too cold (not enough insulation and some really stupid locations and sizes of windows) as well as attending to the basics.

The heavy rain in July has brought the state of our gutters and downpipes to the top of the priority list, and when leaks started coming into our bathroom and dining room, we realised the roof was also in need of repair.

All that money spent on thick ceiling insulation last winter is being put at risk when the house fails some basic weathertightness considerations, so the plumbers have been called in to address these important issues.

A house with leaks and water coming in is much harder to heat – and it also has a very negative effect on the long term maintenance requirements of the home. We have plaster ceilings in the dining room and were particularly concerned that these didn't get damaged as a result of roof leaks.

Following the roofing repairs and gutter replacement, we are finally doing something about the giant southwest facing window in the master bedroom. This is the bane of our lives. In summer the western sun blasts in – we have the curtains drawn all day but it still overheats shockingly. In winter the opposite occurs – with the window feeling like a giant source of cold – and sucking all the heat out of the bedroom. I blame the window for our high winter power bills, and my temperature sensors tell a horrible tale about the temperatures in that room.

So we are removing the window (it's 3.2 metres long and nearly 2 metres high so really is GIANT) and replacing it with double glazed French doors and a small double glazed window – reducing the amount of glass area by over a third. Because the window faces southwest, we are getting low e glass (which helps to reduce heat loss but allows the room to be warmed by any sunshine installed) – it's a little bit more expensive, but performs much better thermally, and we are getting the glass slightly tinted to reduce the glare in summer.

We're also taking the opportunity to install wall insulation in the surrounding wall, and since we're faced with the complete mess anyway, insulating and relining the other exterior wall in that bedroom.

I'll let you know whether my high expectations of performance are met in our next newsletter.

Lois



My window – due for the chop!



Who is involved ...

... doing the research?

Beacon Pathway Ltd – we’re a research consortium dedicated to improving New Zealand’s houses. Government funding matches funds from our shareholders.

Key contact: Lois Easton

Phone 06 867 4458

Loise@beaconpathway.co.nz

CRESA – the Centre for Research and Social Assessment - is co-ordinating the monitoring and will be your main contact for surveys, homeowner agreements and monitoring.

BRANZ – the Building Research Association of New Zealand - will be undertaking the actual monitoring and analysis of how the homes perform.

Key contact: Nikki Buckett

Phone 04 238 1324

nikkibuckett@branz.co.nz

... doing the assessments?



Community Energy Action has done the initial Christchurch assessments. A charitable trust based in Christchurch, CEA is a leading installer of affordable insulation and offers a range of other home energy services.

Phone 03 374 5698

info@cea.co.nz



EcoMatters Environment Trust is doing the Auckland assessments and is finishing off the last Christchurch homes. EcoMatters is a charitable trust focused on sustainability initiatives.

Phone 09 826 4276

info@ecomatters.org.nz



Energy Options is a community owned organisation which is doing the Rotorua/ Taupo/ Marlborough assessments. They specialise in the retrofitting of insulation, renewable clean heating and solar energy solutions.

Phone 0800 151 561

info@energyoptions.org.nz



EnergySmart is undertaking the assessments in Wellington, Nelson, Dunedin and Invercargill. EnergySmart is a leading provider of energy efficient measures to New Zealand households across the country.

Phone 0800 777 111

info@energysmart.co.nz

... doing the renovations?

It’s your choice. Our partners, Community Energy Action, EcoMatters Environment Trust, Energy Options and EnergySmart are all experienced in energy efficiency improvements. They can help you with most energy renovations suggested in your HomeSmart Renovation Plan.

Or you can choose your own builder, plumber, or electrician to do the work for you.

