



Sustainable Renovations: From Auckland to Invercargill

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Leader

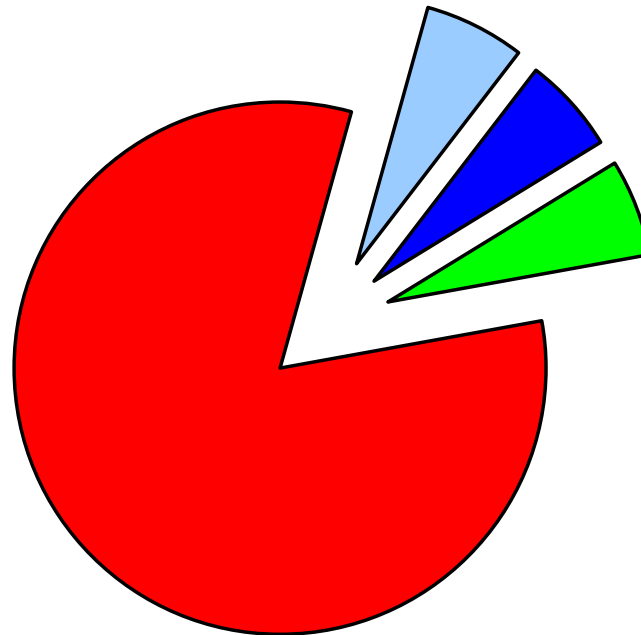


Creating homes and neighbourhoods that work
well into the future and don't cost the Earth

Scale of the challenge

1.7m NZ homes in 2012

- untouched
- minor renovations
- major renovations
- new build



Beacon's Renovation Research

- Consumer motivations and behaviors – energy
- Typology of housing for retrofit
- Cost benefits of housing retrofit
- Papakowhai Renovations – 9 home trial in Porirua
- Home*Smart* Renovations – national research project, all typologies, all income groups

Home*Smart* Renovation Project

Taking research findings and developing a range of best practice tools, guidelines, procedures and training materials for sustainable home renovation

Working with key community retrofit partners

Taking tools / guidelines and piloting in a 600 home renovation project across New Zealand

Homes monitored against Beacon's HSS High Standard of Sustainability® benchmarks (Energy, water, IEQ, materials, waste)



HomeSmart Renovations

Renovation Plan customised by assessor based on assessment using a Plan Builder tool



