Sustainability Victoria.

Volume Home Builder Research.

Final Report.

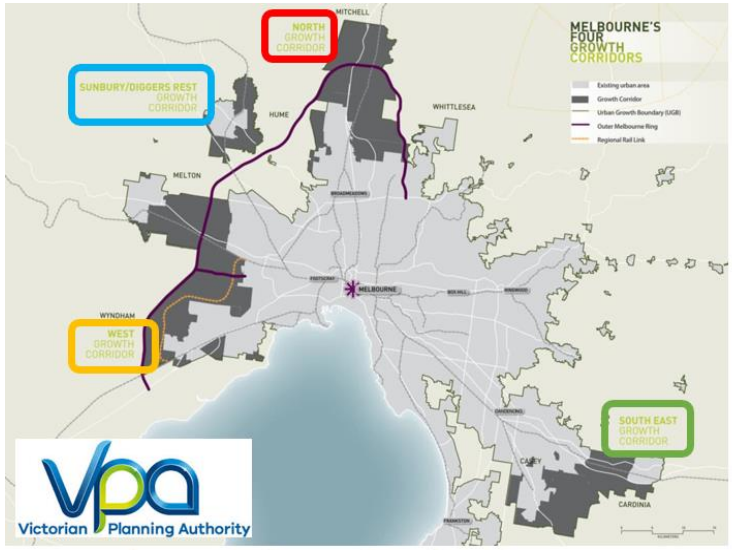
May 2018

colmar brunton.

1: Background & methodology.

Background to the project.

- In order to understand the Volume Home Builders market and its key stakeholders, Sustainability Victoria commissioned Colmar Brunton to conduct market research to further inform the design of the 'Volume Home Builders' Project.
- The VHB project's objectives are to:
  - Improve the supply of Zero Net Carbon (ZNC) homes by Volume Home Builders
  - Increase consumer demand for Zero Net Carbon (ZNC) homes.
- Sustainability Victoria identified the four key growth areas that were the focus of the market research (right).



The corridor plans make provision for the following populations and jobs:

	DWELLING CAPACITY	POPULATION CAPACITY	JOBS CAPACITY
WEST	136,000 to170,000	377,000 to 479,000	164,000 to 202,000
NORTH	93,000 to 117,000	260,000 to 330,000	83,000 to 105,000
SOUTH EAST	83,000 to 103,000	230,000 to 291,000	86,000 to 110,000
SUNBURY/ DIGGERS REST	26,000 to 32,000	71,000 to 90,000	10,000 to 15,000
TOTALS	338,000 to 422,000	938,000 to 1,190,000	343,000 to 432,000

Overview of the market research.

Methodologies.
The market research commenced with a Rapid Evidence Assessment, followed by qualitative interviews with developers and builders. Focus then shifted to buyers of Volume Homes using a survey and focus groups.

Sustainability Victoria.

Volume home builder research.

Rapid Evidence Assessment.	Interviews with Builders and Developers.	Survey of potential and past buyers	Focus groups with buyers	Evidence synthesis
Review of 26 articles supplied by Sustainability Victoria	Qualitative research with 10 VHB and LDs	Survey of 108 potential and 102 past Volume Home Buyers	Three focus groups of past and potential Volume Home Buyers	Bringing it all together to form conclusions and recommendations

Contents of this report.

This report: Contents and structure.

This report contains five chapters. The first is this introductory and summary chapter. Each stage of the research is then presented in reverse-chronological order. I.e., the final project stage (focus groups) is presented first, followed by the buyer survey, builder/developer interviews etc.

Each section has its own explanation and summary of key findings. A listing of page numbers for each chapter is provided below.

1 Overview and summary

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Summary of findings on one page.

Based on all evidence, key challenges and potential solutions are ...

Key challenge

Volume Home buyers' relationship to sustainability features is characterised by:

1. High awareness of these features in a very general sense
2. Moderate to low consideration of features during planning influenced by
   - A lack of understanding of costs and benefits
   - Being inundated with other considerations that act as a distraction
3. Very low uptake, particularly in relation to general consideration (Point 2).

Volume Home buyers' strategy to inform their decisions:

- Is almost entirely controlled by the builder
- Focuses on display villages that are designed and staffed by the builder
- Is supplemented with information from websites designed and hosted by the builder.

The builder has little motivation to sell or provide information about sustainability features because demand is believed to be low. Any linkage between awareness/consideration and purchase is therefore broken.

Both the literature and builders themselves indicate that this state of affairs is unlikely to shift without stronger, more stringent regulation of building standards.

Potential solution

Speak to Volume Home buyers through the primary (and possibly only) channel available:

- Presence at display homes
- Materials available to take home, or ideally presence in builders' promotional materials.

Use messaging that speaks to immediate and tangible benefits in a positive tone:

- Emphasise cost savings, e.g. for energy bills and associate sustainability with 'a quality build
- Provide evidence of savings using real-world numbers.

Avoid:

- Appeals to notions of social or environmental responsibility.
- Negative messaging that implies that a buyers' home will be inferior if sustainability features are not selected.

Second/third etc. home buyers are likely to be an easier target to begin with.

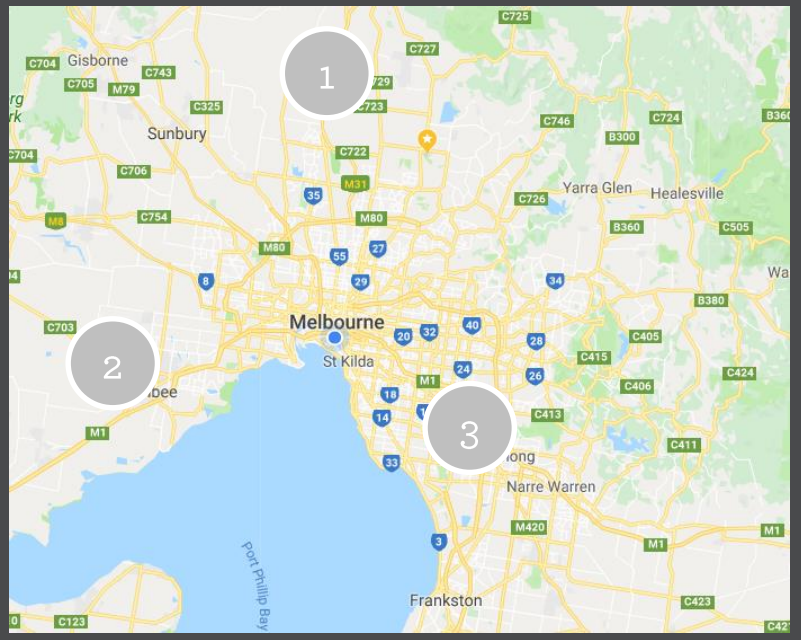
- They have gone through the process before and are likely to be less inundated with new information.
- They are likely to have a higher budget due to the sale of a previous home.

Sustainability Victoria could work with the Minister for Energy, Environment, Climate Change and Suburban Development; and the Minister for Planning to shift the industry to a higher standard than the current 6-star rating which is considered modest by some stakeholders.

2: Focus groups with Volume Home buyers.

Focus group methodology.

- Three groups were conducted in March 2018.
- One group was conducted in the northern suburbs, one in the west and one in the south-east.
- Two groups were attended by six participants, one by five participants.
- Participants represented a mix of past and potential Volume Home buyers.
- The groups each lasted 90 minutes.
- Each group included exploration of:
  - The purchase pathway including research to inform decisions
  - Key considerations in the design of a new home
  - Attitudes towards sustainability features such as solar panels and water tanks
  - Reaction to proto-type messaging to encourage uptake of sustainability features
  - Reactions to a potential 'ZNC home package' of sustainability features.



"Verbatim quotes from participants are shown in blue break-out boxes.

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Key findings from the focus groups.

Choice of a VH.

- The main motivator shaping the choice of a new home was to build a personalised 'castle' or 'paradise'. Underlying these motivators is a feeling of 'control' over a home – being able to choose what goes into different aspects of the build to be perfectly suited to the needs and aspirations of a family.

Research strategies

- Research strategies often do not happen sequentially. Use of internet, consultation with friends/family and engaging with sales-people happen all at once. This could be summarised as 'immersion' in the building lifestyle.
- Research online typically focussed on searching builders, subcontractors and locations (by name). Searching for specific features outside of information provided by builders is less common. Display villages are likely to be a key intervention point for Sustainability Victoria – more so than internet.

General consideration sets

- Sustainability features are very low in participants' consideration sets; in favour of quality, comfort and size.
- The very notion of 'minimising running costs' was either not well understood by participations; or was interpreted in a range of different ways that do not necessarily equate to the features that are the focus of this project.
- Comfort and quality were not at all associated with sustainability features in the minds of participants. Comfort is often associated with soft furnishings. Quality is about building features that you can see. Participants viewed these features in parallel, rather than in an inter-related 'package' for a home.

Consideration of sustainability features

- Knowledge of the existence of sustainability features is not a major barrier to purchase. Many participants could easily name features off the top of their heads.
- Participants struggled to explain barriers and enablers of choosing sustainability features in any detail. For most, solar water tanks etc. were simply not on the radar as they had never been put forward by anyone in the construction industry.
- Understanding of the costs and benefits of solar is generally either non-existent, or wildly inaccurate.

Key findings from the focus groups.

Messages

- Five prototype messages were tested, based on themes about environmental responsibility, adding value, saving money over time and linking sustainability features to quality.
- The message about long-term savings was probably the most effective as it appealed to participants' financial needs and gives concrete examples. Appeals to environmental responsibility and non-specific linkages to quality had less impact.

Save money by investing in solar panels, double-glazing, efficient fixed appliances and good insulation for your new home. For example, a top-of-the line solar unit costs $10,000 and will save you $1,200 per year for a family household – about the same as rego and insurance for a car. This means they will pay for themselves in about eight years. Also, insulation can reduce your heating and cooling bills. For more information about how you can add start saving money with these features, click here or ask your builder.

ZNC concept.

- Reactions to the Platinum Package ZNC concept varied greatly from participant to participant.
- Some described these features at this price point as a 'no brainer' others would not consider the package at all due to cost or scepticism that the sustainability features would deliver as promised.
- This wide range of reaction appeared to be most associated with:
  - Plans for length of occupancy – those planning to stay in their home for the longer term seemed far more receptive
  - Budget – participants who with additional funds were more open to the additional expenditure
  - Existing knowledge and openness to sustainability features.
- The presence of the solar power plus battery is key to appeal.
- 'As built verification' and 'energy efficient design denatures' were not easily understood.
- Participants would only make minimal sacrifices to other features to accommodate the package.

The package costs $15,000 and can be added to a new build. It includes: High performance design specifications such as double glazing, extra insulation, energy efficient design features. – Features that could add up to $13,000. Energy-efficient appliances and systems such as hot water systems, and an air conditioner. Features that could add up to $3,500. On-site renewable energy generation using a solar system and potentially battery. – A value of about $10,000. 'As built verification' a guarantee that the original design is delivered, and the quality of the build is verified.

Motivators underlying choice of a Volume Home.

Experiences and purchase pathways.

The volume home buyer market is diverse ranging from first home buyers through to buyers who are purchasing their fourth home to live in as part of a ‘home upgrade path’.

- The composition of the focus groups highlighted the diversity of Victorian home buyers and owners.
- While many were first home buyers, others reported a wide range of home building, buying and selling patterns.
- For example:
  - Some were buying their second, third or fourth home, sometimes as an investment property, though more typically as an ‘upgrade path’ where a succession of homes were purchased as families grew or more money became available
  - In one very specific example – a participant was ‘downgrading’ her home - following a change in living circumstances, this participant was demolishing her five-bedroom volume home to be replaced with a smaller three-bedroom volume home on the same site.
- This range of experiences led to differences in levels of knowledge of volume home options and effective design of a home.
- Regardless of the experiences or buying stage of these participants, each are potential targets for encouraging the inclusion of sustainability features in their new home.
- Any messaging about sustainability features of a volume home should not assume a simple two-part market of first and second home buyers.

Reasons for choosing a Volume Home.

The main motivator shaping the choice of a new home was to build a personalised ‘castle’ or ‘paradise’ where the buyer and their family can live. ‘Home’ being the operative word in this sentiment, over a ‘house’.

- Participants described the choice of a volume home as being driven by the opportunity to create a custom-made ‘haven’ – a personalised private space where a dream lifestyle could be achieved.
- A sense of family, community, and socialising in this haven were very strong motivators for participants.
- Participants had a focus on family and friends, creating a welcoming space where they could host events and share positive experiences. This led to discussions about the size of land and home. A large piece of land enabled a big house with many needs catered for, it also came with the possibility of a back garden where shared memories could be created.
- This was particularly true for certain types of participant, predominantly with larger families who could not afford the large house they desired in the existing established home market.
- Other motivators for choosing a volume home included being an affordable escape from ‘the rent trap’.

> “I want something peaceful and quiet where I can have animals and barbeques in the backyard and a nice safe neighbourhood.

> “I come from a massive family and although it’s not a competition, but I want to tick the box and say I did it mum

> “I’m looking for a fun lifestyle with the people around us, Christmas functions and parties. It’ll be communal, we want to know everyone around us but the blocks are big so not too close

Reasons for choosing a Volume Home - control.

Underlying these motivators is a feeling of ‘control’ over a home – being able to choose what goes into different aspects of the build to be perfectly suited to the needs and aspirations of a family. Buying an existing property was therefore less desirable, as less control could be exerted.

- An underlying motivator for choosing a volume home was a sense of ‘being in control’ – though the limitations of builders and design options were noted.
- This included control over the house itself in terms of number of rooms, appearance and layout; but also the garden with some wanting a large green space while others wanted a very small low-maintenance space.
- The option of buying an existing property regardless of its age negated this sense of control, or at least made control more difficult as a property may require renovations or extensions.
- Messaging about environmental features could try to appeal to this sense of control – for example, control over heating, cooling, energy bills etc.

> “This is the last house I am ever going to live in. The last of many. So I am going to be in control of what is in it.

> “You get to choose everything – rooms, fittings right down to the appliances. Well, almost everything. You do get to learn what you can and can’t have from some builders quite quickly

> You can make it your own, rather than buy some else’s dream you can buy something that is perfect for your family.

Influencers and research.

Research pathways.

Research strategies often do not happen sequentially. Use of internet, consultation with friends/family and engaging with sales-people happen all at once. This could be summarised as 'immersion' in the building lifestyle.

- The most common research pathway for participants was to 'immerse' themselves and their families in as much information as possible. This commonly includes:
  - Internet searches;
  - Visits to display homes – as many as 30-40 before a final decision is made;
  - Review of large volumes of hard-copy information collected at the display homes after the fact – different materials are often laid out side by side to compare options;
  - Advice from friends and family who have also built a Volume Home;
  - Advice from any trades person or real estate professional in buyers' social networks, or via referral from a friend – being able to consult with these professionals 'offline' was seen as being very valuable.
- While some participants engaged in all of these activities in parallel, a others described a more sequential research strategy that started with the internet and then shifted to in-person attendance at display homes.
- Participants typically reported that this process took more than a year – 12 months to three years. Searching and researching tends to 'ramp-up' for an intense six month period before purchase.
- Sustainability Victoria is likely to be most successful in reaching Volume Home Buyers at display villages, including follow-up messaging in hard-copy materials that buyers take away with them.

> "Oh my god, the display homes! So many display homes! I think I went to 30, 40, more for a year *every … single … weekend.*

> "… and then you take all of the books and the brochures away with you and you spread them all out next to each other on the table and you try to compare it all.

> "I went straight to the display homes, but when online I downloaded all the descriptions of homes from each builder, so I could compare.

Research pathways – use of internet.

Research online typically focussed on searching builders, subcontractors and locations (by name). Searching for specific features is less common. Display villages are likely to be a key intervention point for SV – more so than internet.

- All participants used the internet in some capacity to inform themselves about Volume Homes in some capacity.
- However, internet searching tended to take a very specific form:
  - Searches were done by different building companies;
  - Some participants also searched for specific models of home offered by a particular builder;
  - Others searched for subcontractors who may also work on the home.
- Participants did not describe searching directly for particular features, materials or designs – this was all done via the builder and the information that they provide.
- This means that investment in internet advertising using Google keywords for example, may not be effective unless it can somehow be done in conjunction with a builder.
- A small number of participants reported using forums and social media to inform their decisions. However, these resources were thought to be of limited value as:
  - Reviews on social media were always mixed with some good and some bad, making a clear decision even more difficult
  - Independent forums related to a specific builder or model of house were active, though tended to contain more questions asked by forum members than answers.

> "You just Google the name of the builder. Or maybe the sort of house you are looking at. They will be making it for you anyway and they give you loads of information on their websites.

> "I did look at some of the Facebook sites, but you can't tell anything.
> For every builder, some people are happy and leave good reviews, other people are not happy and leave bad reviews. Its all the same.

> "I I go to the builders' websites and then enter key words…like butlers' pantry, alfresco, pot drawers, soft close drawers.

Consideration set.

Consideration set.

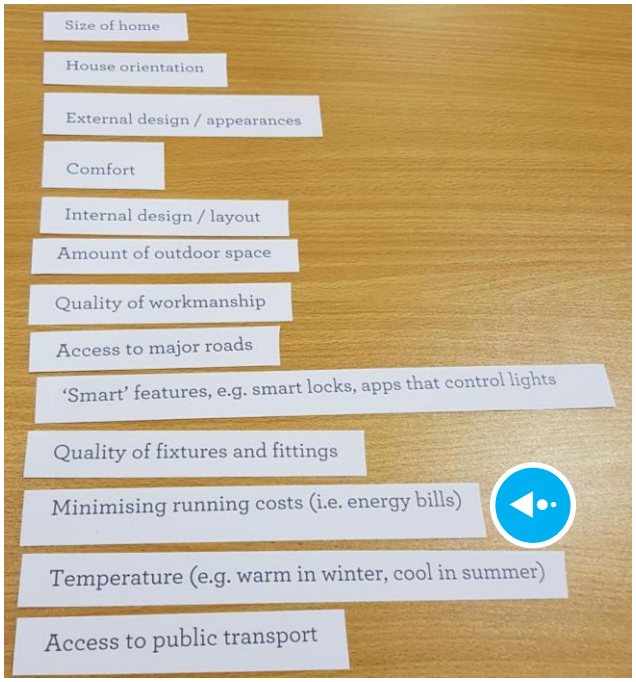
- External design / appearances
- Internal design / layout
- Quality of fixtures and fittings
- Temperature (e.g. warm in winter, cool in summer)
- Quality of workmanship
- Size of home
- House orientation
- Minimising running costs (i.e. energy bills)
- Comfort
- ‘Smart’ features such as smart locks, apps that control lights
- Amount of outdoor space
- Access to public transport
- Access to major roads

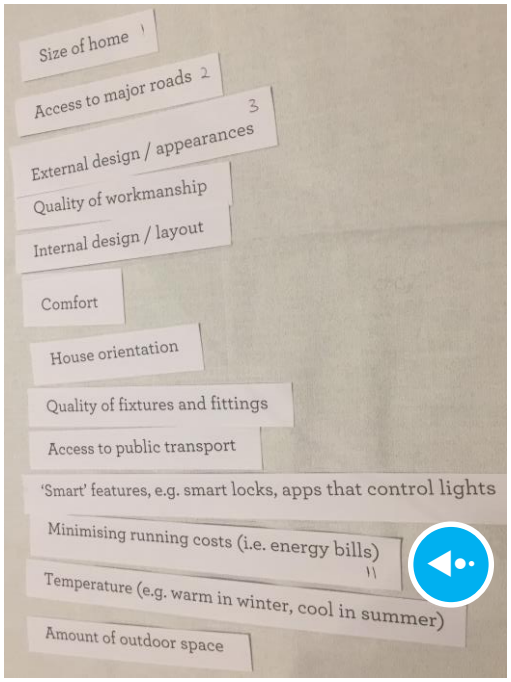
- Participants were given cards with different design considerations written on them.
- The design considerations mirrored a set of response options from the online survey conducted for the project.
- They were asked to sort them into a ranking of the most important consideration through to the least.
- The placement of ‘running costs’ as a proxy for sustainability features was noted and formed the basis for further discussion about solar, water tanks etc.

Consideration set – placement of sustainability features.

Sustainability features – running costs etc – are very low in the consideration sets; in favour of quality, comfort and size. The relative ranking of these features mirrors that found in the survey conducted for this project.

- For most participants, considerations around running costs were ranked well down the list – not necessarily at the bottom though typically rank 8-11 out of the 13 options.
- The size of the home and quality of workmanship were often ranked highly, if not first, by most participants.
- The highest ranked items varied amongst participants with some placing greater emphasis on location and infrastructure than others.
- Consideration of the orientation of a home varied greatly, with some paying very close attention to this detail and others having never thought about it at all.
- A small number of participants did rank running costs in the top four, particularly those who planned to live in their homes for longer periods.
- Some typical examples of the ranking exercise are shown to the right.



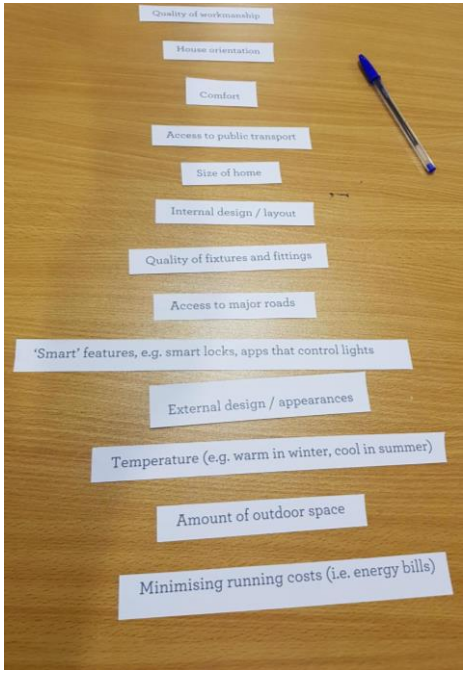


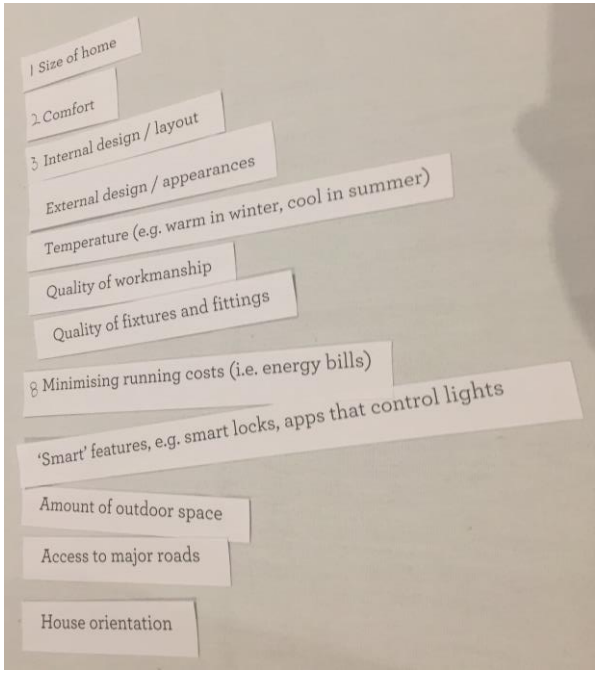
> I For me it was size, I wanted the biggest possible piece of land as I didn't know what I wanted to build.

Consideration set – thinking about running costs.

The very notion of ‘minimising running costs’ was either not well understood by participations; or was interpreted in a range of different ways that do not necessarily equate to the features that are the focus of this project.