Homeowner Kit

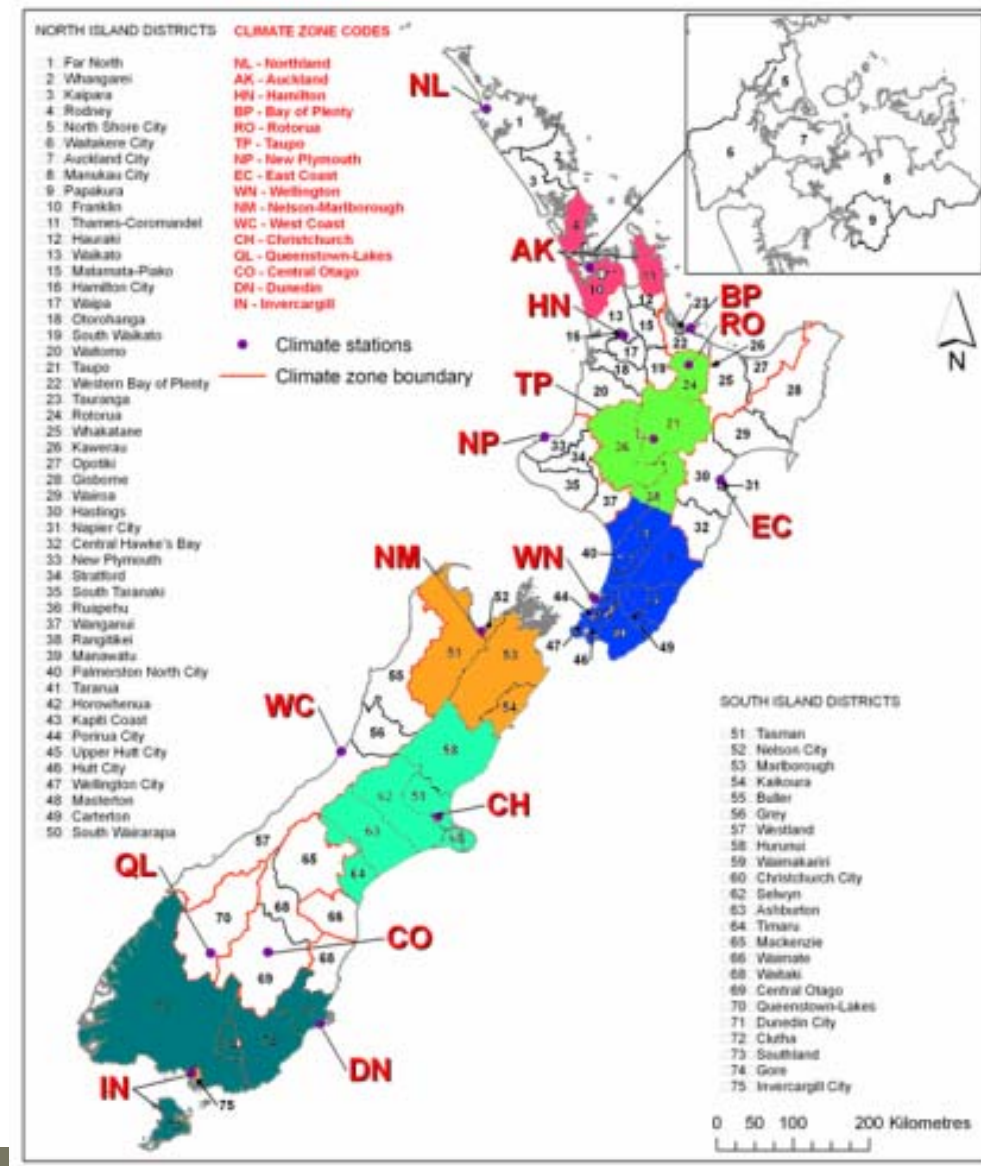
- Renovation Plan part of wider Homeowner Kit
- Homeowner Manual
- Project Management Guide
- Quarterly newsletters



Pilot Locations

Houses in six locations across New Zealand
Locations based on EECA Home Energy Rating Scheme (HERS) Climate Zones

- Auckland Region
- Rotorua/Taupo
- Wellington
- Nelson/Marlborough
- Christchurch
- Dunedin/Invercargill



Households

Sample across household income range

- \$0-\$50,000
- \$50,000 - \$100,000
- \$100,000 +

Renovations funded by homeowners – but accessing subsidies and assistance where available e.g. Energywise, Warm Up NZ, solar/heat pump hot water subsidies as well as local incentives e.g. Clean Heat and water efficiency programmes

Research Process

- 700 homeowners initially recruited (432 by project completion)
- 4 community partners trained and undertook assessments/developed renovation plans
- Preliminary information and self assessment (Homesmarts Home Health Check) undertaken
- Assessments/Renovation Plans for all homes
- Monitoring data collected for 200-home sub-sample
- Two follow-up homeowner interviews for each participating household



Recruitment

- People attracted to project because of independence of advice
- Most participants recruited via newspaper articles, word of mouth
- Interest in being part of a research project
- Interest from outside pilot area
- Very few rental properties included

Researchers looking for homes to make healthy

Research organisation Beacon Pathway is canvassing homeowners in the Rotorua area who are keen to improve their homes and are looking for information on where to invest. Assessors will show participants how to get the best return on their investment, by drawing up a detailed path to

Study to gauge if the sun shines on water heating

A new study will compare performance differences between solar and heat-pump water heating.

water research will need also to sign up for HomeSmart.

The HomeSmart Renovation project will explore the best combination of sustainable renovations to improve the performance of a home.

It is a large-scale demonstration and research venture with the goal of retrofitting 750 homes around New Zealand to Beacon's High Standard of

Renovators wanted for project

Research organisation Beacon Pathway, in conjunction with EnergySmart, is looking for 80 homeowners in the Nelson-Marlborough region who are planning to renovate between now and mid-2009.