- Following the ranking exercise, the moderator specifically queried the placement of ‘minimising running costs’ as a form of sustainability feature that could be included in a home.
- A possible reason why this option ranked so low is that participants had a varied understanding of how one could minimise running costs and few related this option directly to features such as solar and water tanks.
- For example – some thought about putting rugs on timber floors, others explained how they had considered investing in heated slab flooring.
- As such, participants saw these types of considerations as happening after a build, not something that requires attention at the time of design.
- Sustainability Victoria will need to form an explicit link in people’s minds between sustainability features and savings on running costs.



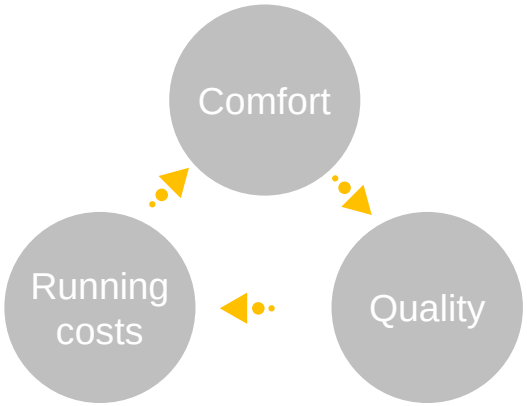


> “All of the running costs of a house … this is something that is done later. The builder doesn’t do this.

> “These are things (MINIMISING RUNNING COSTS) I can do after my home is built, also I live carefully, cover my floors with rugs so my running costs are not high.

Comfort … Quality … Running cost.

Comfort and quality were not at all associated with sustainability features in the minds of participants. Comfort is often associated with soft furnishings. Quality is about building features that you can see. It appears that participants viewed these features in parallel, rather than in an inter-related 'package' for a home.



> "Comfort is things like my sofas that I already own. I'll put them in when it's done. It's not to do with the quality of my builder.

- Participants' attention was drawn to three specific elements of the sorting exercise: comfort, quality and running costs.
- They were then asked whether they could see a relationship between the three (for example, quality insulation leads to a more comfortable temperature and reduced running costs.
- Few, if any participants could easily explain how these three features related to each other, or could interact to lead to home that is both efficient and comfortable.
  - 'Comfort' was typically associated with soft furnishings and features added after the build.
  - 'Quality' is most closely related to features you can see – skirting, exterior finishes etc. – not invisible features such as insulation.
- These considerations were generally characterised in parallel with each other – individual decisions about a home that are made in isolation of each other depending on preference for each.
- While Sustainability Victoria may be thinking in a more wholistic way about how sustainability features can work together, it is likely that Volume Home buyers do not.

Appeal of specific ZNC features.

Awareness of sustainability features.

Knowledge of the existence of sustainability features is not a major barrier to purchase. Participants could easily name features off the top of their heads.

- When asked to name sustainability features without prompting, some participants could easily identify a very wide range of sustainability features.

Awareness of sustainability features in approximate order of recall.

Solar panels

Double-glazing

Water tanks (also described as grey water systems)

Solar hot water

Low energy lighting

Energy efficient lighting

Split system cooling

Shutters for windows

Insulation

Orientation of house

- Solar is by far the most top-of-mind sustainability feature for most participants.
- Double-glazing and water tanks are also well known.
- Far fewer participants identified good insulation and the orientation of a house as a sustainability feature.

Barriers and enablers of choosing sustainability features.

Participants struggled to explain barriers and enablers of choosing sustainability features in any detail. For most, solar water tanks etc. were simply not on the radar as they had never been put forward by anyone in the construction industry

Barriers

Few participants had actively engaged in concrete planning to purchase sustainability features such as solar, water tanks etc.

Those that had considered these features were put off by a perception that they were relatively expensive with minimal return (an assumption that was challenged as described on the next page).

The biggest barrier appears to be the builder. Sustainability features are generally not offered to this segment of the market.

The myriad of other choices and considerations required to build a Volume Home therefore eclipse consideration of sustainability features.

Enablers

The few participants who had purchased solar generally described financial benefits in terms of cost-saving on energy bills.

These participants tended to stay in their home for longer periods, including those who never intended to move again.

Further, these participants tended to be older and purchasing their second, third or fourth home, and therefore may be better informed of the benefits of these features.

Considerations such as 'adding value to the home' or 'minimising environmental impact' were virtually non-existent.

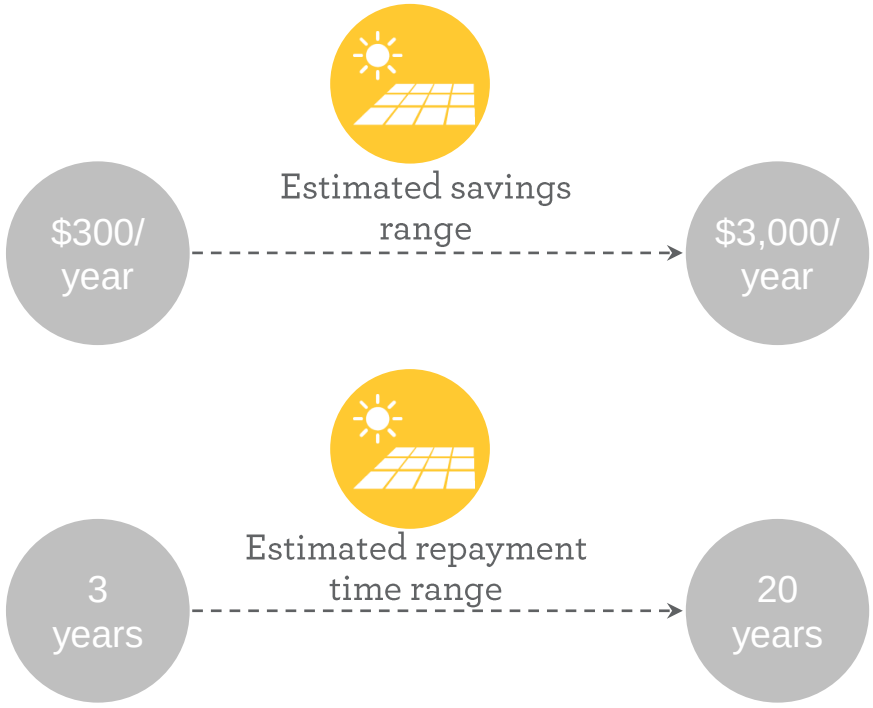
> "Yes, I looked into solar and that when I was looking online. But the builder never bought it up and gave me a million different things to think about. It just fell off the to-do list.

Understanding of the costs and benefits of solar.

Understanding of the costs and benefits of solar is generally either non-existent, or wildly inaccurate. Building knowledge of these sustainability factors will be important. Some participants were pleasantly surprised with lower-than-expected costs and greater-than expected benefits.

- Participants' attention was drawn specifically to solar panels.
- Without prompting, participants were asked about their understanding of the costs of solar panels to the value of $10,000 in terms of energy bill savings, and the length of time before the panels 'paid for themselves.
- Very few participants could provide an accurate estimate of these aspects of solar panels.
- Estimates varied greatly from very low savings on energy bills to very high; similarly, the timeframe for repayment ranged from very short to very long.

After this exercise, estimates provided by Sustainability Victoria of $1,200 savings /year with repayment over eight years came as a very pleasant surprise to some participants



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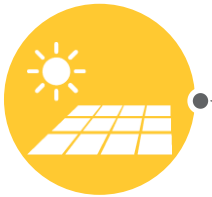
Measures to encourage uptake of solar.

Three concepts aimed at encouraging uptake of solar were tested with participants. Only the simplest, most direct incentive in the form of a rebate sparked any interest.



Incentivising solar uptake

Rebates or discounts on solar features.

This form of incentivisation had the most appeal for participants. It was the easiest to understand, being the most direct, and most immediate form of monetary incentive. Some participants were, however, cynical as they recalled recent reductions and/or removals of solar incentives from government.

Access to reduced rate mortgages.

Most participants were very cynical about this form of incentivisation. There was a common belief that banks would not offer this form of mortgage at all, or would somehow offset the cost in other ways leading to no real savings. Appealing to longer term savings over immediate gratification in the for of rebates was also less appealing.

Independent 'seal of approval'

This form of incentivisation confused some participants, who perceived that inspections and approvals were already in place from organisations such as HIA, or independent contractors paid for by the buyer. The appeal of this form of incentivisation was therefore minimal without further explanation of the value it might offer.

> "The banks would never go for it (reduced rate mortgages). Even if they did, they would find a way to sting you somewhere else.

Messaging.

Messages tested.

1

Invest in quality features like solar panels, double-glazing, efficient fixed appliances and good insulation for your new home. These are more affordable than ever, and will add value and enhance the quality of your property. Future buyers of your home will likely expect solar as a feature when you come to sell it.

2

Save money by investing in solar panels, double-glazing, efficient fixed appliances and good insulation for your new home. For example, a top-of-the line solar unit costs $10,000 and will save you $1,200 per year for a family household – about the same as rego and insurance for a car. This means they will pay for themselves in about eight years.

3

A quality home is an efficient home. Quality means low running costs because of reduced needs for heating and cooling. This means a comfortable home, cool in summer and warm in winter, to ensure your wellbeing. Invest in a quality home.

Positive Negative Mixed Unclear ??

General reactions to the messages are noted by

4

Our world is changing. Our climate is changing. The design of your home needs to change with it. Invest in features like solar panels, and good insulation for your new home. This will minimise your impact on the environment and make sure our children live in a clean, comfortable world.

5

More and more people are investing in solar panels, and good insulation when they design their new homes. Don't get left behind with an old-fashioned house that is inefficient to run.

- Five prototype messages were tested, based on themes of:
  1. Adding value to a home for future sale.
  2. Saving on running costs through sustainability features.
  3. Making an explicit link between quality and efficiency.
  4. Environmental responsibility.
  5. Keeping up with the Jones's.
- Some messages were designed to be deliberately provocative to test why some forms of messaging *do not* appeal as well as why other messaging does appeal.

Adding value to a home for future sale.

1

Invest in quality features like solar panels, double-glazing, efficient fixed appliances and good insulation for your new home. These are more affordable than ever, and will add value and enhance the quality of your property. Future buyers of your home will likely expect solar as a feature when you come to sell it.

For more information about how you can add value to your investment, click here or ask your builder.

Overall, this message resonated with some participants, though the notion of 'adding value to the home' was not seen to believable or of relevance to others.

- Most participants reacted positively to the linking of 'quality' to specific features such as double glazing and efficient appliances – as has been shown throughout this research, 'quality is paramount to many Volume Home buyers.
- Some participants were not certain about the added benefits of some of these 'quality features' – for example, a lack of appreciation of good vs. poor insulation.
- Even though the message is framed in the positive – statements around features being 'affordable' made some participants feel that the message was making them spend more money.
- 'Adding value' and the 'expectations of future buyers' appealed to some participants, but not others. Some participants saw that these features did add value and had actively thought about future sale. Others did not perceive that these features added value and were building their house 'for them' – not others.

> "What do you mean by good insulation, why is what comes as standard not good enough?

> "I don't like the phrase future buyers, I'm not building my home for them.

Positive Negative Mixed Unclear

Saving on running costs through sustainability features.

2

Save money by investing in solar panels, double-glazing, efficient fixed appliances and good insulation for your new home.
For example, a top-of-the line solar unit costs $10,000 and will save you $1,200 per year for a family household – about the same as rego and insurance for a car. This means they will pay for themselves in about eight years.

Also, insulation can reduce your heating and cooling bills.
For more information about how you can add start saving money with these features, click here or ask your builder.

This message was probably the most effective as it appealed to participants' financial needs and gives concrete examples.

- This message tested best of the five and should be given primary consideration for further development.
- The opening statement about saving money immediately resonates with participants from the very price-conscious market of Volume Home buyers.
- The concrete examples of costs and savings were also greatly appreciated – as noted previously, participants were largely unaware of specific details of these costs, savings and timeframes.
- The specific comparison to known costs such as car registration/insurance did not resonate well. Some participants felt that this approach was too personal, sounded like a sales-pitch and was possibly inaccurate.
- While providing an 'anchor point' was thought to be a good idea in the design of the message, it is unlikely to be effective in the market.

> "Its good … up until you start telling me about the rego on my car. It's too 'salsey'. Also, how do you know what my insurance is?

> "Well, this is just common sense. Why wouldn't you save on costs?

Positive Negative Mixed Unclear

Making an explicit link between quality and efficiency.

3

A quality home is an efficient home. Quality means low running costs because of reduced needs for heating and cooling. This means a comfortable home, cool in summer and warm in winter, to ensure your wellbeing. Invest in a quality home.

For more information about how you enhance the quality of your home with these features, click here or ask your builder.

The overall tone of this message missed the marked in that it sounded like a sales pitch and lacked evidence

- The intent of this message was to directly link 'quality' to 'efficiency' and 'running costs'.
- However, the message did not succeed in this regard.
  - It was thought to lack specificity such as naming features that participants could relate to – insulation, double glazing etc
  - It lacks clear explanation of benefits such as cost savings (shown in previous message)
  - The tone was thought to sound too much like a sales pitch from a builder or real estate agent, something that is off-putting to participants who were often 'sales fatigued'.
- Based on this, any messaging from Sustainability requires specificity, evidence of benefits and cannot sound like a sales-pitch.

> Well I'm lost. It's all too vague. And it sounds like a sales pitch. It can't sound like a sales pitch, we've had enough of them. Even when it's a sales pitch, is still does not show me benefits.

Positive Negative Mixed Unclear

Environmental responsibility.

4

Our world is changing. Our climate is changing. The design of your home needs to change with it. Invest in features like solar panels, and good insulation for your new home. This will minimise your impact on the environment and make sure our children live in a clean, comfortable world.

For more information about how you can reduce your impact on the environment, click here or ask your builder.

As was evidenced in the builder interviews and buyer survey, appealing to a sense of environmental responsibility does not work with Volume Home buyers.

- It was already known from previous stages of the research that appeals to 'environmental responsibility' are ineffective for Volume Home buyers.
- Nonetheless, an environmentally based message was included in testing to explore *why.*
- The reasons for lack of resonance are likely three-fold:
  1. It is at odds with the sense of control that is a primary driver of opting for a Volume Home – telling a buyer what they should do to be 'a good person'
  2. Relatedly, participants resented an perceived sense of guilt that the message suggests – an implied responsibility for caring for both planet earth and the next generation.
  3. There is little causal link made between the design of a single home and broader environmental issues; climate change is 'tomorrow's problem' that is happening elsewhere.

> Nope. Just nope. We have enough problems affording and building our houses. This just sounds preachy.

> Don't *you* make *me* feel guilty. Just because I haven't bought your solar tanks or whatever you are trying to sell me.

Positive Negative Mixed Unclear

Keeping up with the Joneses.

5

More and more people are investing in solar panels, and good insulation when they design their new homes.

Don't get left behind with an old-fashioned house that is inefficient to run.

Don't miss out. For more information about how you too can benefit from these features, click here or ask your builder.

This message failed to resonate for similar reasons to messaging around 'environmental responsibility' – use of guilt or a feeling of obligation are not effective motivators to encourage sustainable features.

- Almost every aspect of this message was unappealing for most if not all participants (it was known to be a contentious message at the time of design).
- The lack of appeal was similar to the 'environmental responsibility' message – participants disliked being made to feel guilty, obliged, or to have control of choice dictated by factor other than their own decisions.
- Further, any suggestion that their 'dream home' may be considered less than perfect (old-fashioned, inefficient) was quite an affront to some participants.
- Future messaging should avoid any suggestion of the shortcoming of a home at all costs – emphasis benefits instead.

> "This is just an insult. It's scare tactics."

> "Well, this has to be the worst of all of them so far. It makes me feel guilty *and* tells me that my house is old-fashioned and inefficient. Thanks."

Positive Negative Mixed Unclear

Presentation of ZNC concept.

Platinum and Gold Sustainability features.

Platinum

The package costs $15,000 and can be added to a new build. It includes:

High performance design specifications such as double glazing, extra insulation, energy efficient design features. – Features that could add up to $13,000.

Energy-efficient appliances and systems such as hot water systems, and an air conditioner. Features that could add up to $3,500.

On-site renewable energy generation using a solar system and potentially battery. – A value of about $10,000.

'As built verification' a guarantee that the original design is delivered, and the quality of the build is verified.

Gold

The package costs $8,000 and can be added to a new build. It includes:

High performance design specifications such as double glazing, extra insulation, energy efficient design features. – Features that could add up to $13,000.

Energy-efficient appliances and systems such as hot water systems, and an air conditioner. Features that could add up to $3,500.

'As built verification' a guarantee that the original design is delivered, and the quality of the build is verified.

- Sustainability Victoria is planning a packaged product of sustainability features that can be offered to Volume Home buyers.
- Two options at two different price points were tested, described above.

Reactions to the Platinum Package.

The package costs $15,000 and can be added to a new build. It includes:

High performance design specifications such as double glazing, extra insulation, energy efficient design features. – Features that could add up to $13,000.

Energy-efficient appliances and systems such as hot water systems, and an air conditioner. Features that could add up to $3,500.

On-site renewable energy generation using a solar system and potentially battery. – A value of about $10,000.

'As built verification' a guarantee that the original design is delivered, and the quality of the build is verified.

- Reactions to the Platinum Package varied greatly from participant to participant.
- Some described these features at this price point as a 'no brainer' – something that would be taken up immediately if offered by a builder.
- At the other end of the spectrum, others would not consider the package at all due to cost or scepticism that the sustainability features would deliver as promised.
- This wide range of reaction appeared to be most associated with:
  - Plans for length of occupancy – those planning to stay in their home for the longer term seemed far more receptive to the package
  - Budget – participants who appeared to have at least some additional funds were more open to the additional expenditure
  - "Existing knowledge and openness to sustainability features – participants who expressed at least some interest in solar and other features earlier in the group were interested, largely due to the pricing of the package.

> "This is a no-brainer. No one offered me this, not this cheap. I would have taken it up straight away.

> "Not on my budget, no. There is no way I just have another fifteen-K to spend, even if it does save you in eight years.

Reactions to the Platinum Package.

The package costs $15,000 and can be added to a new build. It includes:

High performance design specifications such as double glazing, extra insulation, energy efficient design features. – Features that could add up to $13,000.

Energy-efficient appliances and systems such as hot water systems, and an air conditioner. Features that could add up to $3,500.

On-site renewable energy generation using a solar system and potentially battery. – A value of about $10,000.

'As built verification' a guarantee that the original design is delivered, and the quality of the build is verified.

- The total cost of $15,000 was appealing for participants with available budget, particularly given the sum of the values of the components of the package (the cost of the solar component etc).
- However, some expressed cynicism that these value statements were 'too good to be true'.
- Generalist terms such as 'high performance design specification' and 'energy efficient 'energy efficient design features' frustrated participants due to their lack of specificity.
- The inclusion of solar and particularly the battery was the most appealing and desirable feature for participants. These features were the best known to participants and were known to be high value. The fact that the concept stated that the package 'possibly' included a battery was a deal-breaker for some participants.
- 'As built verification held little meaning for most participants and will require further explanation if it is to be included in messaging.
- Some participants expressed frustration that the package was too prescriptive and would prefer to make their own choices.

> It sounds like a sales pitch, I wouldn't believe it.

> Can I pick and choose?

Positive Negative Mixed Unclear

Reactions to the Gold Package.

The package costs $8,000 and can be added to a new build. It includes:

High performance design specifications such as double glazing, extra insulation, energy efficient design features. – Features that could add up to $13,000.

Energy-efficient appliances and systems such as hot water systems, and an air conditioner. Features that could add up to $3,500.

<SOLAR COMPONENT REMOVED>

'As built verification' a guarantee that the original design is delivered, and the quality of the build is verified.

- The Gold option was tested briefly to gauge interest in lower cost options.
- The reduced price-point registered little interest for those participants who had already balked at the $15,000 price point – it was still too much additional money in their opinion.
- The removal of the solar panels and particularly the battery to attain this price point was off-putting to participants who were initially interested in the Platinum Package.
- Solar plus battery appears to be the most appealing and easy-to-understand component of the packages and therefore should be retailed for maximum appeal.

> "You took my solar and my batteries out? No. Not interested any more.

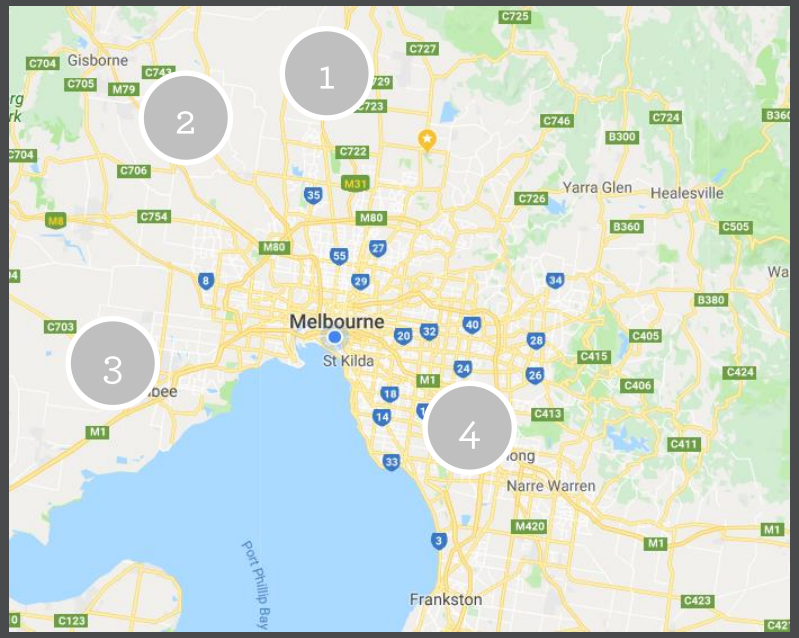
- Participants were asked whether they would sacrifice other components of their home design to accommodate either the Platinum or the Gold Packages.
- Some simply said 'no' and did not see value in the package that would be worth a trade-off.
- Some participants were willing to make some sacrifices, though only very minor ones. For example, size of house, number of rooms would not be traded. However, minor fittings such as bench-tops and soft-furnishings might. Features that could be retro-fitted later when the money was available were more likely to be identified as potential trade-offs.

Positive Negative Mixed Unclear

3: Survey of potential and past Volume Home buyers.

Survey Methodology.

- n=108 potential volume home and n=108 past volume home buyers were surveyed.
- The survey used a mix of telephone, intercept and online interviewing.
- Volume home buyers were targeted in four key growth corridors with a growing number of volume homes:
  1. The outer-north of Melbourne
  2. Sunbury and Digger's Rest
  3. The outer west of Melbourne
  4. Outer south-east Melbourne
- Key lines of questioning related to:
  - The buying process such as choice of builder, budget, type of home and house/land package options
  - Types of research undertaken in the decision-making process
  - Drivers of choice of home design
  - Affinity to choose environmental features of a build.
- Analyses in this report are provided separately for potential and past volume home buyers as these are two different markets, with some notable differences in their attitudes and behaviours



colmar brunton.

Key findings from the survey.

1. Quality and internal design/layout are the primary consideration of buyers when they are making decisions. Specific environmental or sustainable features are low on the consideration set for most buyers.

2. However, there appears to be an emerging interest in considering environmental features amongst potential buyers. Consideration of cheaper environmental features (lighting) is greater than consideration of larger investments (solar).