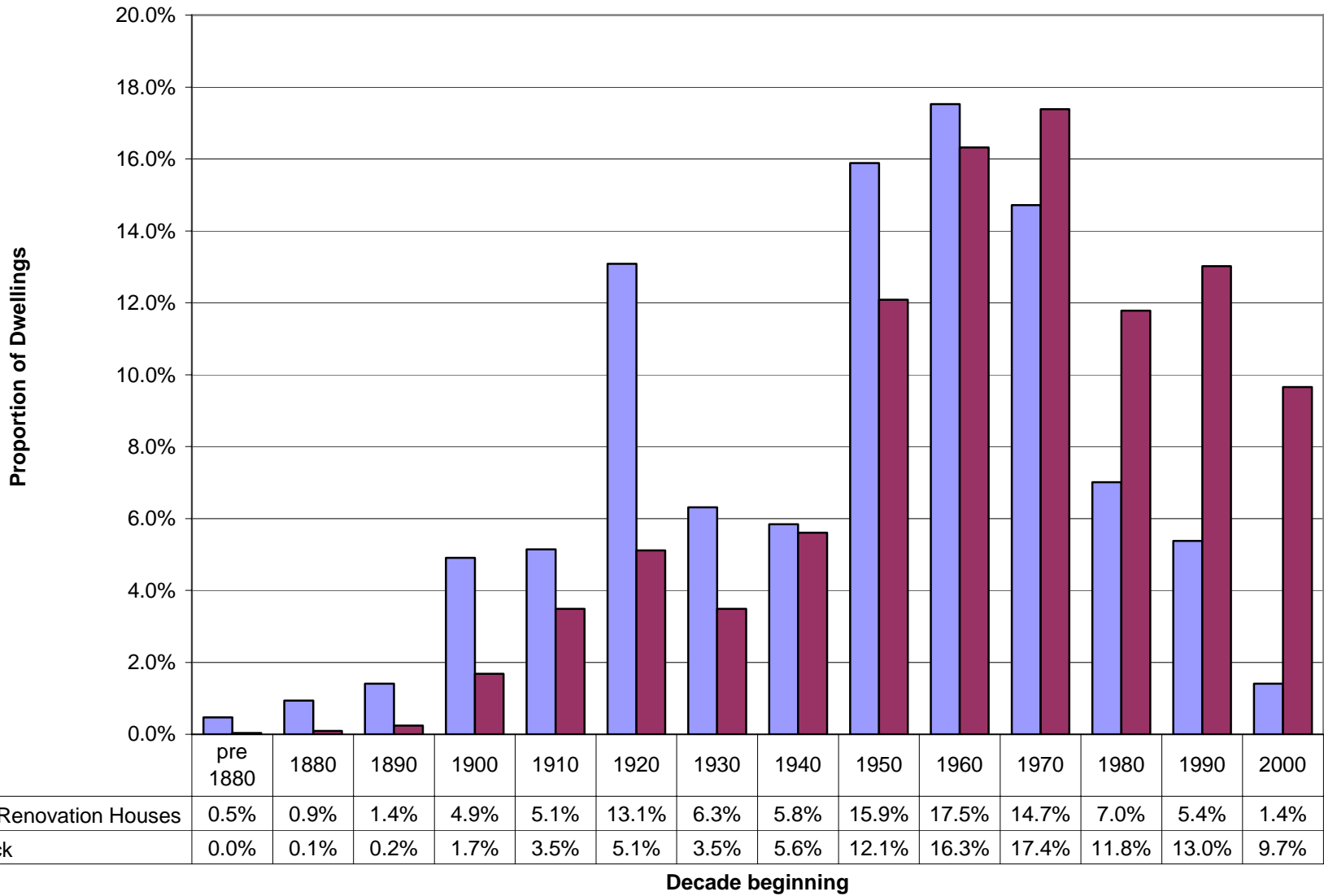
Who Participated?