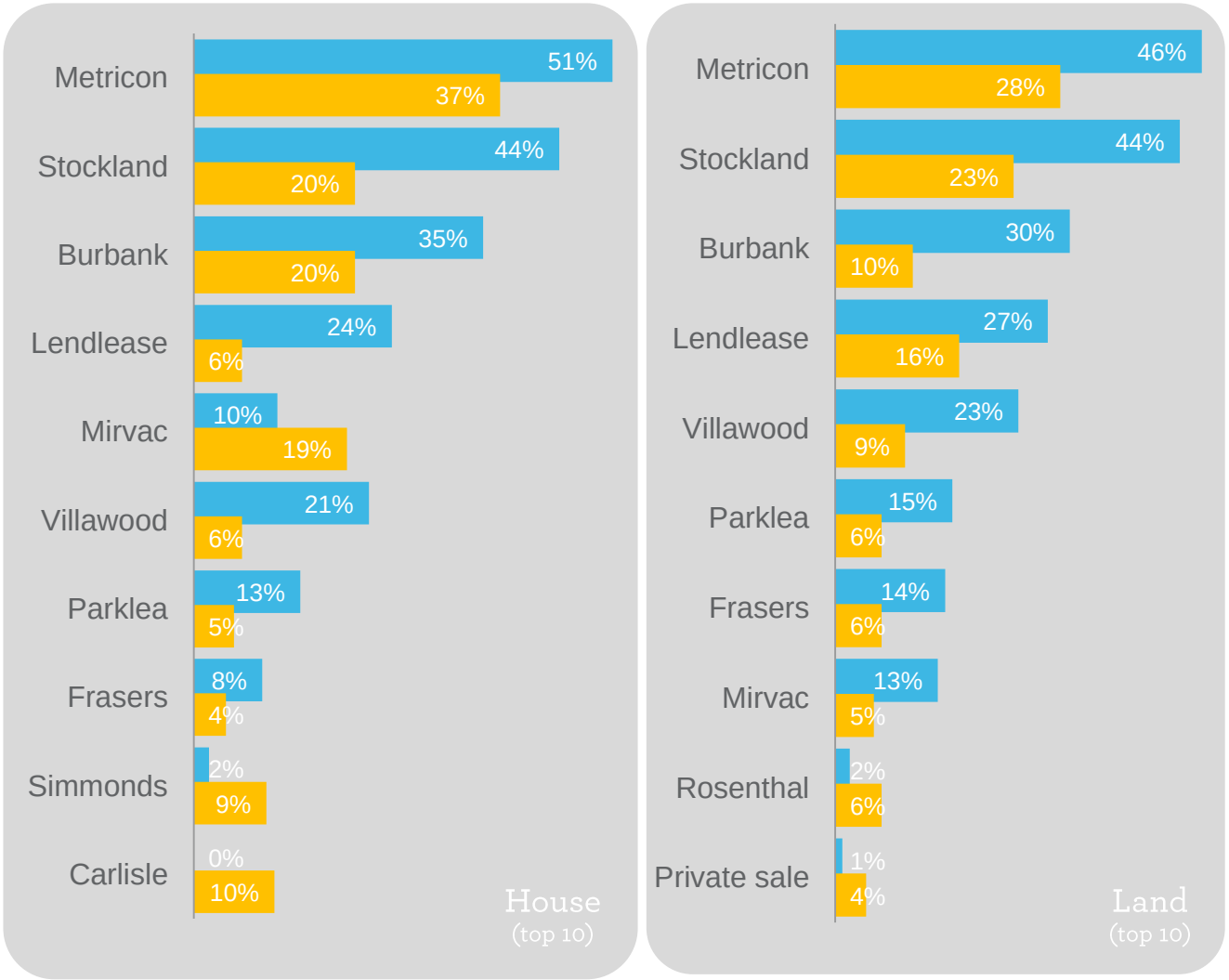
3. However, intention does not necessarily match with actions of past home buyers who rarely invest in these features. A means to harness these good intentions and turn them into action needs to be developed.

4. Today, buyers are spending longer on researching their homes than in past years. Sustainability Victoria has approximately one year to reach most buyers.

5. Sustainability Victoria can reach them at display villages in the first instance. Online research is also very common. Magazines are not often used as sources of information.

Purchase pathway.

House and land providers – considered and used.



Metricon and Stockland dominate both market-share and mind-share.

- Potential volume home buyers were asked which house/land providers they were considering; past home buyers were asked which provider/s the used when they built their house.
- The larger providers, Metricon and Stockland, were the most popular choices for both house and land purchases.
- Potential home buyers tend to be considering a range of house/land providers.

Q4. And which companies [are you considering to buy your new/did you considering buying your most recent] home with? Q5. And which companies [are you considering to buy your new/did you considering buying your most recent] home with?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

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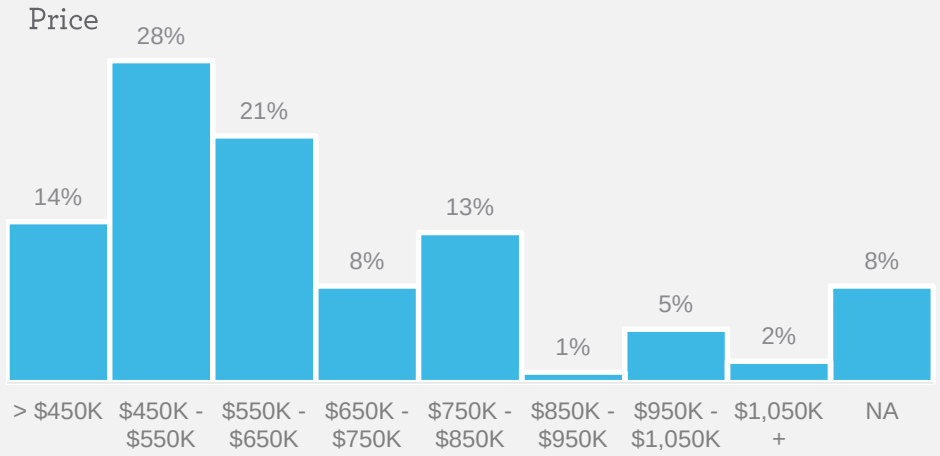
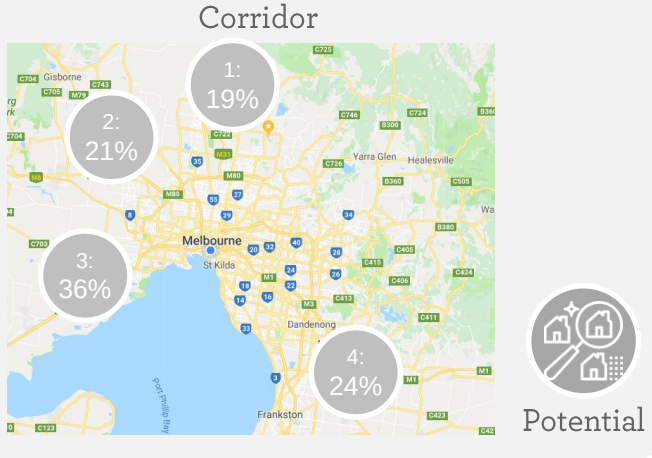
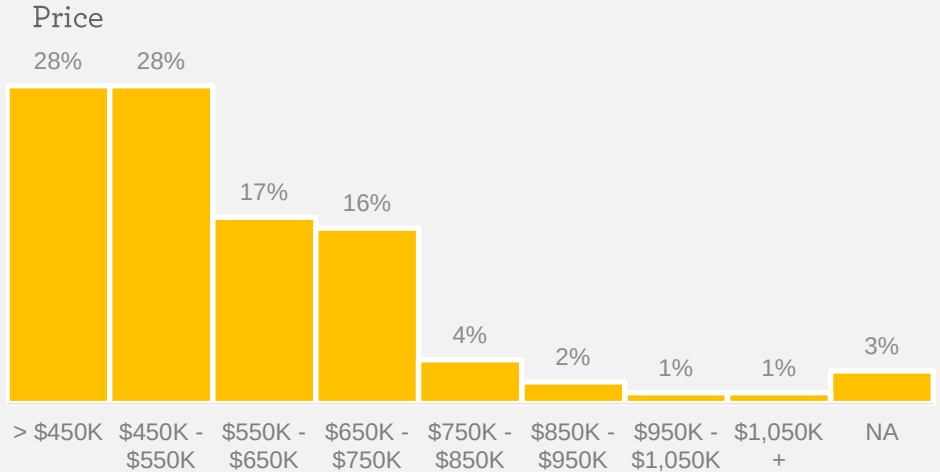
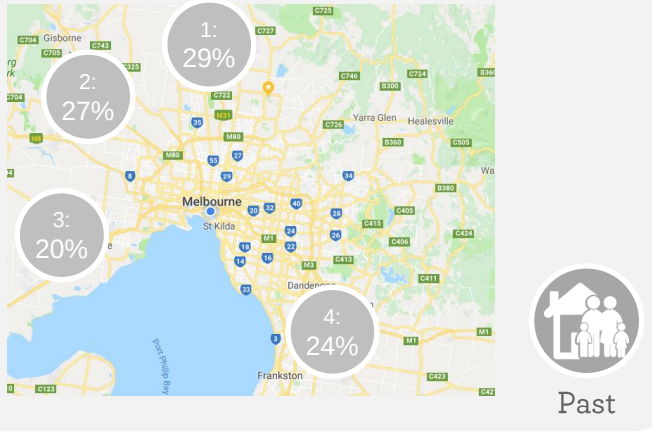
Price and location.

Past volume home buyers spent less on their homes than potential buyers intend to spend on a home in the future.









- Past volume home buyers tended to have spent less on their home compared to what potential buyers intend to spend.
- This is likely the product of a housing market that has been increasing in value.
- The sample was relatively evenly distributed across the four growth corridors.
- Most past buyers managed to keep to their budget (74%) though some exceeded their intended budget (26%).

Corridors

1: Northern

2: Sunbury/Digger's Rest

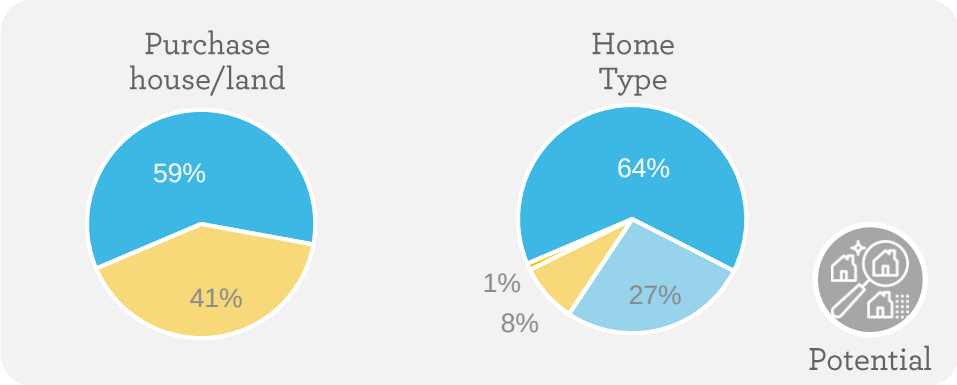
3: Western

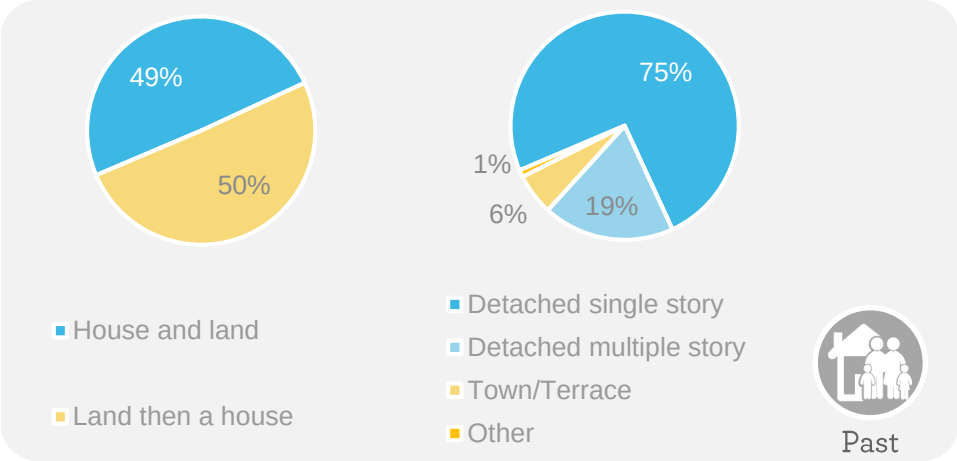
4: South Eastern

Q15. Approximately how much are you planning to spend on your new home including land/Approximately how much did you spend on your most recent home including land? Q3B. And approximately where in Melbourne [do you plan to build/did you build] your new home?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

Type of home purchase.

Preferences for home type and land/house purchasing arrangements were similar for past and potential volume home buyers.



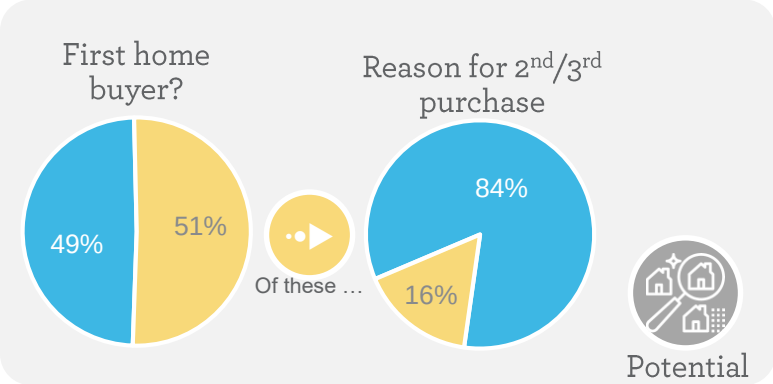


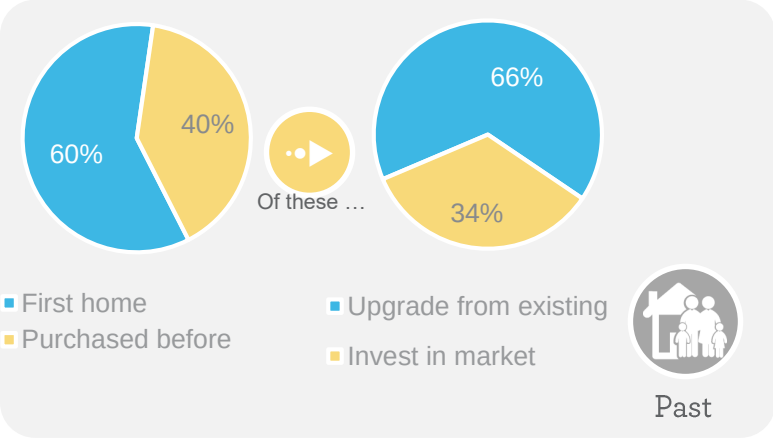
- Both past and potential volume home buyers were evenly split between purchasing house plus land; vs. land then house.
- Both past and potential buyers typically purchased (or intended to purchase) detached single storey homes.
- Multi-storey dwellings were less common.

Q6. And how [do you intend to/how did you] buy your house and land, [will/did] you? Q10. What type of home [are you planning to/did you] build?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

Number of home purchases and occupancy intentions.

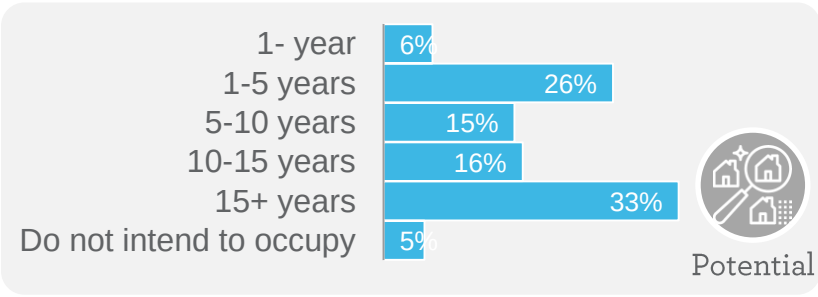
Potential volume home buyers generally fall into one of two camps – a very long-term occupancy or a relatively short occupancy.

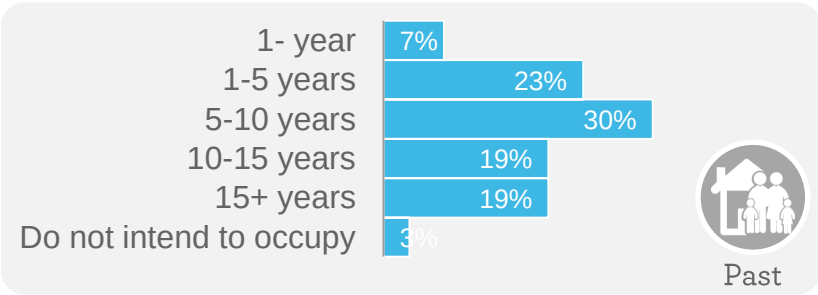




- Past and potential volume home buyers were relatively evenly split between being first home buyers vs. second/third home buyers.
- Most of these second/third buyers were upgrading from their existing home – fewer were investing in the property.

- Potential volume home buyers most commonly intended to stay in their new home for the longer term – 15+ years, though a notable proportion had shorter-term plans of 1-5 years.
- Past buyers typically intended to occupy the home for either 1-5 or 5-10 years





Q12 - And [will this be/was this] the first home you have purchased? Q13 - And why are you purchasing this home?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)
Potential home buyers second/third home (n=55); Past home buyers, second/third home (n=41)

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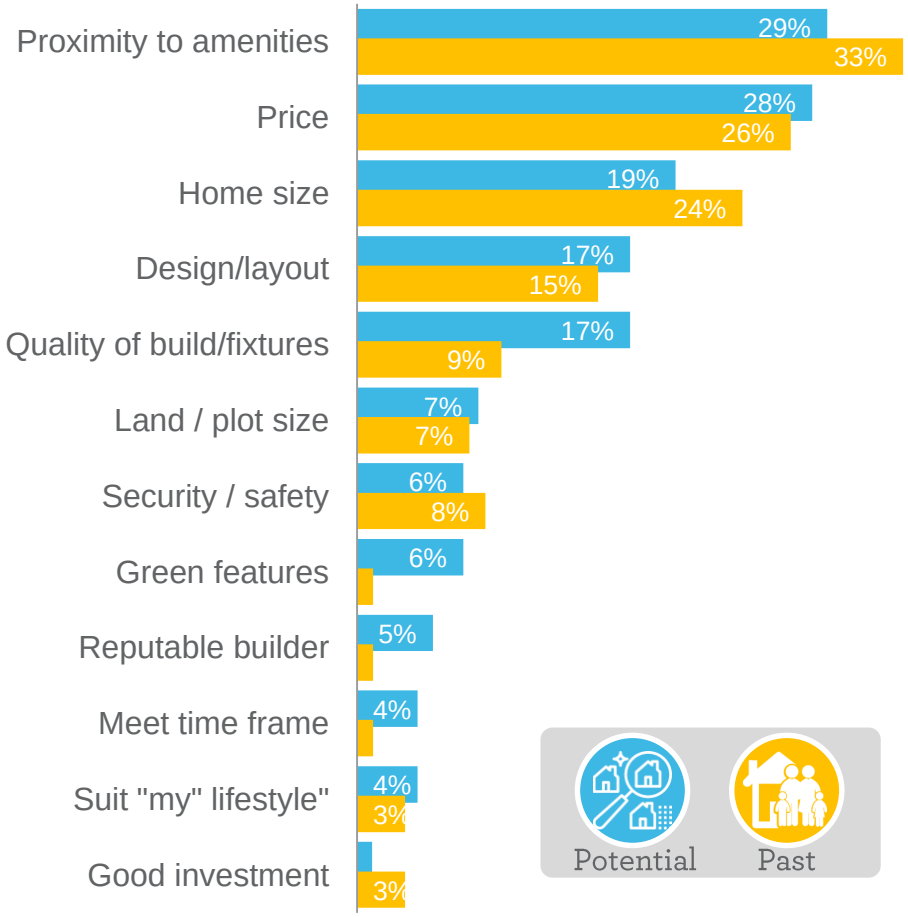
Purchase consideration set.

In buyers' own words: Key considerations.

Location and price are primary considerations. Sustainability features are rarely a consideration.



- The location of a home in terms of being close to desired amenities is the biggest driver of choice for both potential and past home buyers, closely followed by price and size (unprompted).
- 'Green features' rarely feature as a driver of home choice for any buyer.
- Sustainability features are often described alongside aspects of 'quality.

> Price. Location. Value. Proximity to shopping and infrastructure.

> Size, number of bedrooms and bathrooms, location, kitchen finishes.

> Energy star rating of the house - design of the house and facade - quality of craftsmanship - size of the house - appliance quality - solar panels and water tanks.

Q17. In as much detail as possible please tell me what [are the most important considerations as you plan/were the most important considerations when you were planning] your new home?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

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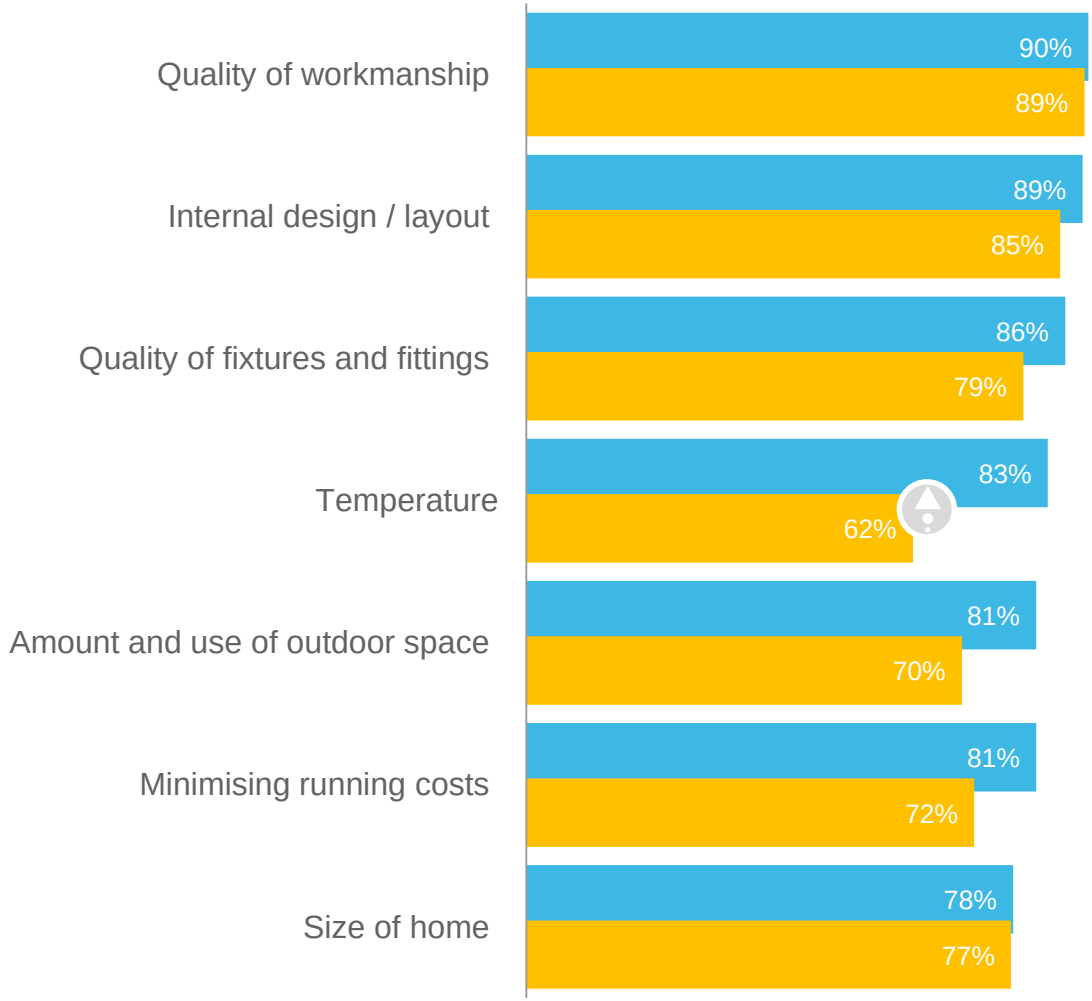
Important design considerations.



Potential and past volume home buyers are most concerned with ‘quality’ over less tangible benefits such as reducing running costs.

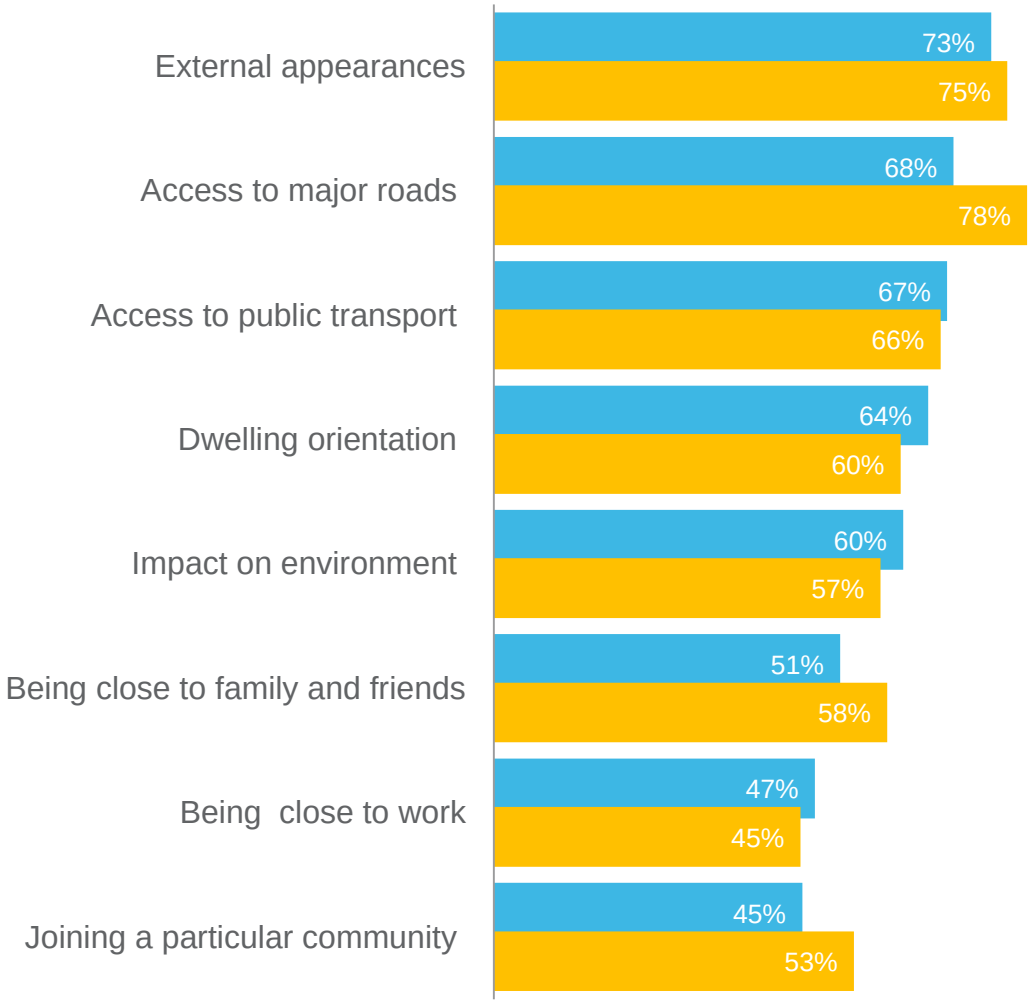
- Both potential and past Volume Home Buyers value quality workmanship and the layout of a new home above all other considerations (prompted).
- This primary concern over quality also extends to fixtures and fittings.
- Potential buyers perceive that temperature control is of greater importance for the home they intend to buy; compared with the considerations of past home buyers.
- Reducing running costs of a home is considered less important than tangible perceptions of quality.

Potential Past

Shows sum of ‘important’ (7-10)

Q18. On a scale of 0 to 10 where 0 is extremely unimportant and 10 is extremely important, how important [are the following factors to you personally as you are planning your/were the following factors to you personally when you were planning your most recent] new home?.
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

Important design considerations (continued).



Less important considerations for new homes tended to focus on infrastructure such as roads and transport – impact on environment was generally quite low in buyers' consideration set.

- Potential and past volume home buyers tender to place less importance on geographic considerations such as:
  - Access to major roads and public transport (which may have limited availability in the growth corridors of interest)
  - Proximity to family and work
  - Being part of a particular community.
- Environmental impact was not a primary consideration.
- Despite an interest in temperature control for potential buyers, fewer considered the orientation of their planned new house suggesting a disconnect between aspect and internal climate.

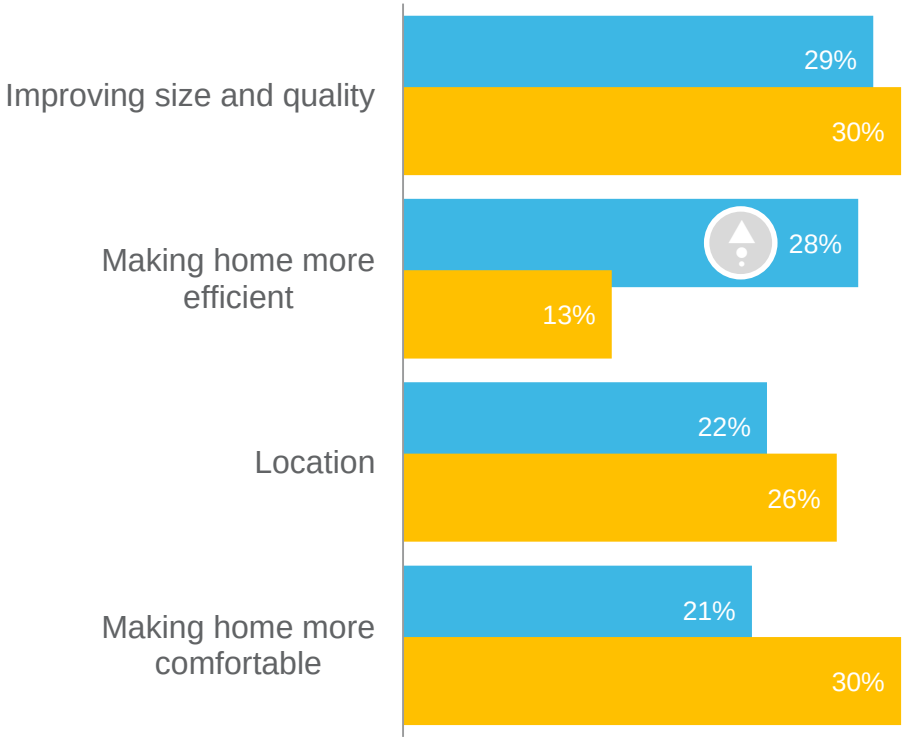
Potential Past

Shows sum of 'important' (7-10)

Q18. On a scale of 0 to 10 where 0 is extremely unimportant and 10 is extremely important, how important [are the following factors to you personally as you are planning your/were the following factors to you personally when you were planning your most recent] new home?.
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

+ $50K If you had an additional $50,000...

Potential volume home buyers are more likely to dedicate additional funds to improving the efficiency of a house compared with past buyers.

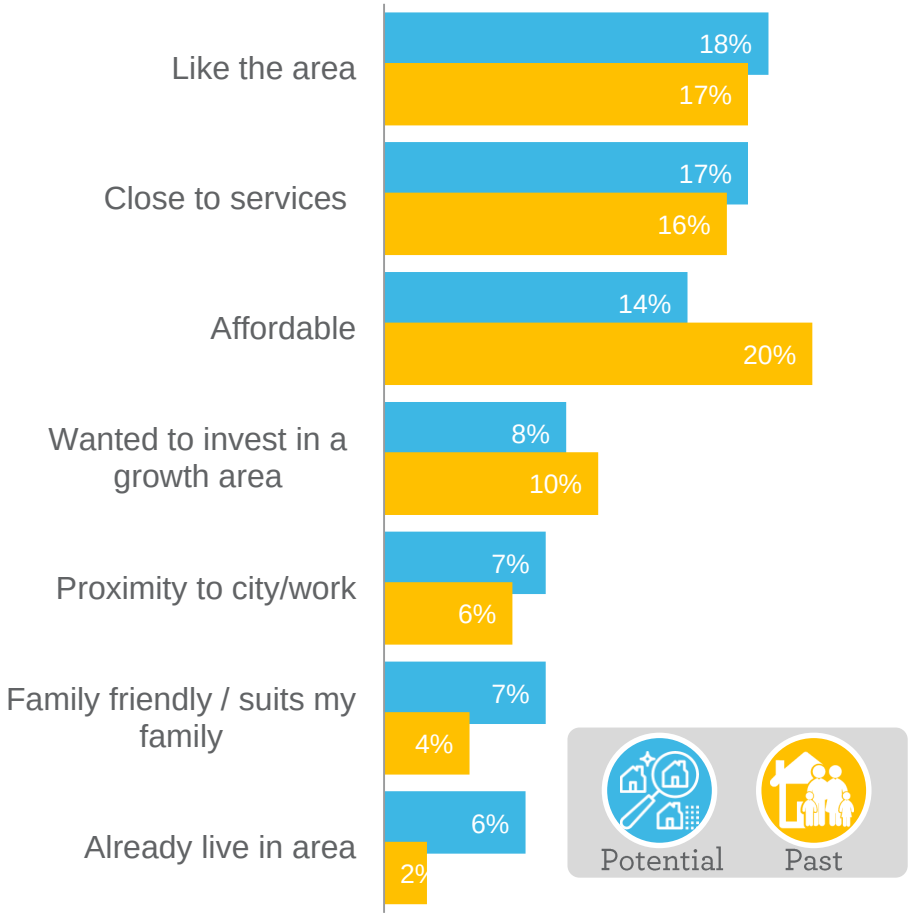


- All volume home buyers were asked what they would do with an additional $50,000 to attain their 'ideal home'.
- The most common response related to improving size and/or quality of the home for both potential and past buyers.
- Potential volume home buyers also desired a home that is more efficient to run – a greater proportion of potential buyers would allocate additional funds to efficiency than past buyers.
- Equal proportions of potential and past buyers would spend the additional money on an enhanced location, or increasing the comfort of their home.

Q19. You mentioned your budget was [RESPONSE AT Q15], now imagine you had an additional $50,000 to spend on designing your ideal home. From this list choose one aspect of your home that you would spend this money on?
Base: Potential Home Buyers (n=108)

Reasons for choice of location.

A general liking of selected areas and proximity to amenities are the primary drivers of choice of location



- The primary motivators for both potential and past home buyers is a simple liking of the area for their home, and the proximity of the home/planned home to services.
- Proximity to friends and family and places of work were lesser considerations.

> We are planning to build out in the Drouin area in Victoria we like the rural feel of this area.

> In Wallan, it was chosen due to growth factors and the ability to fill it with renters, also a new location in closeness to various facilities.

> I want to build because its much cheaper in the long run and I can renovate my home whenever.

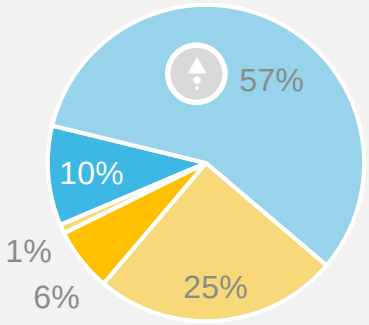
Q9. In as much detail as possible, can you tell me where you [are planning to build/most recently built] and why?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

Research strategies.

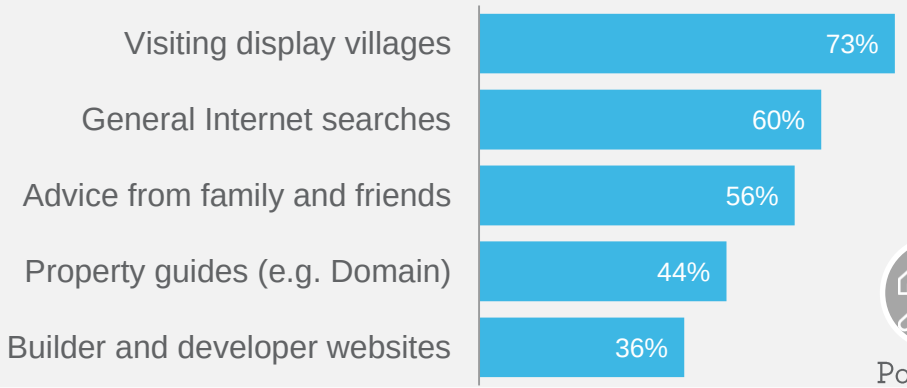
Research time and strategies.

Potential volume home buyers are spending longer to research their home than past buyers – display villages are the most common source of information for both types of buyer.

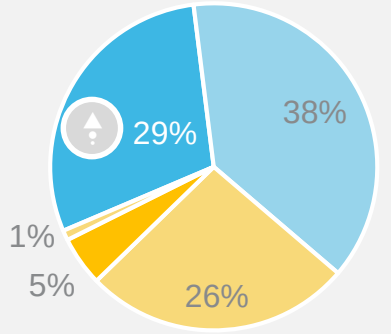
Time spent

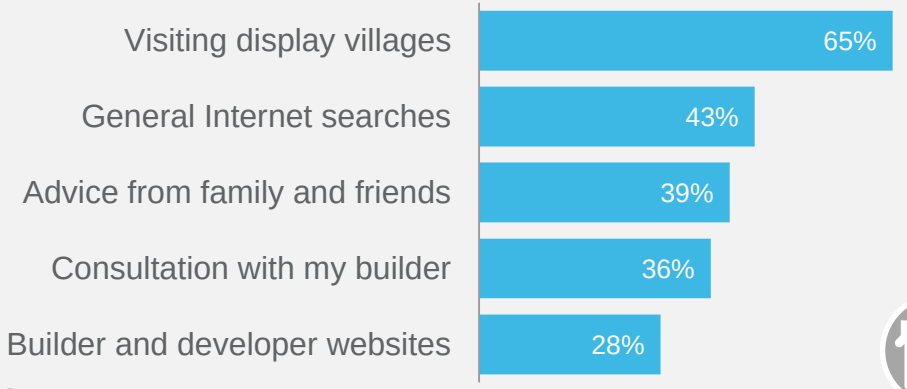


Search strategy (top 5)



Potential





Past

- Potential volume home buyers tend to spend slightly longer researching their purchase than past buyers – a greater proportion invested up to a year of research as opposed to six months.
- Both types of buyer tend to focus their searching in the same places:
  - Display villages
  - General internet searching
  - Advice from family and friends.
- Hardcopy materials such as magazines were rarely used (not charted in top 5).

Q21. How long [do you intend to/did you] spend researching the [home you are planning to build/the most recent home you have built? Q22. Which information channels [have you used while planning to/did you use while planning your most recent] build?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

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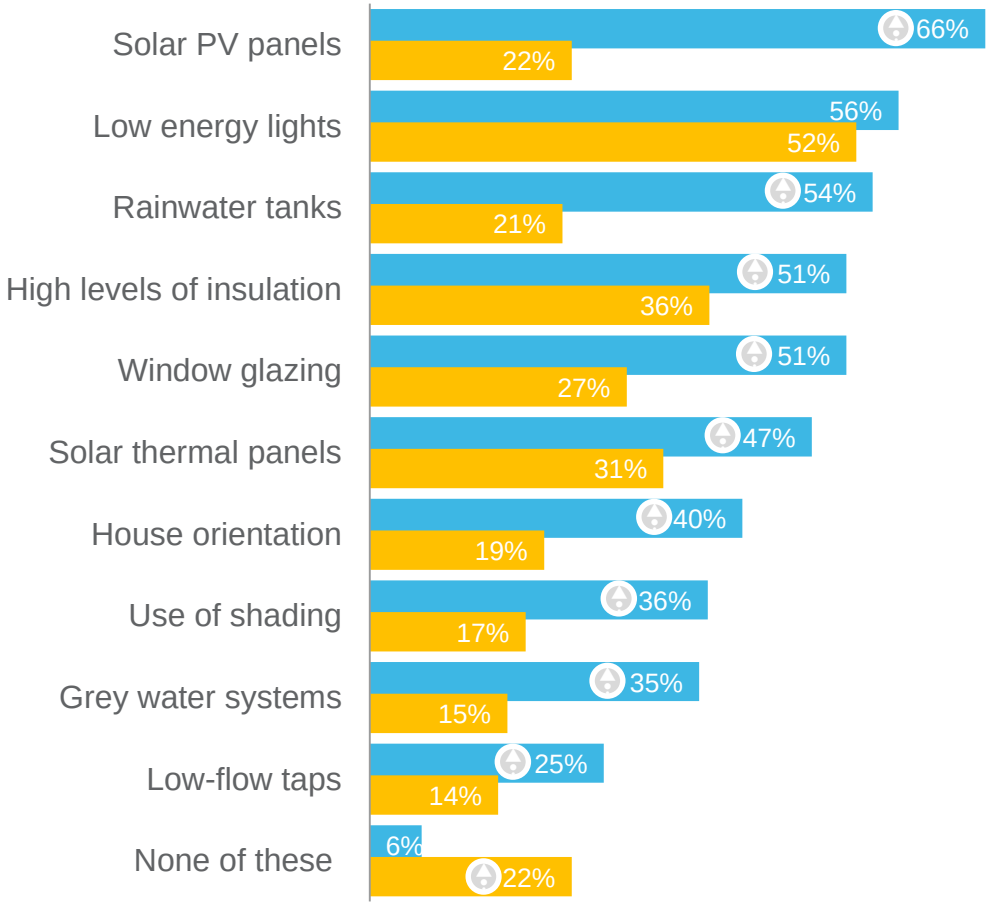
Consideration of environmental features.

Building and intending to build environmental features.

Consideration of environmental features such as solar is high amongst potential volume home buyers – far higher than actual building by past buyers.



- Consideration of environmental features of homes is generally far higher for potential volume home buyers compared with past buyers:
  - Two thirds of potential buyers are considering the instillation of Solar PV panels – a far higher proportion compared with the proportion of past buyers who added these features
  - Similarly, a greater proportion of potential buyers are considering the installation of rainwater tanks for their new homes.
- About half of both potential and past buyers are considering the installation of low-energy lighting (a far cheaper proposition than solar panels or rainwater tanks).
- Grey water systems and low-flow taps were amongst the least considered features and are perhaps unfamiliar to buyers.

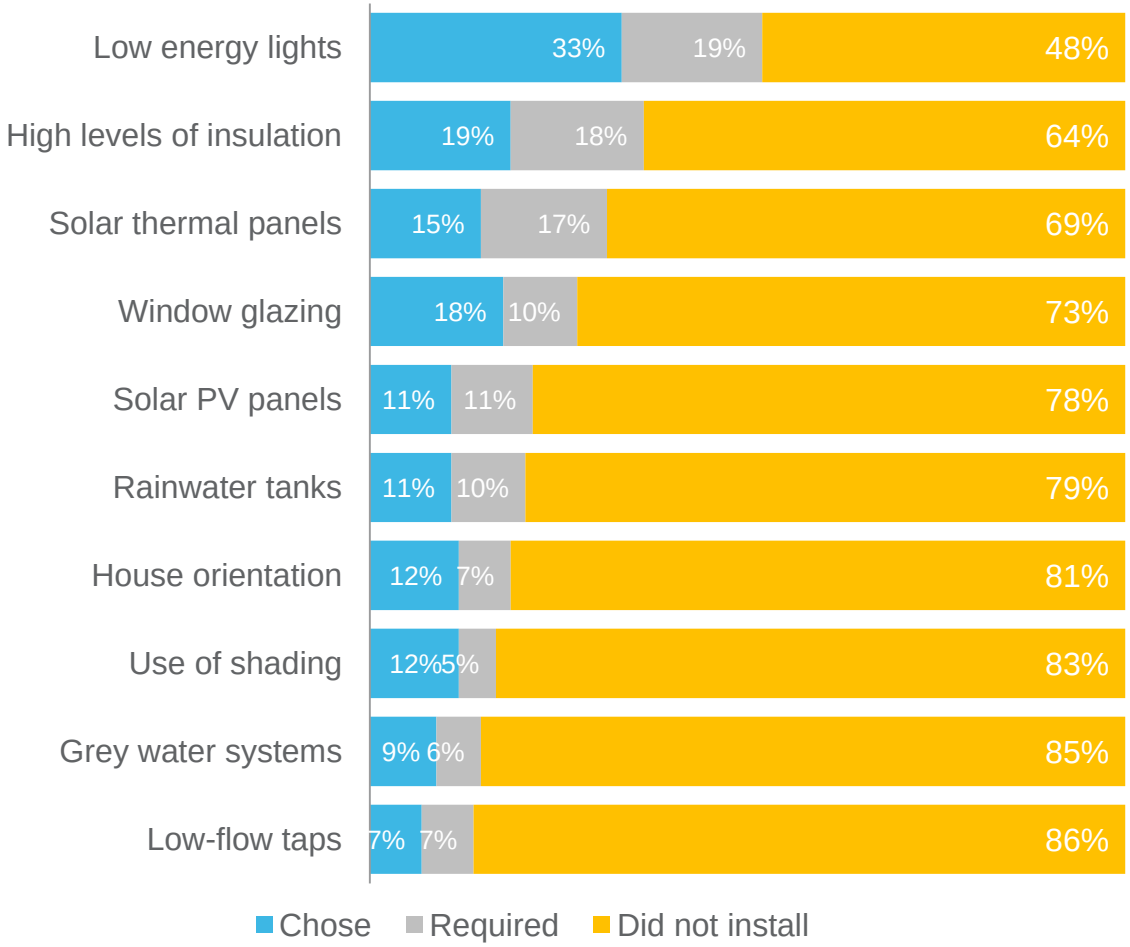
Potential (Intending) Past (Built)

Q27. [Are you intending to install or build any of these features into your/And did you add on or build any of these features on your most recent] home?
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

colmar brunton.

Past buyers only – feature choice vs. requirement.

Cheaper features such as low energy lighting is chosen as an option with relative frequency –more expensive options such as Solar PV panels are not.



- Past volume home buyers who stated that these environmental features were present in their house were asked if the feature was a requirement of the design, or whether they had selected them as an extra in the design process.
- Whether a feature was a requirement or selected varied greatly, possibly as a function of price.
  - For example, the relatively inexpensive option of low energy lighting was commonly selected by buyers, rather than coming as standard
  - More expensive solar PV panels and water tanks were less frequently selected and were also less frequently a requirement of the build.
- Window glazing was a feature that stood out as being something that was relatively frequently selected, even though it was not a requirement.