Requirement that people intend to renovate in the next year in order to participate – so interested *and* able to fund

Household profiles

- 2/3 aged 31-50 years
- 58% have household incomes >\$70,000;
74% >\$50,000
- 62% households with 3 or more people
- 90% households with no-one older than 65
- 75% households with no pre-school children

Dwelling Age



Dwelling Condition

- Homeowners had a lower perception of dwelling condition than other surveys have found
- Participants are better judges of actual condition
 - Perceptions of poor performance may have led to participation
 - Information provided may mean more realistic in assessment
- Are a range of fundamental deficiencies in the dwellings

Perceptions on House Condition

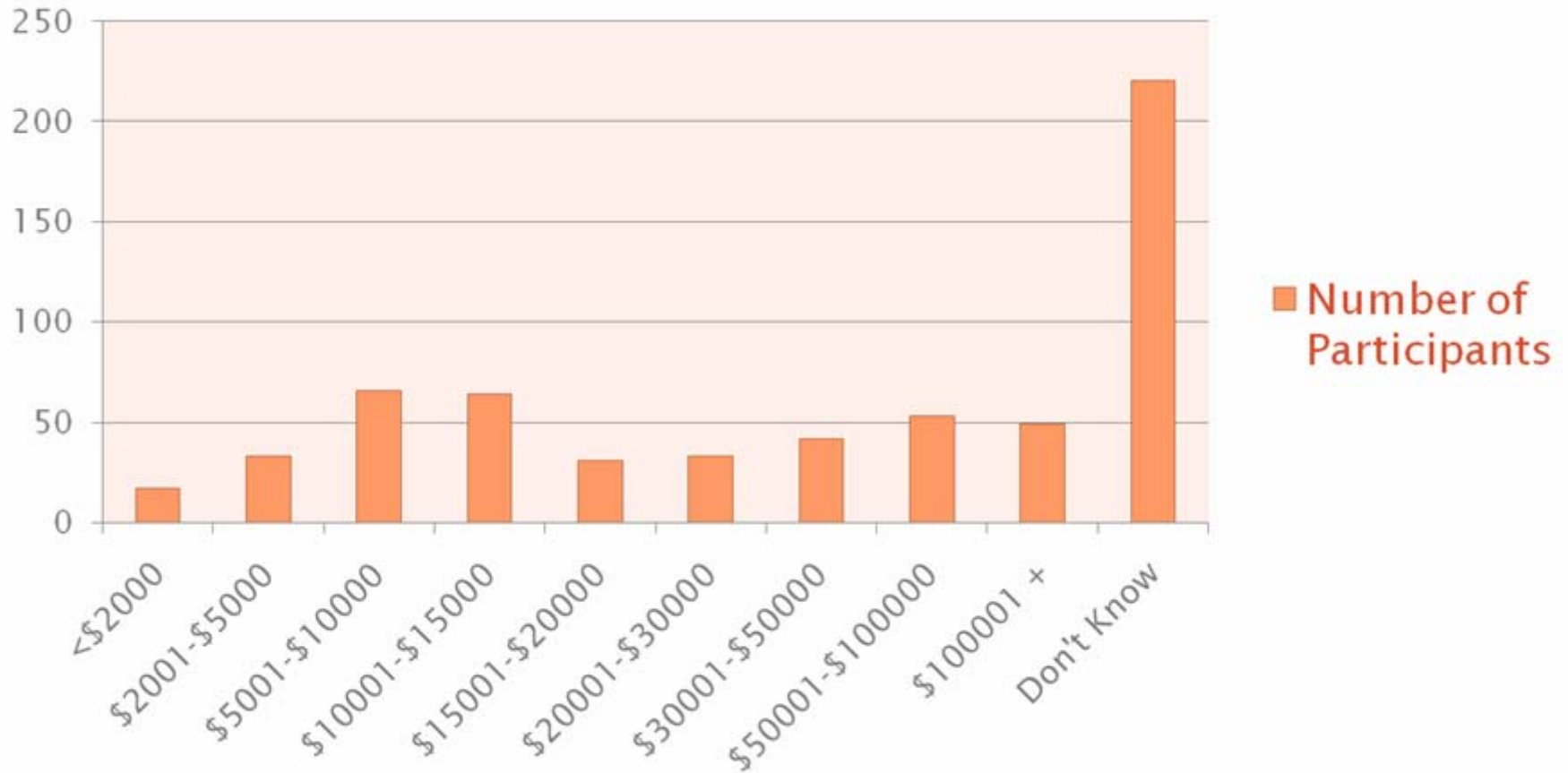
Study and Year	Excellent	Good	Average	Poor	Very Poor
2004 Repairs and Maintenance Survey	27.8%	50.9%	18.8%	2.3%	0.2%
Recent Movers Survey 2008	45.6%	37.4%	15.2%	1.7%	0.1%
High Energy User Survey 2008	32.7%	43.4%	19.7%	3.6%	0.6%
National Older People Repairs and Maintenance Survey 2008	46.1%	42.7%	10.2%	0.8%	0.3%
HomeSmart Renovation Households 2010	13%	39.3%	35.1%	10.2%	2.3%