Q28. And did you choose to add these features or were they required by the builder?
Base: Past home buyers who had features built/installed. Range (n=14 to n=58)

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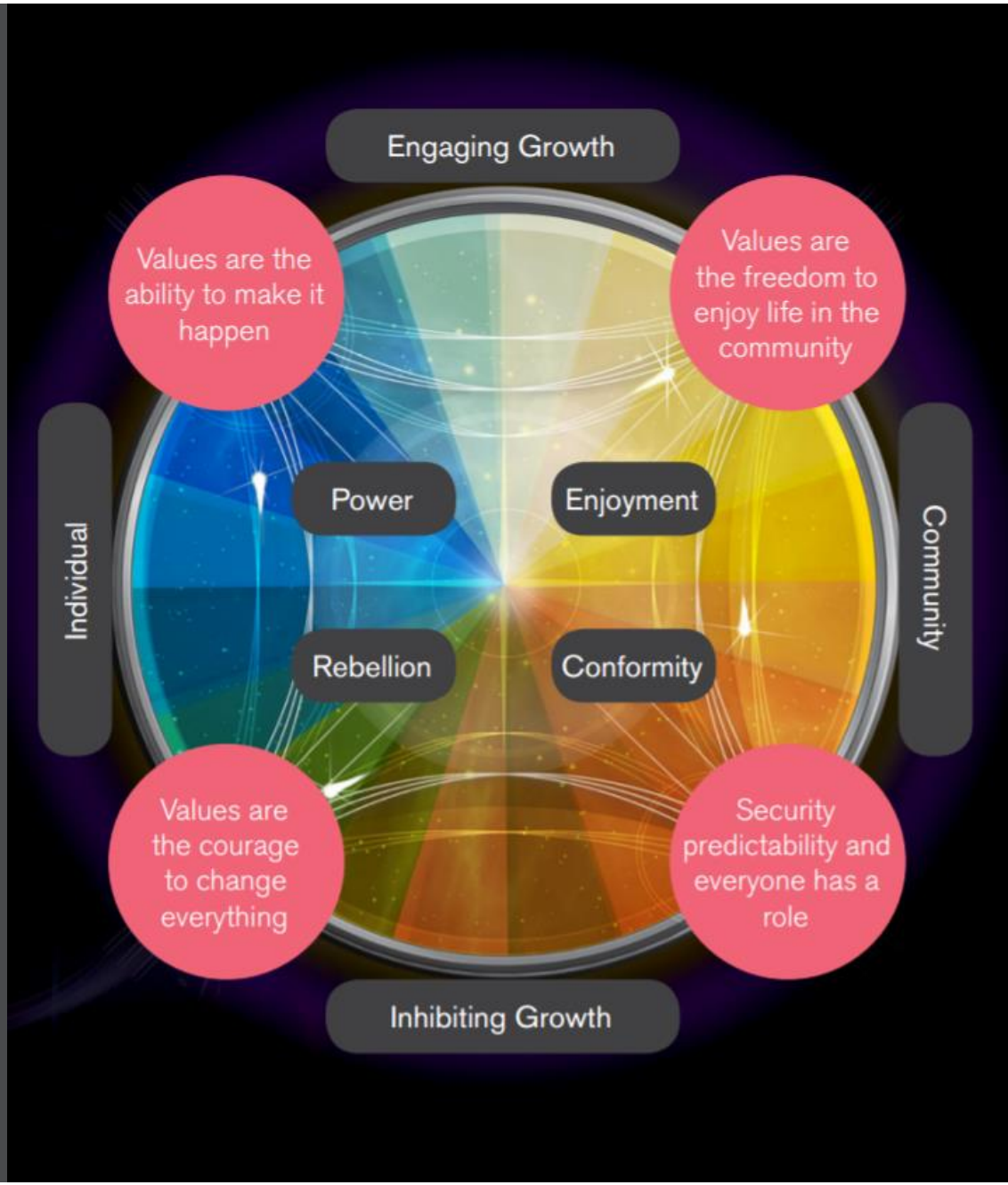
Position within Millennium Monitor.

What is the Millennium Monitor?

The Colmar Brunton Millennium Monitor is a unique Australian monitor of societal trends that can help you see the future. Rather than most other social trackers which tell us what has just happened, the Millennium Monitor focuses on what is about to happen. And knowing what is about to happen gives you an extreme power. It literally unlocks the future.

Born in 1999, the Millennium Monitor explores the pattern of change in social values, attitudes and behaviours over the long term, and the implications of these changes. We have found that societal values shifts in cyclical eras. Knowing which era we are in and where we are headed enables us to reflect the emerging values and moods of society.

The Millennium Monitor can be applied to marketing communications, innovation, and behaviour change.



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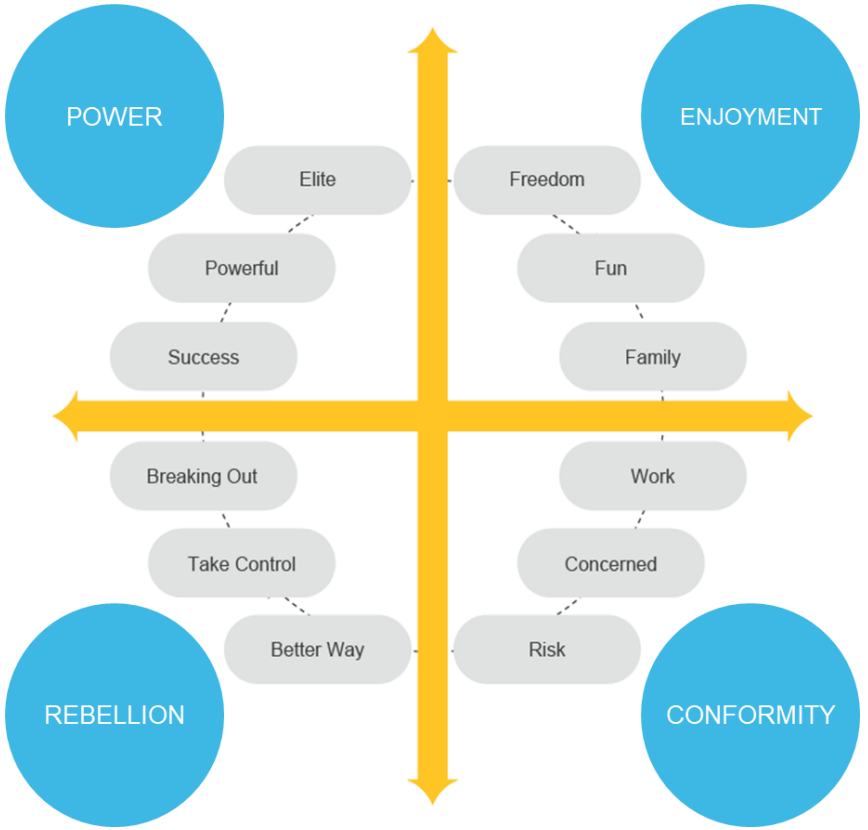
Understanding the past allows us to predict the future.

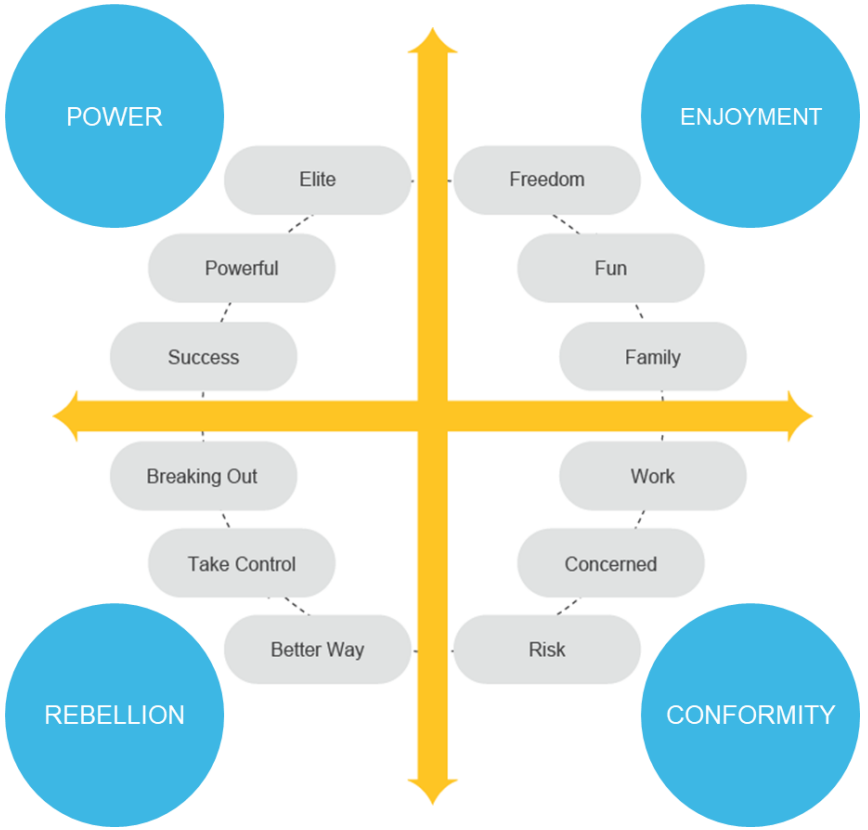
- Human values are beliefs tied to emotion. They guide actions and are ordered by importance. This importance changes over time.
- By tracking values over time we can predict trends in behaviour.
- This has implications for what kinds of food people want to consume, as well as what brands and communication styles are successful at different points in time.
- Colmar Brunton has tracked prevailing values for 16 years in Australia and beyond.



colmar brunton.

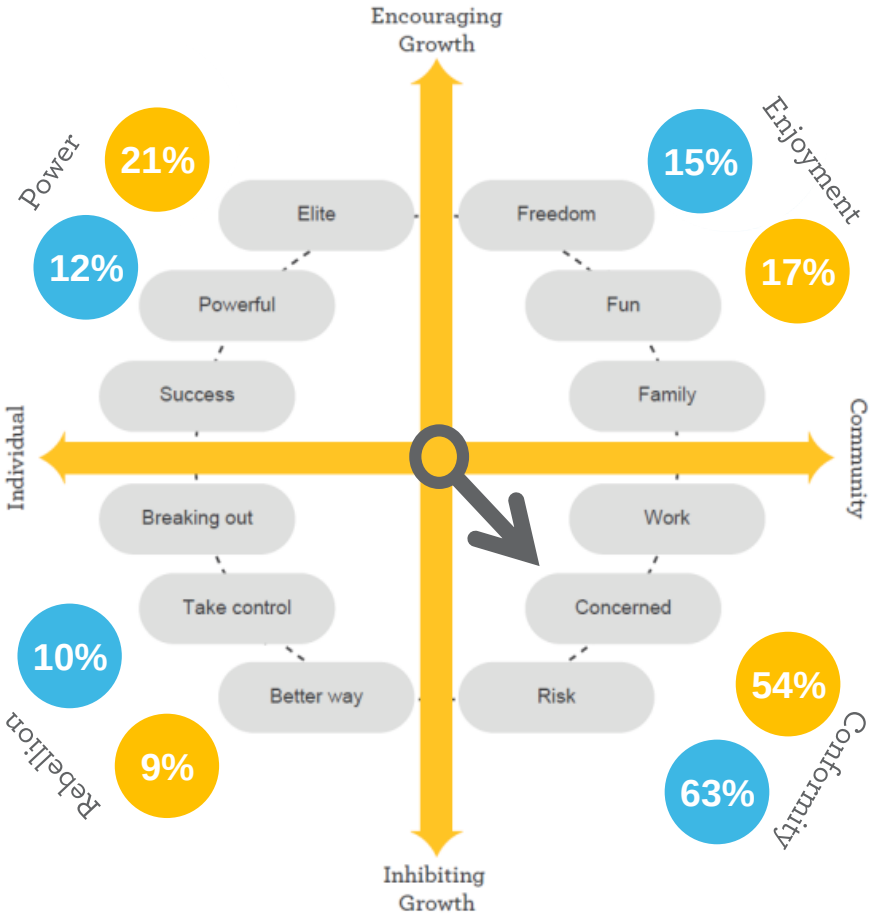
The four segments.

- **Power:** Values are the ability to make it happen.
- **Enjoyment:** Values are freedom to enjoy life in the community.
- **Conformity:** Security, predictability and everyone has a role.
- **Rebellion:** Values are the courage to change everything.



New home buyers consider Australians today to be in a period of Conformity.

While volume homes meet current societal needs, to prepare for Rebellion buyers of volume homes will be looking for greater control and individualism.



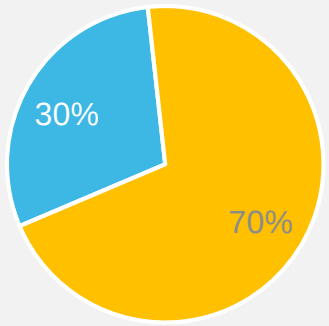
- The majority of volume home buyers rest in the conformity segment of the Millennium Monitor. This is in alignment with Australian values in the general population.
- In the current Conformity era, the shift in values have led to higher risk aversion and greater concern for society.
- Volume built homes are likely to fulfil a current desire for Conformity, bring increased security and homogeneity for buyers.
- However, as Australian society, including volume home buyers, shift towards Rebellion they are likely going to be looking for ways to make more intelligent decisions about the homes they buy while seeking greater value for money.

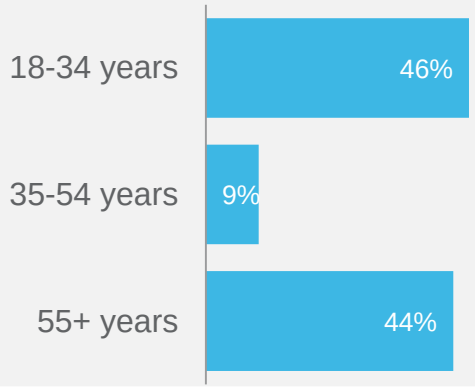
Q31. We'd now like for you to think about the different values people in Australian society might have. Each of the following options describes an era that Australian society might currently align to. In your opinion, which of the following eras do you believe Australian society aligns to most strongly at the moment? (SR) Base: Potential Home Buyers (n=108), Past Home Buyers (n=102).

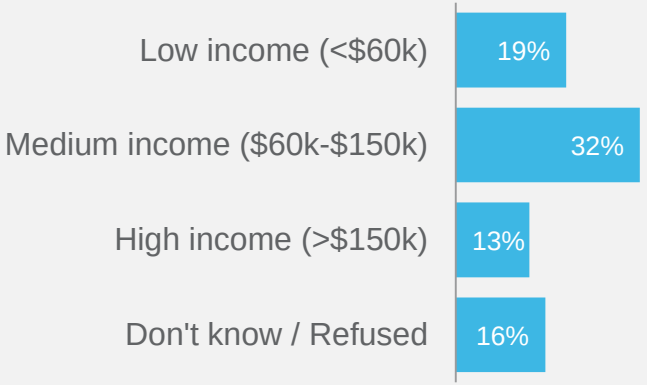
Sample profile.

Sample demographics.

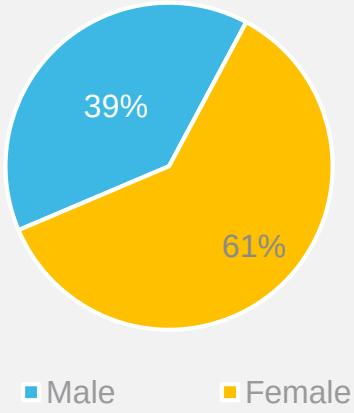
Potential

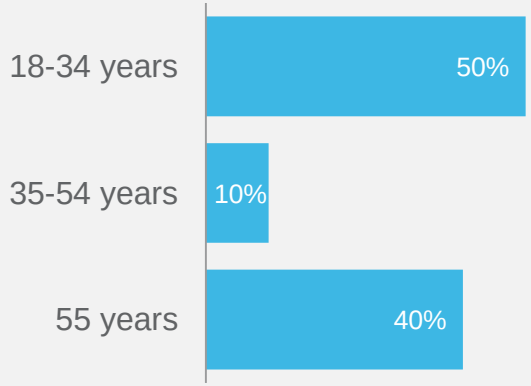


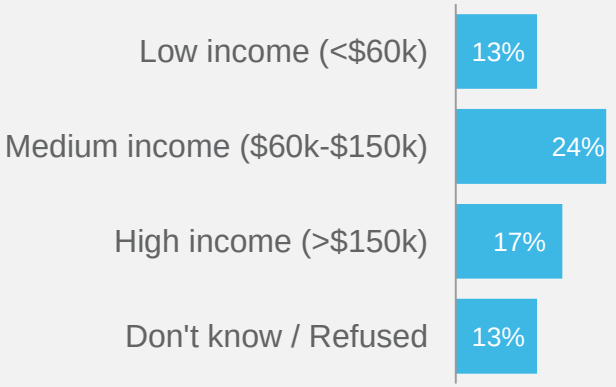




Past





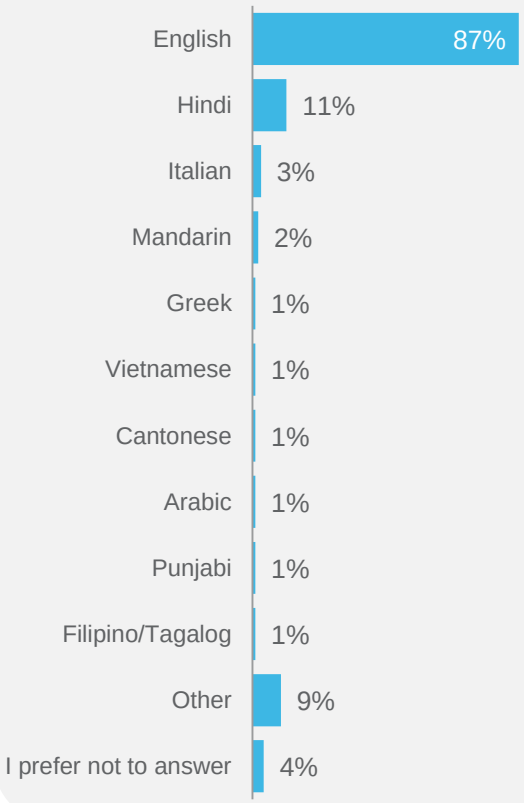


Q32. Please select your gender. (SR), Q33. How old are you? (ON), Q35. Roughly, what is your household income before tax?,
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

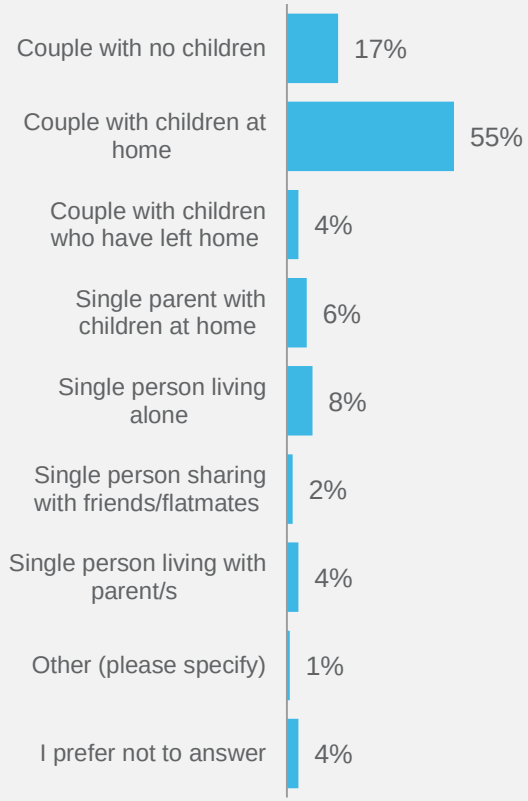
Sample demographics.

Potential

Languages spoken

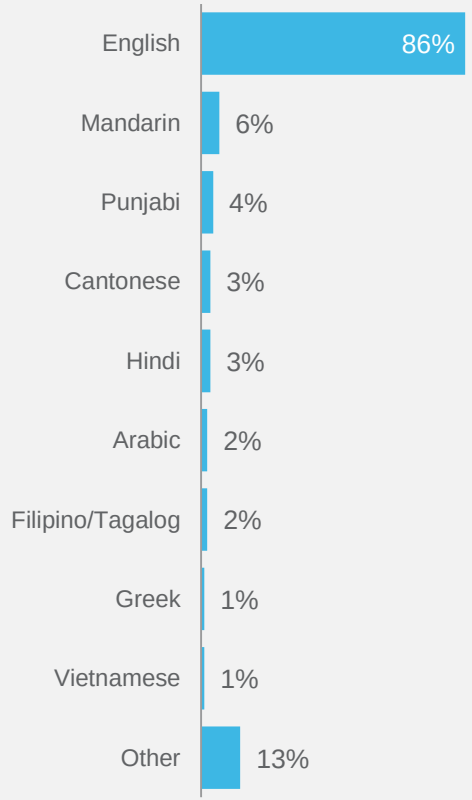


Household

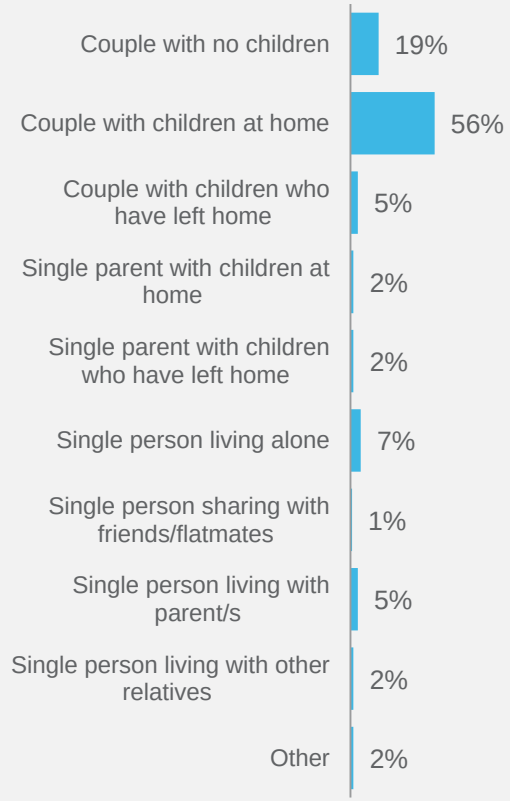


Past

Languages spoken



Household



Q34. And who lives in your household? (SR), Q36. What are the main languages your household usually speaks at home? (MR)
Base: Potential Home Buyers (n=108); Past Home Buyers (n=102)

4: VHB and LD In-depth interviews.

Interview Methodology.

This section presents the findings from interviews with ten volume home builders and land developers. The purpose of this interviews was to provide;

- An exploration of relationships and understanding between the key parties: Land Developers, Volume Home Builders and past and potential purchasers of Volume Homes
- Insight into the practices of Land Developers and Volume Home Builders including marketing, staff training etc.
- An understanding of attitudes towards the provision of ZNC homes such as perceptions of market trends and understanding of the concept of ZNC in relation to home construction and sales.

Consistent themes from the interviews.

1. Pressure of affordability, Builders and Land Developers assume that this is what drives entry-level home choice. Features relating to sustainability are considered to be available to those wealthier second or third home buyers.

2. Builders make assumptions about buyers that are not necessarily confirmed, such as first home buyers are only planning to live in the home for 6-10 years, and therefore there will not be enough time to realise the economic benefits of energy efficiency. There may also be assumptions about whether sustainable features are of relevance and interest. As the focus of the sales conversation is based upon these assumptions, information about sustainable options may not be shared.