Dwelling Problems

Assessed Problem	Number of Dwellings	% Dwellings
No ceiling insulation	32	7.2%
<75% ceiling insulation or <76mm thick	216	50%
Roof leaks	27	6.3%
Damp under floor	99	22.9%
Ponding underfloor	25	5.8%
No underfloor insulation*	189	41.2%
Window frames need replacement	41	9.5%
Draught stopping of doors needed	234	54.2%
No cylinder wrap	228	52.8%
No fire alarms	138	32.1%
External maintenance	250	57.9%

*where able to be retrofitted

Spending Intentions at Time of Registration



What they wanted to achieve

Outcome	Importance A lot	Importance A little bit	Importance Not at all	Don't know
Improved comfort/ warmth	67.6	24.3	3.2	4.9
House healthier	57.2	31.5	6.7	4.7
Environment	44.9	40.5	7.4	7.2
Power Savings	37.5	42.8	11.6	8.1
Easier to sell	30.8	44.4	13.2	11.6
Value to home	28.7	48.6	13.4	9.3

Response to the Renovation Plan

- 47% changed their intentions as a result of their renovation plan
- Well informed consumers wanted more specific information than provided
- Ongoing engagement and advice sought
 - Homeowner newsletter with personal examples
 - Email contact and phone advice
- Key gaps
 - Desire for product recommendations
 - Desire for more specific heating information



HomeSmart Renovations
Homeowner Newsletter

December 2008- January 2009

In this issue	What's underway? Assessments, renovation plans, temperature monitoring	Pages 2
	Your questions answered: subsidies, product information,	Page 3-5
	Top tips: Summer cooling in your home	Page 5
	From too hot to too cold: my own renovation (continued)	Page 6
	Who is involved? Contact details for renovation partners	Page 7

Welcome and thank you

For those of you who have only recently joined the project, welcome...
...and to those of you who have been with us for a while, thanks for your commitment to the project.

Our partners are now well underway with the assessments and development of your Renovation Plans. They have been really enjoying meeting you, our homeowner participants, and appreciate your enthusiasm and interest in sustainable building.

They have told us that some of you have already been making great efforts to make your homes more sustainable, and we look forward to hearing through the project about how you have found the information we are providing.

We are well aware that, for some people, getting the funding together to do anything on their home is hard. Throughout the project we will be continuing to try and find partners who can help people out with this side of things.

As part of your Renovation Plan we do provide some information about funding sources, and we will use this newsletter to keep you updated about any more.

You may have heard recently in the media that a quarter of all households have had their health affected by their poorly performing home. This ranges from colds and flu, to asthma and other respiratory illnesses. Our research is trying to find the best ways to address exactly this problem.

As someone who is in this group I also have been busy with my own home renovation. In our last newsletter I told you about the problems with my house, and I am pleased to say that already some of the actions I have taken have made a big difference to how my home is performing.

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

Kind regards
Lois

Update on the HomeSmart Renovations project

We have had a great response from people about being involved in the project, with around 300 people indicating they are interested in participating so far.

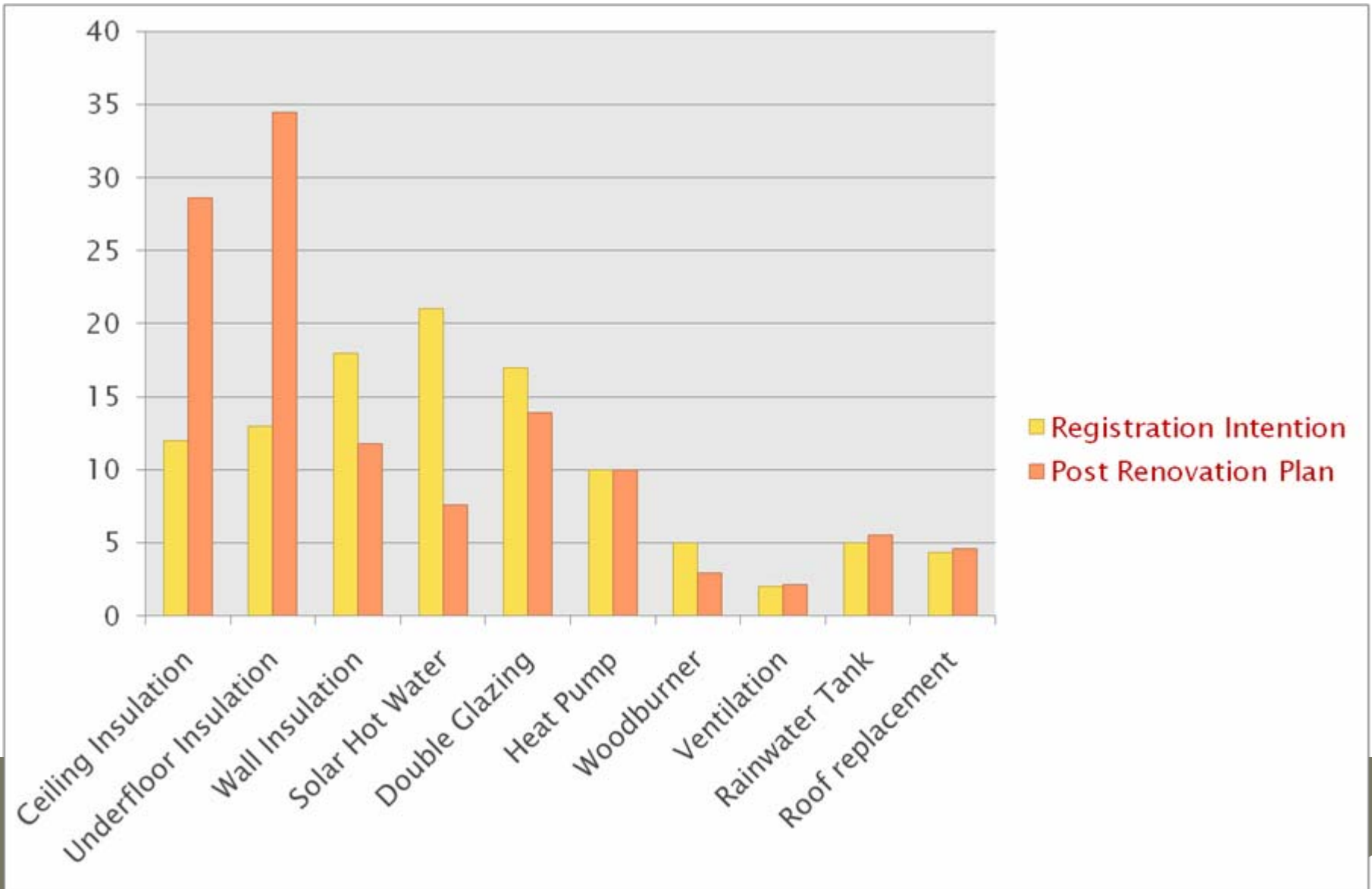
We are trying to recruit 750 people in total, so if you know someone who is planning to renovate their home in the first half of 2009, then feel free to spread the word! We'll be recruiting through to March 2009.