3. There is a lack of understanding from builders and buyers on the ways in which homes can be more sustainable – beyond energy generation there is little depth of understanding of the options. There is also a lack of understanding on how to and the need to sell sustainability.

4. When VHBs have trialled new sustainable options they have generally been focused on their interpretation of the return on investment and it is upon their judgement of the trial that they make the decision on whether to put the option forward to buyers.

5. Building demand for ZNC features is possible. However, Builders and Land Developers believe that these features cannot be sold on the basis of ‘sustainability’ or ‘environmental impact’ (the term ZNC does not seem to be used). Instead, these features can be and are sold on the basis of ‘quality’ and ‘liveability’.

The pressure of affordability drives choice.

"Customers need to see that as just being a good-quality outcome for what they've bought, rather than a 'greater good' type of initiative."

Volume Home Builder and Land Developer

The dominant perception is that buyers are trying to maximise what they can get for their budget.

Builders and Land Developers both perceive sustainability to be a topic for only those that can afford it, then terms is not considered relevant.

While some developers and builders made specific mention about including some services as a new standard rather than a value add.

There is a concern that buyers do not have capacity to think about their household budgets in terms of what they will be able to save on their running costs, but are more motivated by maximising what they can afford in terms of the size of the home, plus the inclusion of fixtures and fittings.

Both Volume Home Builders and Land Developers typically stated that they avoided terms such as ‘sustainability’ and ‘environmental impact’ in the sales process. These terms were said to be off-putting to buyers and perceived as being too ‘political’ or ‘loaded’.

When these features are sold to a buyer, they are typically sold on the basis of being ‘high quality/performance’ or ‘adding to liveability’

> “You just can’t sell on ‘environmental impact’ or words like that. Buyers either do not see it as relevant, or they see it as a political issue. Instead, if we are going to sell solar or double glazing or whatever, we talk about ‘quality’ and liveability’. That goes over better.
> Volume Home Builder.

> “People are actually taking more things out of the house, not considering putting more things in. You’re never going to solve the sustainability problem until you solve the affordability problem. That’s how it is for most people.
> Volume home builder

Key area for exploration

Cost of living is increasingly relevant for Victorians, however Builders are not talking to buyers about controlling the cost of living, as it is not considered to represent an immediate financial pressure and is therefore not related to the sale of the home. It will be useful to identify if Buyers would be more open to this conversation during the sales process.

The Sales teams believe that they know what the buyer wants.

"It's all about the granite benchtops and the look and feel, I suppose, and the interior, rather than sustainability features."

Land Developer/Volume Home Builder

Although demand for land and homes is high, the sales teams believe that they know their clients best and they will require evidence to challenge their assumptions.

Some of these assumptions are based on research and analysis conducted by marketing teams, others more likely to be influenced by internal bias and personal experience.

There is an assumption that a family will need to be in a home for more than six years to realise the benefits of the expenditure on sustainable features, and there is also an assumption that first time home buyers will be moving on too quickly. There is also an assumption that buyers will be more interested in fixtures and fittings than in the running of their home.

The Sales teams have direct contact with buyers, and are therefore responsible for the delivery of information. Some companies provide information translated into other languages, whereas others employ multi-lingual; sales staff.

This has implications for the delivery of information about sustainability, but also the accuracy of this information. It will be important for Sustainability Victoria to consider ways in which it can promote high quality information such as in the training of sales staff.

> I would say I couldn't remember the last time somebody has asked us, "what is the water usage?" or "how many litres is that going to use, that particular faucet or showerhead?" They don't care. They want to look at what's bright and shiny and what they think looks best.
> Land Developer/Volume Home Builder

> The people we're selling to have nothing, they are starting fresh. They can't afford to be thinking about sustainability they are more interested in how close the home is to a hospital or school or their workplace. It's not sustainability we need it's infrastructure.
> Volume Home Builder

Key area for exploration

It will be important to understand who are the key influencers over the new home purchase, what information they deliver, and whether information is delivered on the ways in which homes could be more sustainable.

There is a lack of understanding of how homes can be made more sustainable.

"They hear a six-star energy rating for their home and think that they've ticked all the boxes for sustainability."
Land Developer/Volume Home Builder

Rooftop solar is the most commonly recognised way to make a home more sustainable, with understanding of other options limited.

Features that are included to achieve the Six Star Rating are not seen by buyers, or presented to buyers, as being sustainable.

Despite the Six Star Rating being a standard for all new builds, volume builders believe it is inadequately understood by some of their buyers. Primarily buyers are understood to see the achievement of six stars as sufficient, that they have done their 'bit' to being environmentally friendly.

Whereas other builders describe the conversation around achieving a 6-star rating being described as 'painful', and one that the sales force work to avoid. Due to the perception that the features required are expensive, and could be removed to save costs.

Therefore the sellers of volume homes are framing features, such as double glazing or blower tests, as contributing to comfort rather than sustainability in order to get them over the line with buyers.

Builders and developers are open to involving Sustainability Victoria to enhance understanding through partnerships, presence at display villages and calculators that demonstrate savings from an environmentally designed home.

> [THE STAR RATING] gets ignored, to be quite honest, because now that it's at that level where it's mandatory.
> Volume home builder

> We've had this discussion of, like, is there insulation in the walls and the ceiling? Who would even know? Who would be checking that?"
> Land Developer/Volume Home Builder

> We've started doing blower door testing of our dwellings as well… That's 100% led out of a sustainability initiative, but we would package it as part of a quality story, because we think it has more market, it's more tangible, as a quality conversation rather than a sustainability-related item.
> Volume Home Builder

Key area for exploration

It will be useful to explore whether the up-take of sustainable features that contribute primarily to comfort rather than achievement of the Six Star Rating holds appeal is the marketing of Volume Homes.

Trials have focused on ROI.

"We are focused on the best outcome from clients…by that we mean it's a value equation the cost of installation has to be less than the cost of electricity usage."

Land Developer/Volume Home Builder

Volume Home Builders have trialled some sustainable features, but more could be done.

The complexity and variety of options available is challenging for both builders and buyers, and the conclusion that few buyers prioritise such features is common.

The role of Builders is detailed as having the most wide-ranging impact from the standardisation of the build through to the promotion of features that could enable a home to reach 7-10 star status.

However, trialling sustainable features as part of display homes is often not to have delivered sufficient interest to lead to adoption.

The larger Volume Home Builders, are concerned about the risk to their market share if they do anything that adds cost. There is some appetite for increased regulation as this would create a 'level playing field', such as the current requirement to build 6-star rated homes.

> We offer solar panels and a Tesla Powerwall as standard in all of our homes. We find that our buyers love the app that comes with it that reviews their household's energy consumption when they should be using energy when they have a glut that would otherwise be sent back to the grid. *Land Developer/Volume Home Builder*

> We've started doing blower door testing of our dwellings as well, and we're looking at including that as a standard package inclusion. Land Developer/Volume Home Builder

> We once offered a 'green package' with eaves, and double glazing and other features like that. But there was almost no interest Volume Home Builder

Key area for exploration

Those charged with selling sustainable features need support to see the benefit to the customer and to their business in a market that currently has very high demand for their products. It will be important to identify which specific element of sustainable homes hold greatest appeal.

Sustainability strategies are rare for this market segment.

"We don't have a strategy in a strict sense. We do talk about sustainability sometimes with sales and marketing, but nothing properly documented."

Volume Home Builder

Sustainability strategies in the sense of sustainable builds and developments were virtually non-existent in the affordable Volume Home segment of the market.

None of the builders spoken to in the interviews stated that they had a fully documented and realised ‘Sustainability Strategy’.

Despite the fact that some of the interviewees had titles such as ‘Sustainability Manager’ – none indicated that the organisation had invested in broad guidelines for building and selling in the Volume Home market that were used with salespeople and designers.

The scant mention of initiatives similar to a Sustainability Strategy were described in terms of minimising paper usage and using energy efficient lighting in the office.

> “Yes, we do have a strategy. It encourages staff to think twice before printing, buying LED lights for the office.
> Volume Home Builder.

> “We don’t have a strategy like this for these (VOLUME HOME) builds. We do sell solar into other markets, but there isn’t a formal documented system there either.
> Volume home builder

Key area for exploration

Sustainability Victoria could explore the option to provide templates and other enabling documentation to encourage uptake of documented sustainability strategies.

Builders and developers are generally open to a partnership with Sustainability Victoria.

"Yes – absolutely – let's talk. If they have good materials for the display homes, we would be happy to have them along"

Land Developer/Volume Home Builder

Builders are open to partnerships with Sustainability Victoria through both .

Overall, builders were open to the idea of working in partnership with Sustainability Victoria – none were openly hostile to the idea and many could see direct benefits of a partnership.

Forms of partnership took two main forms:

1. A presence from Sustainability Victoria in display home, both in person and in hard-copy materials, to help potential buyers understand the benefits of sustainability features
2. Some were aware of the existence of a tool from Sustainability Victoria that can calculate potential savings from investment in solar and other sustainability features.

Underpinning each of these forms of partnership was a business interest in making bigger sale by including sustainability features in a home's design; rather than a strong interest in Helping Sustainability Victoria, or designing homes and developments with lesser impacts on the environment

> "I've heard about a tool that government is developing that works out savings on solar. We don't explain this well to buyers now. If we could get our hands on this, we would have a go.
> Volume home builder

> "If it helps us sell solar and water tanks and that, then great! You can come in to our display homes any time.
> Volume home builder

Key area for exploration

Some builders are already aware of the sustainable features calculation tool and are interested in using it with buyers. This tool has the potential to overcome a lack of understanding of the benefits of sustainability features for both buyer and builder.

5: Rapid Evidence Assessment.

Review Methodology.

- This section summarises the literature provided to Colmar Brunton at the beginning of the volume home builder project.
- The purpose of this review was to understand how zero net carbon homes are being debated and discussed in current literature.
- The review informed the subsequent design of the stakeholder interviews and buyer survey.
- A summary of the review is provided for reference – detailed assessment of each piece of research will be provided as an appendix to the final report.

Consistent themes from the literature.

1. **A number of the documents reviewed identify the need for greater regulation of the building industry.** This also includes those involved in supplying the components for home building. It is broadly concluded that the most effective means of achieving Zero Net Carbon homes will be to regulate and effectively inspect the work of builders.

2. **However, it is also felt that the rewards for the building industry require more emphasis.** Voluntary codes of practice would ensure greater compliance, while those that are enforced may be less likely to achieve organic support from industry. However, even using voluntary codes of practice, it would be useful if a comprehensive process of checking is enacted to ensure compliance.

3. **The literature also identifies a need to generate demand from home buyers.** It is recommended that this is achieved through a variety of educational and awareness raising initiatives. Some of this awareness raising should be led and communicated via the individual builders, which could form part of the regulation.

4. **Education is identified as a specific issue for builders and buyers.** The definition of sustainability is often narrowly interpreted to focus on energy and water consumption, and buyers feel that the topic is too complicated to allow understanding of the features being purchased. Greater education of buyers will be essential if the value of zero net carbon homes is to be understood.

5. **There is also evidence on the benefit of incentives for encouraging home buyers.** These incentives could take the form of access to higher value loans; because of the reduced living costs generated by a carbon neutral home, or the emphasis on the reduced living costs that will benefit the homeowner more generally.

Towards sustainable volume housing: A tale of three builders.

This PhD thesis sought to answer the following research questions:

- How have Australian volume home builders responded to the challenge to build more sustainable housing?
- What can we learn from their experiences to better promote and support ongoing effective uptake of more sustainable housing within the industry?

The primary research with representatives from three building companies in Melbourne found that the interpretation of sustainability is relatively narrow; with a focus on energy and water. Builders also focus on meeting the condition of regulations, rather than aspiring to design homes that are as sustainable as possible.

Findings

The research found that more could be done to broaden builders' understanding and interpretation of sustainability. Also, that buyer interest could be enhanced if builders do more to promote the sustainable features of their houses.

However, it is not just builders that require attention, but also the organisations involved in the supply of the building materials, and the author suggests that there is work for Government to do in regulating the manufacture of these materials.

The author recommends that regulation, education of builders, and financial stimuli for buyers would help to increase the uptake of sustainable homes.

Towards sustainable volume housing:

A tale of three builders

A thesis submitted in fulfilment for
the degree of Doctor of Philosophy

Fiona Martin
BE (Env) (Hons)

School of Global, Urban and Social Studies
RMIT University
May 2013

Energy Consumer Sentiment Survey: Key findings for households.

This report presents the results of the bi-annual Energy Consumers Australia survey, and reports on household and small business consumers, with a particular focus on satisfaction, confidence and activity with energy services. The report is designed to educate the energy market and assist policy development by assessing consumer views and their management of usage and costs within the energy market.

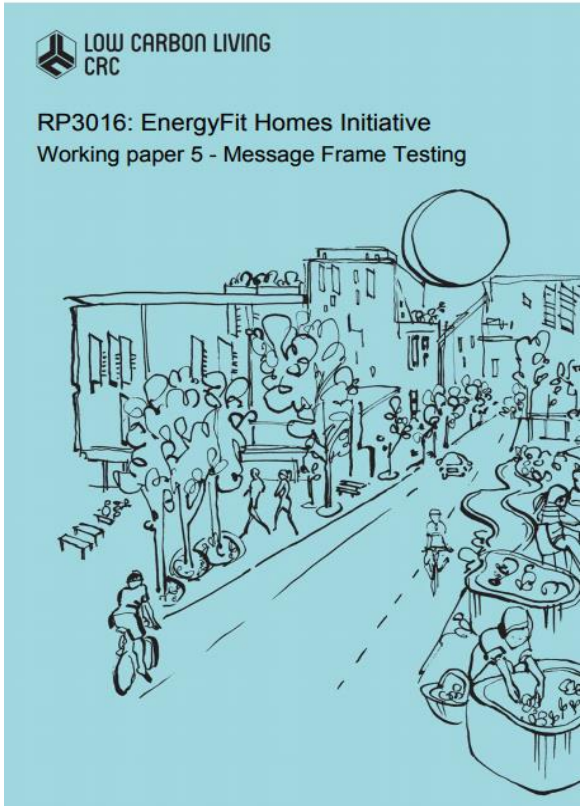
Findings

- Findings from June 2017 found there was improved satisfaction with competition and energy services in their area.
- Compared with other states electricity satisfaction was seen to drop in both SA and WA.
- Households were found to have low confidence in the information available and the tools to assist energy use and costs.
- Consumers with greater variety in energy providers were more likely to consider switching. Those that do switch mostly did so due to dissatisfaction with value for money. However, it was also reported that approximately 50% of households never switched.
- It was noted that results may be impacted by several key events that occurred during collection, this included seasonal trends in winter regarding satisfaction, value for money and reliability.

Retrieved from:
http://energyconsumersaustralia.com.au/publication/energy-consumer-sentiment-survey-findings-june-2017/

Low Carbon Living: EnergyFit Homes Initiative working paper 5 – Message Frame Testing.

The EnergyFit Homes Initiative was designed to understand what motivates consumers to purchase and lease low carbon homes. This study used an random design with an online survey of n=2,008 potential and recent home buyers to investigate the effectiveness of nine different message frames in promoting the benefits in low carbon energy homes. Respondents were randomly assigned to one of the nine message frame conditions and asked to evaluate the EnergyFit home against a 'Control' and a 'Features' home.



Findings

- While price was expected to be higher for the EnergyFit home, it was preferred over alternatives on financial and non-financial criteria.
- There was a greater preference for the EnergyFit home when; buyers defined a comfortable home as being easy to heat and cool, trusted government rating schemes and had positive willingness to pay.
- Considering the messaging itself, message frames were seen to be influential in determining perceived benefits of low carbon homes.
- Demographics were poor predictors of preference between the messages.
- Overall messages that emphasised liveability resonated and delivered positive results.

Retrieved from:
http://www.lowcarbonlivingcrc.com.au/research/program-3-engaged-communities/rp3016-EnergyFit-Homes

New home buyers and the challenges of navigating sustainability and energy efficiency with Australian volume builders.

This study utilised semi-structured interviews and an online survey across Victoria in order to explore the experience, decision making and barriers that exist within the homebuyers market when building a sustainable and energy efficient house.

Findings

- It was found that consumer interest, willingness to pay and subsequent demand is present, although poor communication and understanding of available options restricted their ability to achieve sustainable, energy efficient housing.
- The paper also suggested that sustainable options were treated more like an add on than an actual desired option.
- Further, conversations on the topic were mostly initiated by the homebuyer. Given this, the paper suggested that the burden falls on the builders to improve their communication and engagement programs to ensure they are actively discussing and encouraging options.
- Concluded that changes need to be made to convert homebuyers awareness and interest in sustainability to engagement and implementation. While also suggesting that builders and developers need to enhance their knowledge of the consumers' attitudes, preferences and options.

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8th International Conference on Sustainability in Energy and Buildings, SEB-17, 5 – 7 July, 2017 Chania, GREECE

New homebuyers and the challenges of navigating sustainability and energy efficiency with Australian volume builders

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Abstract

The energy efficiency performance of new housing construction in Australia lags behind the developed world; with builders blaming homebuyers for their lack of interest and willingness-to-pay. This research investigates homebuyers' experience of building a new home to explore the barriers to implementation building a new home. Contrary to builders' perceptions and recent reports, the research found homebuyers want increased sustainability and energy efficiency; yet are not able to effectively achieve this due to lack of communication with the builder, poor information and limited options available. This study demonstrates that latent demand exists and volume builders should reconsider their communication and engagement with consumers.

Peer-review under responsibility of KES International.

Keywords: Energy efficiency; residential construction; homebuyers; consumers

Investigating demand-side stakeholders' ability to mainstream sustainability in residential property.

This paper investigated how demand and supply of new housing is impacting the ability for sustainable housing to become mainstream and how to best encourage mainstream sustainability within the housing industry.

Findings

- This paper concluded that sustainability is deemed as an expense extra and is therefore in low demand.
- It also identified barriers such as a poor and inadequate implementation of regulations and consumers being distrusting of suppliers.
- To change this the paper suggested that consumers need to be empowered to demand, and to be provided with knowledge of low carbon options. To help encourage adoption and mainstream use of low carbon homes.
- However it also stressed the importance of making immediate changes to housing. This conclusion is emphasises with the finding that houses currently have a life of around 50 years, and therefore ongoing construction of houses will continue to waste finite resources unnecessarily.

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Taylor & Francis Group

Investigating demand-side stakeholders' ability to mainstream sustainability in residential property

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ABSTRACT

Current sustainability approaches in the residential property sector for new home construction are deficient, yet crucial in reducing reliance on finite resources whilst providing better social outcomes. At present, efforts to improve dwelling sustainability are inhibited: as sustainability is considered an overly expensive additional extra; there is poor implementation of energy efficiency regulations; un-empowered consumers are unable to demand sustainability and consumers distrust the suppliers of sustainable initiatives. This research addresses an important issue to eliminate the "blame game" and transform the sustainability conversation, adoption and value in new home markets. It adopts an innovative demand-side approach to the residential property sector, in order to target large-scale standardised new home producers as the pivotal, demand-side player in mainstreaming sustainable solutions in new housing. By examining the sector from this new perspective, sustainability can be mainstreamed in the new housing property sector overcoming current inhibitors to sustainability adoption and implementation.

ARTICLE HISTORY
Received 6 January 2016
Accepted 2 March 2016

KEYWORDS
Homebuyers; supply chain framework; sustainability; residential property; volume homebuilders

Introduction

Currently in Australia, sustainability is not being adopted in the new residential property sector at the rate that is necessary to meet long-term aspirations for sustainability in the Australian built environment. Sustainability here means not just energy efficiency technologies that could be added to new and existing housing but the intrinsic features that can only be incorporated in new construction like siting orientation, window sizes, and construction detailing and materials. In this $33 billion per annum industry (Australian Bureau of Statistics, 2014), the adoption of broad-scale sustainability in new housing is limited with long-term environmental, social, and economic repercussions that will burden current and future generations. There are a number of reasons why this slow adoption might be the case.

First, the adoption and implementation of energy efficient and sustainability features in new houses are considered overly expensive additional extras due to limited consumer demand. The housing consumer (new homebuyer) is thought to not want to bear the brunt

Feasibility of zero carbon homes in England by 2016: house builder's perspective.

Following the UK Governments' 2050 carbon emission target, this paper examined the role of the housing sector, which is responsible for 27% of carbon dioxide emissions. This paper specifically addressed the feasibility of the housing industry to achieve their goal of building zero carbon homes by 2016. The study utilised a quantitative survey and in-depth semi structured interviews with major housing developers.

Findings

- The paper established that there a multitude of barriers (legislative, cultural, financial, technical) that are impacting achievement of the carbon target.
- The authors believed the target could be achieved if realistic strategies were adopted and implemented throughout the supply chain of home building.
- They also suggested that the major drivers for zero carbon homes include mandatory legislation, supply chain innovation, business risk of future legislation and reduction in potential sales price premiums. Further, they suggest that the UK Government must legislate to assist growing demand and create a national market for zero carbon homes.
- The paper also acknowledged that concerns exist regarding commercial benefits and costs of zero carbon homes, which were relatively unclear at the time of writing.

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Building and Environment

journal homepage: www.elsevier.com/locate/buildenv

Feasibility of zero carbon homes in England by 2016: A house builder's perspective

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ABSTRACT

The UK government set itself a 60% reduction of carbon dioxide emissions target on 2000 levels by 2050. This commitment will require carbon reductions to be made by all industries including the housing sector which presently accounts for 27% of carbon dioxide emissions. The house building industry is the subject of numerous government policies and legislation, but none are as demanding as the Code of Sustainable Homes, which set a 'world-beating' target for all new homes to be zero carbon by 2016. This paper sets out to investigate the feasibility of building zero carbon homes in England by 2016 from a house builder's perspective. A comprehensive opinion of the feasibility of zero carbon homes is gathered through a questionnaire survey and in-depth semi-structured interviews with the major UK housing developers. The research found that there are currently numerous legislative, cultural, financial and technical barriers facing house builders to deliver zero carbon homes in England by 2016. The house builders surveyed concurred that these challenges are not insurmountable provided that a swift, all-embracing and above all realistic strategy is adopted and implemented across the supply chain.

1. Introduction

Climate change has established itself as a major issue, which requires an urgent and coordinated global response. To help tackle global warming, the UK is putting itself on a path to cut its carbon dioxide emissions by some 60% on 2000 levels by 2050, with real progress by 2020 [1]. This was superseded by a government announcement in October 2008 for a more ambitious target committing the UK to cut greenhouse gas emissions by 80% by the middle of the century [2]. This commitment will require carbon reductions to be made by all industries including the housing sector [3]. Carbon dioxide emissions from the housing sector have risen by more than 5% since 1997 and account for 27% of the UK's carbon footprint [1]. The government has consequently highlighted the house building industry as a key sector where carbon reductions can be made. The UK house building industry has been the subject of numerous government reports and initiatives in recent years, such as the previous Deputy Prime Minster Office's £60K home programme, which was launched in 2004 and targeted production rates and the affordability of new build homes [4]. Indeed, the programme has challenged the house-building industry to look at how it can make construction methods more efficient by designing and building to high standards for a housing unit construction cost of £60,000. As a result, house builders are under increasing pressure to provide sustainable as well as affordable housing whilst increasing production rates to 240,000 units per year by 2016 [5]. In December 2006, the government published the Code for Sustainable Homes (CSH) as a pathway to achieving zero carbon homes in England [6]. The CSH sets ambitious targets for the house building industry, for which the commercial benefits and costs are still unknown. The aim of this paper is to examine the feasibility of zero carbon homes in England by 2016 from house builders' perspectives.