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Past and Intended Renovations

Renovation	% Undertaken last year	% Intended
Underfloor insulation	13.9	32.4
Ceiling insulation	15.5	31
Wall insulation	6.9	15
Double glazing	6.9	15
Heat pump	9.5	8.8
Solar hot water	2.8	10.2
Rainwater tank	0.7	4.6
Roof replacement	4.2	4.9
Replumbing	4.9	4.4
Extractor fan	2.3	4.9

Intentions – Sustainability Features



Doing the Retrofits

- At the first interview:
 - 23.5% reported using a tradesperson to act on plan recommendations
 - 19.1% undertook recommendations themselves
- Overall 73.6% took action based on the advice given
- Interest from homeowners in assistance with retrofits and in identifying suitable installers
- Recession meant some people changed spending intentions or pulled out



Advice vs Action

Recommendation	Acted on recommendation
Ceiling insulation (n=191)	65.4
Underfloor insulation (n=176)	56.3
Heating (n=226)	47.3
Wall insulation (n=214)	33.2
Double or secondary glazing (n=255)	24.3
Thermal curtains (n=156)	7.7
Bathroom extractor fan (n=111)	7.2
Rangehood kitchen extractor (n=104)	6.7
Pelmets (n=241)	0.8

Monitoring Results

Like most New Zealand home, the homes in the Home*Smart* Renovation project were:

- cold
- damp
- worse in the bedrooms
- inefficient energy and water users

Winter Living Room Temperatures

Period	Minimum	Mean	Median
Morning	8.78° C	13.98° C	13.88° C
Day	9.85° C	15.91° C	15.87° C
Evening	11.86° C	17.79° C	17.85° C
Night	10.63° C	16.01° C	16.07° C
24 hours	10.63° C	16.01° C	16.07° C

Winter Bedroom Temperatures

Period	Minimum	Mean	Median
Morning	7.98° C	13.18° C	13.42° C
Day	8.13° C	14.57° C	14.64° C
Evening	8.45° C	15.18° C	15.38° C
Night	8.24° C	14.43° C	14.61° C
24 hours	8.24° C	14.43° C	14.61° C

Cold Winter Temperatures

Location	Living Room Below 18°C	Bedroom Below 16°C
Auckland	87.5	90.6
Bay of Plenty	67.9	92.9
Wellington	88.0	100.0
Nelson/Marlborough	75.0	94.1
Christchurch	75.0	96.0
Dunedin/Southland	89.7	95.5

Damp Homes

Research Area	Humidity Gauge Activated
Auckland	72.4%
Bay of Plenty	69.2%
Wellington	69.2%
Nelson/Marlborough	66.7%
Christchurch	38.7%
Dunedin/Southland	46.2%

Downlights

Number of Downlights in Dwellings	% of Dwellings
No recessed downlights	54.4
1-10	42.7
11-20	11.3
21-30	3.7
31-40	0.9
More than 40	0.7

Energy Use

HSS® Benchmarks	% Dwellings Meeting Benchmarks
Climate Zone 1: 6,200	50.0
Climate Zone 2: 7,300	43.3
Climate Zone 3: 8,400	55.8

Water – Perception is Not Reality

- 65% had high flow water taps
 - 68% had high flush toilets
 - 38% used outdoor water at least once a week (for garden watering/boat washing etc)
 - 70.9% believed they weren't high water users
- But
- only 45.1% met the HSS[®] benchmark for water use

Water Use

Water Consumption Measure	Mean (litres)	Median (litres)
Annual Average per Dwelling	225,116	131,301
Daily Average per Dwelling	666.8	359.7
Average Daily per person per Dwelling	239.1	147.1

Water Use and Location

Compliance with HSS	Auckland	BOP/ Wellington	South Island
Above HSS	32%	87%	68%
Below HSS	68%	13%	32%

High water users are also likely to be:

- Not in metered areas
- High energy users
- Have instant gas hot water systems
- Have large dwellings
- Have high incomes

Conclusions

- People attracted to participating in the research because of free, independent advice
- Outcomes sought related to warmth, comfort and the environment more than economic returns
- 73.6% took action based on the advice given – insulation was prioritised
- Ongoing engagement increased educative value
- Participant households are more realistic about their house condition but no more resource efficient than the general population

Researchers Involved

CRESA – Kay Saville Smith, Ruth Fraser, Mike Webb, Lorraine Leonard

BRANZ – Nikki Bucket, Lisa French, Michael Camilleri, Andrew Pollard