2. Low carbon housing drivers

Despite the current economic and political environment, multiple drivers exist for the development of low carbon housing in the UK. These are broadly clustered under three categories: business, cultural, and legislative drivers, which are examined below.

2.1. Business drivers

With a substantial number of house builders being amongst the largest companies in the UK, there is a growing culture of corporate

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0360-1323/$ – see front matter

Retrieved from:
https://www.sciencedirect.com/science/article/pii/S036013230900016X

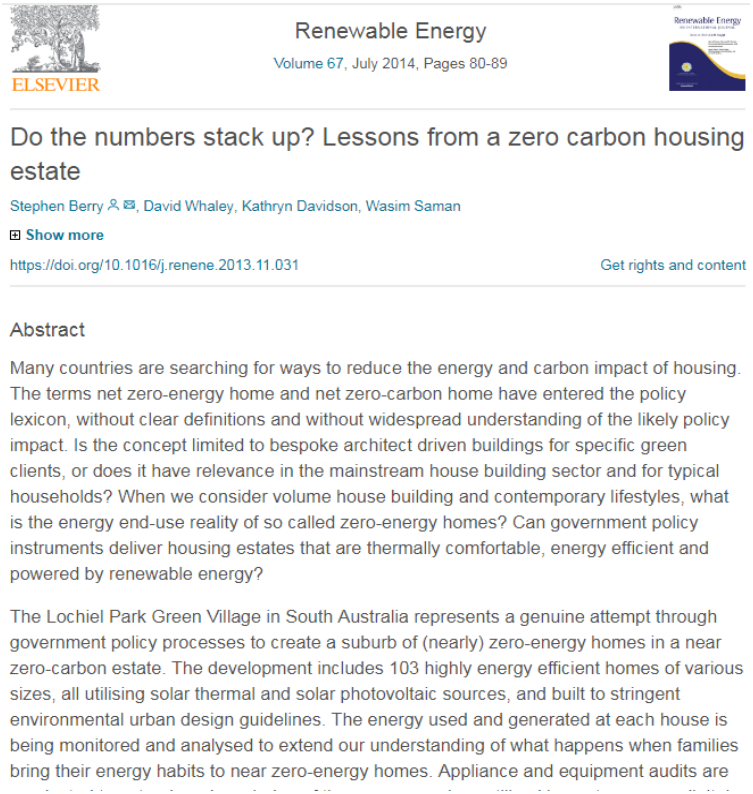
Do the numbers stack up? Lessons from a zero carbon housing estate.

The article explores the appliances and equipment in a zero net carbon estate to understand how they contribute to near zero-energy homes. It also discusses the relevance of zero-energy and net zero-carbon homes to both architectural green clients and mainstream buildings and households.

The paper studied the example of Lochiel Green Village in South Australia where data was collected using the 'EcoVision' real time monitoring system which allowed residents instant access, as well as personal historical comparison tools of their energy use.

Findings

- The study found that despite net zero energy standards being used, reductions in operating energy use were infrequently met. Instead, it was the selection of energy systems, as well as individual behaviour, that was primarily responsible for large variations in energy usage across households.
- The authors also established that there is a direct correlation between the number and type of appliances and total energy usage, rather than size of home.
- The paper also suggested that restricting underfloor heating, enforcing lighting density standards, using energy efficient equipment and larger solar systems, are best ways to increase efficiency of a home.



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Renewable Energy

Volume 67, July 2014, Pages 80-89

Do the numbers stack up? Lessons from a zero carbon housing estate

Stephen Berry, David Whaley, Kathryn Davidson, Wasim Saman

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https://doi.org/10.1016/j.renene.2013.11.031

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Abstract

Many countries are searching for ways to reduce the energy and carbon impact of housing. The terms net zero-energy home and net zero-carbon home have entered the policy lexicon, without clear definitions and without widespread understanding of the likely policy impact. Is the concept limited to bespoke architect driven buildings for specific green clients, or does it have relevance in the mainstream house building sector and for typical households? When we consider volume house building and contemporary lifestyles, what is the energy end-use reality of so called zero-energy homes? Can government policy instruments deliver housing estates that are thermally comfortable, energy efficient and powered by renewable energy?

The Lochiel Park Green Village in South Australia represents a genuine attempt through government policy processes to create a suburb of (nearly) zero-energy homes in a near zero-carbon estate. The development includes 103 highly energy efficient homes of various sizes, all utilising solar thermal and solar photovoltaic sources, and built to stringent environmental urban design guidelines. The energy used and generated at each house is being monitored and analysed to extend our understanding of what happens when families bring their energy habits to near zero-energy homes. Appliance and equipment audits are

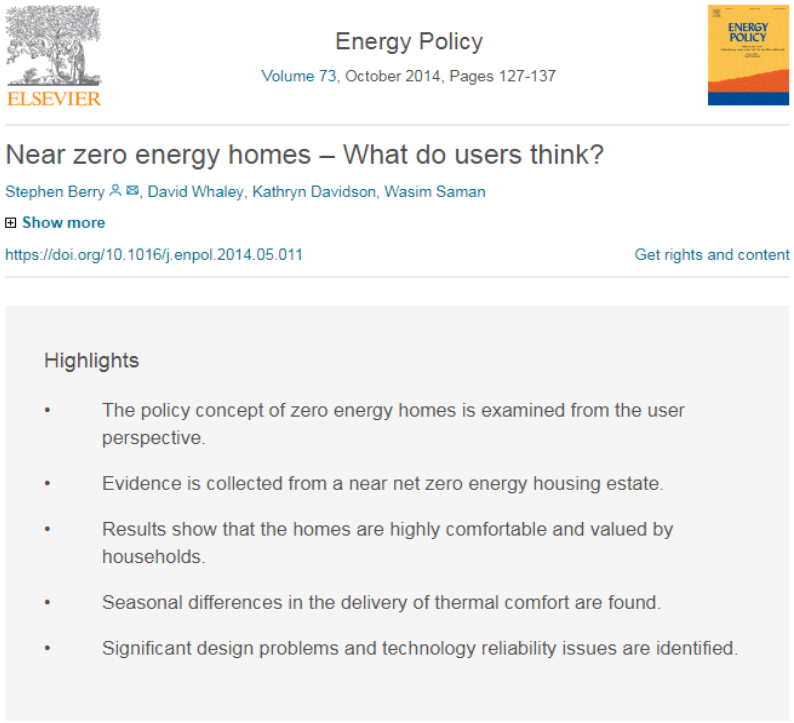
Retrieved from:
https://www.sciencedirect.com/science/article/pii/S0960148113006095

Near zero energy homes – What do users think?

This paper explored zero energy homes from the users' perspective, focusing on both comfort and efficacy in operating technologies. This paper employed interviews and energy monitoring across Lochiel Park (SA) and ensured representativeness and generalisability by making comparisons to Mawson Lakes in nearby Campbelltown.

Findings

- The authors found that users of zero net energy homes saw value in their properties, believing they are comfortable and have reduced energy bills.
- Thermal comfort was found to vary seasonally with temperatures outside desirable range in both summer and winter. In particular uncomfortable upstairs temperatures were mentioned.
- This discomfort led to users questioning their builders' ability to create homes that were comfortable across spaces and all seasons.
- However, Lochiel Park houses were significantly more efficient in space heating and cooling, compared to Mawson Lakes.
- The paper suggested that it is essential for policy makers to provide appropriate compliance processes for builds and specifically mentioned to create a 'whole building thermal comfort standard', and amend it to home energy rating tools.



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Energy Policy

Volume 73, October 2014, Pages 127-137

Near zero energy homes – What do users think?

Stephen Berry, David Whaley, Kathryn Davidson, Wasim Saman

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https://doi.org/10.1016/j.enpol.2014.05.011 Get rights and content

Highlights

- The policy concept of zero energy homes is examined from the user perspective.
- Evidence is collected from a near net zero energy housing estate.
- Results show that the homes are highly comfortable and valued by households.
- Seasonal differences in the delivery of thermal comfort are found.
- Significant design problems and technology reliability issues are identified.

Retrieved from:
https://www.sciencedirect.com/science/article/pii/S0301421514002924

Preferences for sustainable, liveable and resilient neighbourhoods and homes: A case of Canberra, Australia.

In this study the CSIRO surveyed 300 residents from Canberra, to explore the preferences of residents regarding sustainable neighbourhoods and homes. Questions were asked about their buying history and intention, neighbourhood and home features and demographics of the buyers.

Findings

- This study identified the most desirable sustainable features for residents including affordability, energy saving design for good temperature control, safety of neighbourhood and cleanliness. While the least preferred features were green facades and communal bins.
- Significant differences among gender, income, age, green technology behaviour were seen, although the core features are consistent. For example women rated 17 factors as more important compared with the ratings of men, these were recycled construction materials, environmentally friendly building and affordability. While men saw temperature control across seasons to be more important.
- The researched emphasised a need to understand the relative importance of features and how individuals trade-off between them to offer sustainable, resilient and liveable homes.

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Sustainable Cities and Society

Volume 37, February 2018, Pages 133-145

Preferences for sustainable, liveable and resilient neighbourhoods and homes: A case of Canberra, Australia

Sorada Tapsuwan [a], Claire Mathot [a], Iain Walker [a, 1], Guy Barnett [b]

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https://doi.org/10.1016/j.scs.2017.10.034

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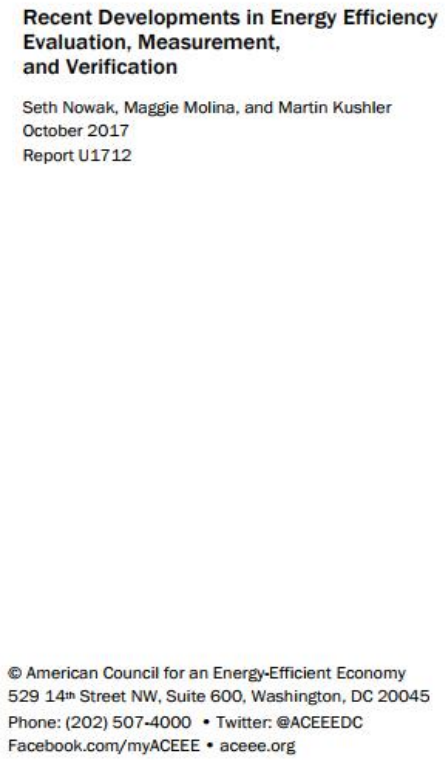
Highlights

- A comprehensive review of empirical literature evaluating sustainable, liveable, and resilient features of the neighbourhood and home.
- The first one of its kind to evaluate all three – sustainable, liveable, and resilient – features of both the neighbourhood and home in a single study.
- Presents an importance ranking by buyers and investors of 67 neighbourhood and 38 house features.

Recent Developments in Energy Efficiency Evaluation, Measurement, and Verification.

This paper examined how the evaluation, measurement and verification of energy efficient programs has changed over time. This paper used a mixed methodology of expert interviews, a literature review and research examples. The paper stress the role of Evaluation, Measurement and Verification (EM&V), and how it is instrumental in the planning, development and deployment of energy efficient utility system resources.

The papers discussion centred on the EM&V 2.0, a new EM&V tool that utilises increasingly available data. Although still not fully developed and adopted, it will provide faster, more valuable information.



Findings

The key findings in this research relate to the challenges of EM&V in the future, which include:

- Ensuring EM&V has ongoing relevance in the future despite difficulties identifying its net impacts.
- Being able to identify the most useful and important data in the program among the vast amounts of information it collects.
- How to use the data to improve communications with policymakers and regulators.

Retrieved from:
http://aceee.org/research-report/u1712

LENDERS Improving energy costs in mortgages promoting energy efficiency in homes.

The LENDERS project was set up to analytically examine the link between property energy efficiency and fuel bills in the United Kingdom, and ways in which this link could enable homes with better energy performance to be able to demonstrate lower fuel costs in a way that can be passed on as a tangible benefit to homebuyers.

Findings

The authors sought to prove that there would be merit in encouraging mortgage lenders to consider the financial burden that a home buyer would be undertaking if they purchased a home that was not designed to limit energy consumption.

The study noted that previous research has shown that building indicators alone can explain at least 40% of the variability in energy use, and that these are more important than occupancy levels in explaining space heating demand.

The study provided guidance on the calculation of energy expenditure and their contribution to living costs. However, it acknowledges that increased clarity will be required, and that homebuyers may be not be clear on the process currently undertaken. The study found that homebuyers were open to fuel efficiency being taken into account in the calculation of their mortgage, however there will be complexity in the communications with lenders and builders as well as homebuyers.

Retrieved from:
ASBEC June 2012, Institute for Sustainable Futures, University of Technology, Sydney, Authors: Chris Riedy, Aleta Lederwasch and Steve Harris

Volume Home Building: The Provision of Sustainability Information for New Homebuyers.

This paper investigated the sustainability information that homebuyers are provided with by builders, as communicated through their websites; collected from analysis of Australia's Home Industry Association's top 100 volume builders' websites and their provision of sustainability information.

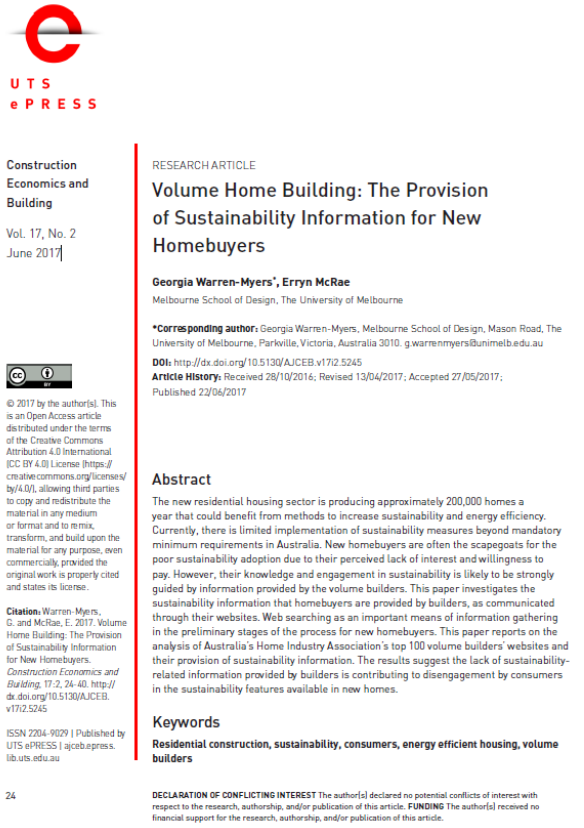
Findings

The paper suggested that the lack of sustainability related information provided by builders is contributing to disengagement by consumers in the sustainability features available in new homes.

It also acknowledged that buyers are reliant on the information, education, guidance and provision of products that engage their interest and desire. When a buyer lacks confidence in a product, e.g. a sustainable feature, they will often be unwilling to invest. They also need to trust the information with which they are being provided.

As a result, when building a new home, information will primarily be obtained from builders. Therefore it will be particularly relevant for the current Sustainability Victoria study to understand what support builders require to educate new home buyers to make sustainable choices.

This research study identified that Mirvac and Frasers placed information about sustainability more prominently on their website, however broadly that there is a general lack of information. The article concludes that volume home builders need to better communicate their sustainable offers when they do exist.



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RESEARCH ARTICLE

Volume Home Building: The Provision of Sustainability Information for New Homebuyers

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Abstract

The new residential housing sector is producing approximately 200,000 homes a year that could benefit from methods to increase sustainability and energy efficiency. Currently, there is limited implementation of sustainability measures beyond mandatory minimum requirements in Australia. New homebuyers are often the scapegoats for the poor sustainability adoption due to their perceived lack of interest and willingness to pay. However, their knowledge and engagement in sustainability is likely to be strongly guided by information provided by the volume builders. This paper investigates the sustainability information that homebuyers are provided by builders, as communicated through their websites. Web searching as an important means of information gathering in the preliminary stages of the process for new homebuyers. This paper reports on the analysis of Australia's Home Industry Association's top 100 volume builders' websites and their provision of sustainability information. The results suggest the lack of sustainability-related information provided by builders is contributing to disengagement by consumers in the sustainability features available in new homes.

Keywords

Residential construction, sustainability, consumers, energy efficient housing, volume builders

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colmar brunton.

Mainstreaming High Performance Zero Energy Homes.

This research outlined the objectives and plans from a current research study that reviewed the appetite of developers and buyers for zero net energy homes.

The study is ongoing and has been designed to obtain an understanding of the cost impacts of new detached residential homes operating at net zero energy status. It is anticipated that zero net energy status will be achieved through a combination of improved energy efficiency in the running of the home and appropriately sized photovoltaic systems to generate the energy required by the home.

The research methodology uses a case study approach comparing 'base' designs as proposed by builders, with 'modified' designs arising from a collaborative design exercise involving the project research team and the participating builder's team.

The primary research will be complete by June 2018, and will include a review of potential buyers' preferences in the purchase of zero net energy homes. The research with potential buyers will evaluate their interest in the specific sustainable features of the home; including zero energy home status, cost implications and payback periods, comfort and liveability factors.

Findings

This study will be of particular relevance to the current Sustainability Victoria research as it will collect quantitative data from Victorians who have viewed a zero net energy display home; representing the views of the Victorian home buyer, albeit those who are more engaged with sustainable messaging.

MAINSTREAMING ZERO ENERGY HOUSING

PROJECT OVERVIEW

LOW CARBON LIVING CRC

BACKGROUND

Residential housing in Australia is recognised as a significant contributor of greenhouse gas (GHG) emissions, with the majority of emissions being generated during the operational phase of buildings. With around 100,000[1] houses built each year, and with the average operational GHG emissions in the order of 7 tonnes per dwelling[2], total emissions could be reduced by around 700,000 CO2-e per year if all new home were built as 'Zero Energy Homes'.[3] Simply put, Zero Energy Homes, (or Net Zero Energy Buildings), are designed and built to consume the same, or less, energy than they produce on an annual basis. Typically, ZEH buildings are highly energy efficient, through good design and quality construction, and include an appropriately sized roof-top solar power generation system to match their estimated power load during occupancy.

As Australia works towards meeting its carbon reduction target of zero emissions by 2050, the housing sector can play an important role in meeting this goal. Internationally the European Union and the State of California (USA) already have regulations in place to adopt ZEH for all newly constructed homes by 2020.[4,5] Meanwhile, Australia is still taking relatively early steps towards improving residential energy efficiency. This project aims to develop a better understanding of the construction cost implications and consumer interest of ZEH in Australia, whilst building industry support for ZEH homes amongst residential developers.

RESEARCH TEAM

The research project is being lead by Dr Josh Byrne and Professor Peter Newman of Curtin University. The research team will include post-doctoral research staff support, plus specialist input from CSIRO and Josh Byrne & Associates. The project will also draw on the experiences from other related CRCLCL and industry projects and activities, such as RP3029: Driving a National Conversation on Energy Efficient Housing, CSIRO Liveability and CSR Comfort Tune.

CRC for Low Carbon Living

The CRC for Low Carbon Living (CRCLCL) is a national research and innovation hub that seeks to enable a globally competitive low carbon built environment sector and is supported by the Commonwealth Government's Cooperative Research Centres (CRC) programme.

With a focus on collaborative innovation, the CRCLCL brings together property, planning, engineering and policy organisations with leading Australian researchers. The CRCLCL develops new social, technological and policy tools for facilitating the development of low carbon products and services to reduce greenhouse gas emissions in the built environment. For more information visit www.lowcarbonlivingcrc.com.au/

Retrieved from:
Internal document provided by Sustainability Victoria, published April 2017

Critical Factors of Promoting Market Demand of Sustainable Housing in Australia.

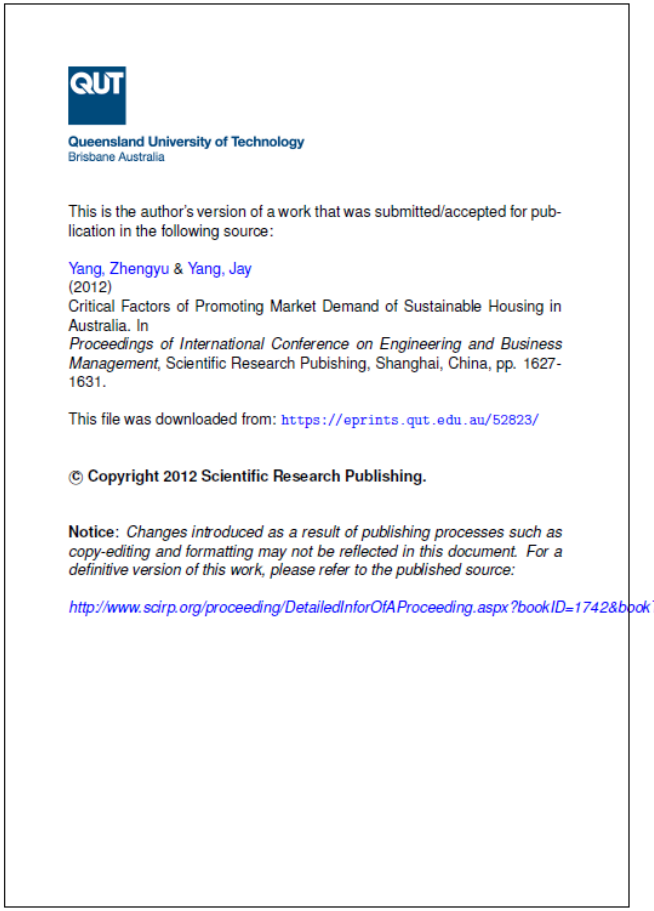
This research investigated multiple factors that affect key stakeholders benefits in sustainable housing implementation. This quantitative and qualitative study of builders in Australia revealed four key themes shape sustainable building decision-making:

- Economic factors,
- Institutional factors,
- Technical and Design factors, and
- Socio-cultural factors.

Findings

This research found that a key challenge exists in persuading builders of the business benefit of developing sustainable homes. Builders' decision-making is primarily driven by profit and therefore they need to be persuaded that they can make a significant profit from the development of a sustainable home.

The study concluded that Government will either have to regulate to ensure that builders make their homes more sustainable, or successfully educate the buyers so as to ensure they are demanding sustainable homes. It acknowledges that such developments in education will take some time and therefore while this takes place some increased regulation should take place.



Retrieved from:
2012, Proceedings of International Conference on Engineering and Business, Management, Scientific Research Publishing, Shanghai, China, pp. 1627-1631.

Behaviour Change Programs: Status and Impact.

This report reviews the findings of a study of various behaviour change activities that sought to encourage household energy saving. It categorises the ways that behaviour change can be created as follows:

- Information,
- Social interaction, and
- Education.

Findings

The report concluded that the most effective means to create energy-saving behaviour change is via education. This approach requires the greatest engagement with households via training on energy management and therefore would require the greatest level of investment. It is also likely to attract the more committed households.

Greater energy savings are also found to be generated from projects that involve a greater number of interventions, they also benefit if residential, commercial and industrial customers all participate.

In order to choose the ideal program, administrators should first consider the audience and behaviour they want to target, and then tailor a program to address them. Community-based social marketing offers one effective model for this process. The study recommends the recruitment of community champions as advocates of the social-marketing program, and focus on a long-term goal with supportive information delivered to maintain participation in an energy saving scheme.


Behavior Change Programs: Status and Impact

Reuven Sussman and Maxine Chikumbo
October 2016
Report B1601

Retrieved from:
2016, Report B1601, American Council for an Energy Efficient Economy

APEC Nearly/Net Zero Energy Building Road map.

This presentation makes the case for the increased uptake of Zero Energy buildings; covering what a zero net energy building is, the impact that they would deliver and therefore why they should be embraced, and how this might be achieved.

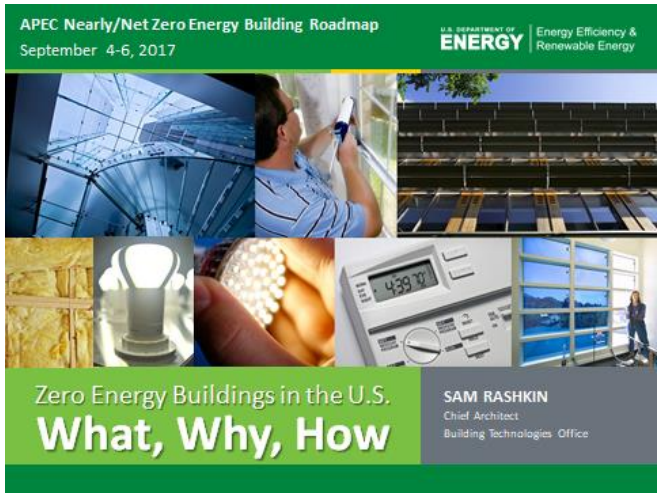
Findings

The US Government estimates that if 30% of new homes in America were high performance by 2030, the country would experience utility bill savings of Approximately $150 billion.

The presentation also outlined the ways in which potential homebuyers could become more informed about Zero Energy Buildings:

- Thermal defects,
- Advanced windows,
- Moisture Risks,
- Quality HVAC,
- Health Risks,
- True costs,
- Trusted performance,
- Better home experience, and
- Zero Energy Ready Homes.

It argued that if homebuyers were better educated on these elements they would be more likely to seek to purchase energy efficient homes.

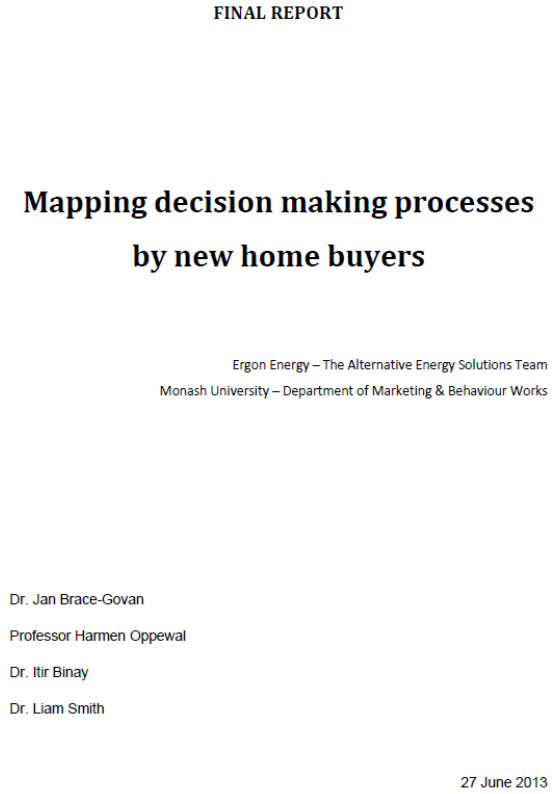


Retrieved from:
September 2017, Sam Rashkin, Chief Architect, Building Technologies Office, US Department of Energy, Energy Efficiency and Renewable Energy

Mapping decision making processes by new home buyers.

Ergon Energy undertook this study with Monash University to investigate how to best increase the uptake of energy smart homes in order to better manage peak power demand and slow its continuing growth.

This research used a mix of telephone and online interviewing to obtain data from residents living in Northern Queensland. The data obtained was used to create two models; the first being *The Basic Structure of Consumer Decisions*, which revealed consumer knowledge structures when building homes. The second model, the *Decision Making Processes in Building a New Home*, examined the key knowledge points that home builders may or may not engage with when building.



FINAL REPORT

Mapping decision making processes by new home buyers

Ergon Energy – The Alternative Energy Solutions Team

Monash University – Department of Marketing & Behaviour Works

Dr. Jan Brace-Govan

Professor Harmen Oppewal

Dr. Itir Binay

Dr. Liam Smith

27 June 2013

Findings

This study concluded that there are ten areas in which Ergon Energy could readily intervene to help consumers reduce their demand. These areas are: land, house design, colour, solar panels, landscaping, pools, floor tiles, lighting, and appliances. The authors also make suggestions for how to best engage and communicate to home buyers, these are through:

- Strengthening relationships in the building supply chain, particularly with builders who will need to provide designs that conserve energy, and
- Providing a one-stop service where consumers can access information about the options that area available to them and make comparisons.

Building code energy performance trajectory project.

Energy use in buildings accounts for almost one quarter of Australia's annual emissions, buildings account for more than half of Australia's electricity consumption. This paper argues that review of building codes, or the policies surrounding the building codes, are required to ensure that Australia meets its emissions reductions obligations.

The researchers gathered feedback from stakeholders as to minimum standards for sustainable buildings, and criteria on the selection of building standards.

Findings

The paper concludes that there are four specific elements that should be considered as we try to improve the energy efficiency of buildings. These are:

- Education and awareness of the proposed changes,
- Training to equip the industry with skills and knowledge to implement increasingly stringent energy efficiency regulations in practice,
- Increased transparency, through the use of certification or mandatory disclosure, and
- Improved enforcement of the building energy regulations.

The need for these specific elements of the campaign should be borne in mind when designing marketing materials targeting industry.

Retrieved from:
July 2017 Issues Paper, ASBEC & ClimateWorks Australia

Residential Housing Industry Capabilities – Analysis of Capability to support NSW and Victorian Government Energy Efficiency Policies and Programs.

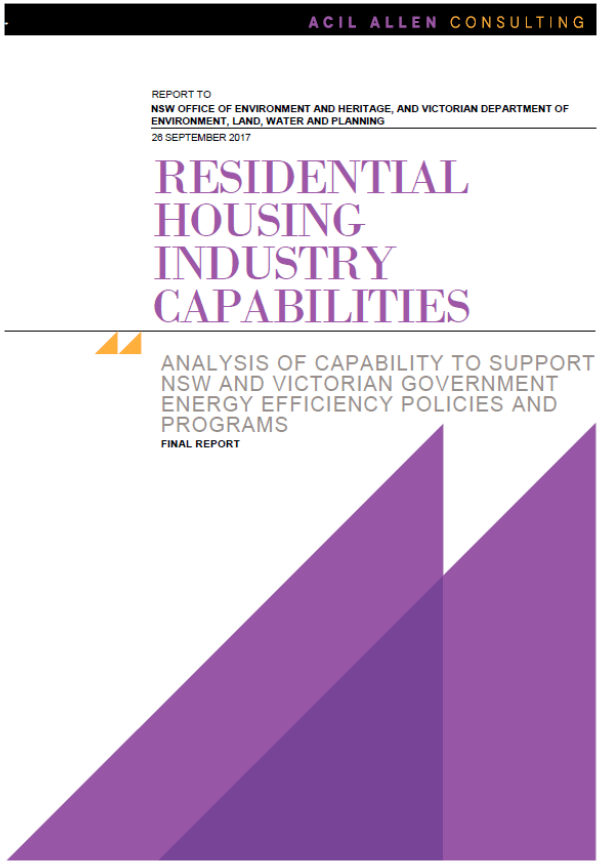
This study examined the housing supply chain and the current understanding of energy efficiency and the skills to develop sustainable homes.

Findings

The report concluded that there are many different actors involved in the supply chain that require consideration when encouraging builders to develop more sustainable homes. It highlighted that builders are driven by cost and focused on obtaining a competitive advantage.

Consequently, it argues regulation that covers the building supply chain, as well as the home builder, will be essential. The paper also referred to the importance of an education program for builders to increase their capacity to encourage buyers.

It also referred to the benefits of educating the public to drive demand for sustainable homes.

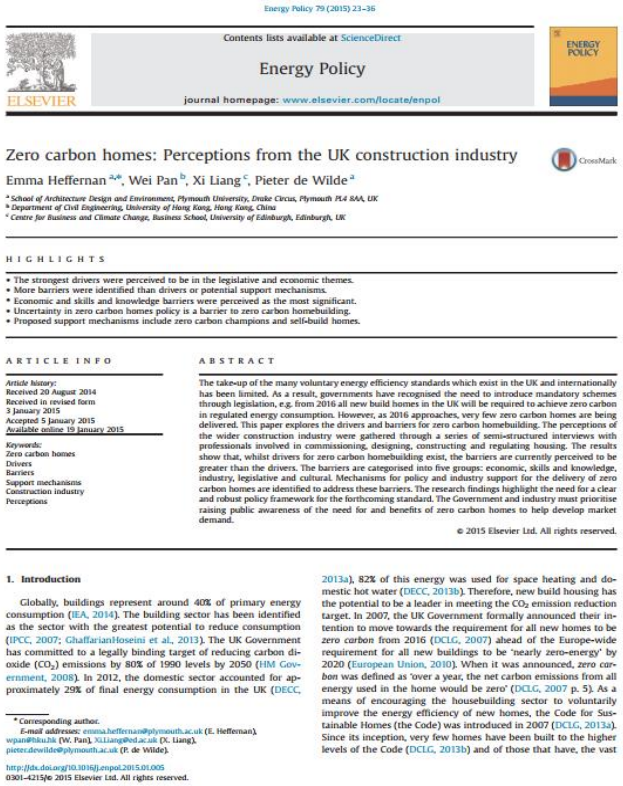


Zero Carbon Homes Perceptions from the UK Construction Industry.

This paper explored why the current adoption of voluntary energy efficiency standards within the UK has been minimal. This issue is set within the context that the government must implement mandatory legislation to achieve 2016 targets. To help address this issue the paper explored the drivers and barriers of building zero-carbon homes. Semi-structured interviews were conducted with professionals responsible for commissioning, designing, constructing and regulating housing.

Findings

- The paper concludes that the perceived barriers are outweighed by the perceived drivers of zero carbon homes.
- The stronger drivers for zero carbon homes are highlighted to be legislative (introduction of new legislation) and economic (that is reducing the cost of homes).
- Whereas the strong barriers include economic (the high cost of home), skills and knowledge, industry, legislative (existing policies) and cultural.
- The paper proposes mechanisms for policy and industry to mitigate the negative impact of barriers. The most important mechanisms include better education, training and awareness.
- While an increase in public awareness about the necessity and value of zero carbon homes is necessary, particularly in enhancing consumer demand. It is suggested that this could be achieved by introducing 'zero carbon champions' within organisations.



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Zero carbon homes: Perceptions from the UK construction industry

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HIGHLIGHTS

- The strongest drivers were perceived to be in the legislative and economic themes.
- More barriers were identified than drivers or potential support mechanisms.
- Economic and skills and knowledge barriers were perceived as the most significant.
- Uncertainty in zero carbon homes policy is a barrier to zero carbon homebuilding.
- Proposed support mechanisms include zero carbon champions and self-build homes.

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ABSTRACT

The take-up of the many voluntary energy efficiency standards which exist in the UK and internationally has been limited. As a result, governments have recognised the need to introduce mandatory schemes through legislation, e.g. from 2016 all new build homes in the UK will be required to achieve zero carbon in regulated energy consumption. However, as 2016 approaches, very few zero carbon homes are being delivered. This paper explores the drivers and barriers for zero carbon homebuilding. The perceptions of the wider construction industry were gathered through a series of semi-structured interviews with professionals involved in commissioning, designing, constructing and regulating housing. The results show that, whilst drivers for zero carbon homebuilding exist, the barriers are currently perceived to be greater than the drivers. The barriers are categorised into five groups: economic, skills and knowledge, industry, legislative and cultural. Mechanisms for policy and industry support for the delivery of zero carbon homes are identified to address these barriers. The research findings highlight the need for a clear and robust policy framework for the forthcoming standard. The Government and industry must prioritise raising public awareness of the need for and benefits of zero carbon homes to help develop market demand.

1. Introduction

Globally, buildings represent around 40% of primary energy consumption (IEA, 2014). The building sector has been identified as the sector with the greatest potential to reduce consumption (IPCC, 2007; GhaffarianHoseini et al., 2013). The UK Government has committed to a legally binding target of reducing carbon dioxide (CO_2) emissions by 80% of 1990 levels by 2050 (HM Government, 2008). In 2012, the domestic sector accounted for approximately 29% of final energy consumption in the UK (DECC, 2013a), 82% of this energy was used for space heating and domestic hot water (DECC, 2013b). Therefore, new build housing has the potential to be a leader in meeting the CO_2 emission reduction target. In 2007, the UK Government formally announced their intention to move towards the requirement for all new homes to be *zero carbon* from 2016 (DCLG, 2007) ahead of the Europe-wide requirement for all new buildings to be 'nearly zero-energy' by 2020 (European Union, 2010). When it was announced, *zero carbon* was defined as 'over a year, the net carbon emissions from all energy used in the home would be zero' (DCLG, 2007 p. 5). As a means of encouraging the housebuilding sector to voluntarily improve the energy efficiency of new homes, the Code for Sustainable Homes (the Code) was introduced in 2007 (DCLG, 2013a). Since its inception, very few homes have been built to the higher levels of the Code (DCLG, 2013b) and of those that have, the vast

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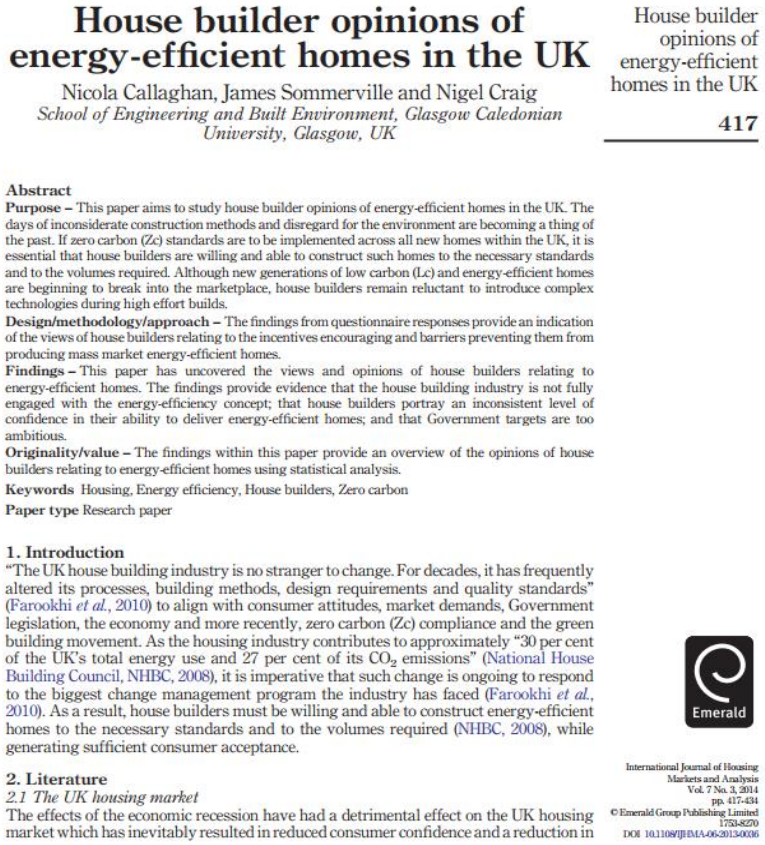
http://dx.doi.org/10.1016/j.enpol.2015.01.005
0301-4215/

House builder opinions of energy-efficient homes in the UK.

This quantitative study was designed to assess the opinions of house builders of energy efficient homes in the UK. The paper is prefaced with the knowledge that builders must be able and willing to build houses to adequate volumes and quality if zero carbon standards are to be widely implemented. Further, it established that there is varied confidence among builders in the energy efficient concept and their ability to deliver and meet targets.

Findings

- The research identified the barriers of energy-efficient homes to be a current lack of consumer demand, design issues, construction problems, use of new technology and increased costs.
- However, it recommended that builders could be encouraged to build more energy efficient homes through government incentives, increased consumer demand and increased energy efficiency. Further it was found that type of incentive affected level of effort.
- The study also concluded that the size of developers did not affect their decisions to build energy-efficient homes.



House builder opinions of energy-efficient homes in the UK

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Abstract

Purpose – This paper aims to study house builder opinions of energy-efficient homes in the UK. The days of inconsiderate construction methods and disregard for the environment are becoming a thing of the past. If zero carbon (Zc) standards are to be implemented across all new homes within the UK, it is essential that house builders are willing and able to construct such homes to the necessary standards and to the volumes required. Although new generations of low carbon (Lc) and energy-efficient homes are beginning to break into the marketplace, house builders remain reluctant to introduce complex technologies during high effort builds.

Design/methodology/approach – The findings from questionnaire responses provide an indication of the views of house builders relating to the incentives encouraging and barriers preventing them from producing mass market energy-efficient homes.

Findings – This paper has uncovered the views and opinions of house builders relating to energy-efficient homes. The findings provide evidence that the house building industry is not fully engaged with the energy-efficiency concept; that house builders portray an inconsistent level of confidence in their ability to deliver energy-efficient homes; and that Government targets are too ambitious.

Originality/value – The findings within this paper provide an overview of the opinions of house builders relating to energy-efficient homes using statistical analysis.

Keywords Housing, Energy efficiency, House builders, Zero carbon

Paper type Research paper

1. Introduction

"The UK house building industry is no stranger to change. For decades, it has frequently altered its processes, building methods, design requirements and quality standards" (Farookhi *et al.*, 2010) to align with consumer attitudes, market demands, Government legislation, the economy and more recently, zero carbon (Zc) compliance and the green building movement. As the housing industry contributes to approximately "30 per cent of the UK's total energy use and 27 per cent of its CO_2 emissions" (National House Building Council, NHBC, 2008), it is imperative that such change is ongoing to respond to the biggest change management program the industry has faced (Farookhi *et al.*, 2010). As a result, house builders must be willing and able to construct energy-efficient homes to the necessary standards and to the volumes required (NHBC, 2008), while generating sufficient consumer acceptance.

2. Literature

2.1 The UK housing market

The effects of the economic recession have had a detrimental effect on the UK housing market which has inevitably resulted in reduced consumer confidence and a reduction in

Emerald

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1753-8270
DOI 10.1108/IJHMA-06-2013-0036

From Thousands to Billions. Coordinated Action towards 100% Net Zero Carbon Buildings By 2050.

This report by the World Green Building Council (WorldGBC) flagged that the building and construction industry contributes 30% of global energy consumption and emissions. These industries are therefore key in reducing the carbon footprint. The report defined a ‘net zero carbon building’ to be a highly energy-efficient building where all remaining operational energy used comes from renewable energy. The report also indicated a preference for on-site energy production to achieve net zero carbon emissions annually in operation.

Findings

WorldGBC proposed two goals in this paper. The first, that all new buildings must operate at net zero carbon from 2030 and secondly that 100% of buildings must operate at net zero carbon by 2050.

WorldGBC then discussed how these goals can be achieved by making changes and strong calls to action from a variety of stakeholders within business, Government and Non-Governmental Organisations. It is assumed that through each of these stakeholders making positive action contributions, the market should respond to demand and increase supply. However, the WorldGBC does identify that slow adoption of net zero carbon buildings is due to perceptual, technical and financial barriers will be an ongoing issue in the future.

Retrieved from:
http://www.worldgbc.org/news-media/thousands-billions-coordinated-action-towards-100-net-zero-carbon-buildings-2050

What drives “green housing” construction? Evidence from Switzerland.

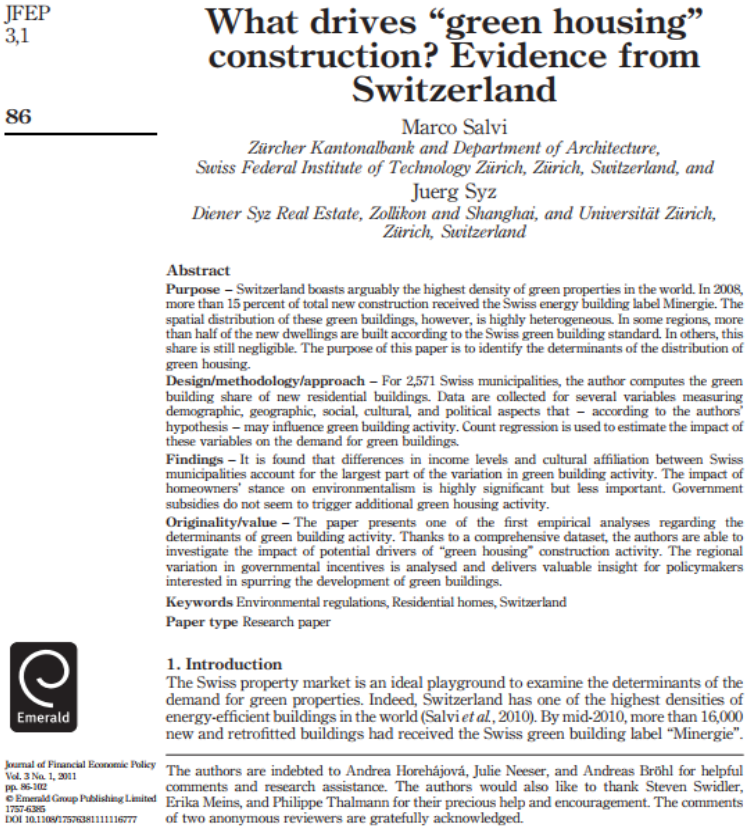
This article explored the heterogeneous nature of green housing throughout Switzerland and its contributing factors. It aims to assist policymakers to encourage green housing adoption. The paper tested six hypotheses to identify what drives green housing.

Findings

The paper ends with a number of conclusions, that though specific to Switzerland may have application outside of its borders:

- Variation in green buildings throughout suburbs was found to correlate with variations in income levels and cultural affiliation.
- A significant correlation existed between homeowners’ views on the environment and their willingness to build green houses, although this was not found to be as important as other factors.
- Interestingly, government subsidies were not found to influence green housing significantly in this case.

The paper concluded that green housing demand is likely low due to complex attitudes regarding both public and private aspects (e.g. improving the environment and improving the quality of builds).



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What drives “green housing” construction? Evidence from Switzerland

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Abstract

Purpose – Switzerland boasts arguably the highest density of green properties in the world. In 2008, more than 15 percent of total new construction received the Swiss energy building label Minergie. The spatial distribution of these green buildings, however, is highly heterogeneous. In some regions, more than half of the new dwellings are built according to the Swiss green building standard. In others, this share is still negligible. The purpose of this paper is to identify the determinants of the distribution of green housing.

Design/methodology/approach – For 2,571 Swiss municipalities, the author computes the green building share of new residential buildings. Data are collected for several variables measuring demographic, geographic, social, cultural, and political aspects that – according to the authors' hypothesis – may influence green building activity. Count regression is used to estimate the impact of these variables on the demand for green buildings.

Findings – It is found that differences in income levels and cultural affiliation between Swiss municipalities account for the largest part of the variation in green building activity. The impact of homeowners' stance on environmentalism is highly significant but less important. Government subsidies do not seem to trigger additional green housing activity.

Originality/value – The paper presents one of the first empirical analyses regarding the determinants of green building activity. Thanks to a comprehensive dataset, the authors are able to investigate the impact of potential drivers of “green housing” construction activity. The regional variation in governmental incentives is analysed and delivers valuable insight for policymakers interested in spurring the development of green buildings.

Keywords Environmental regulations, Residential homes, Switzerland

Paper type Research paper

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1. Introduction

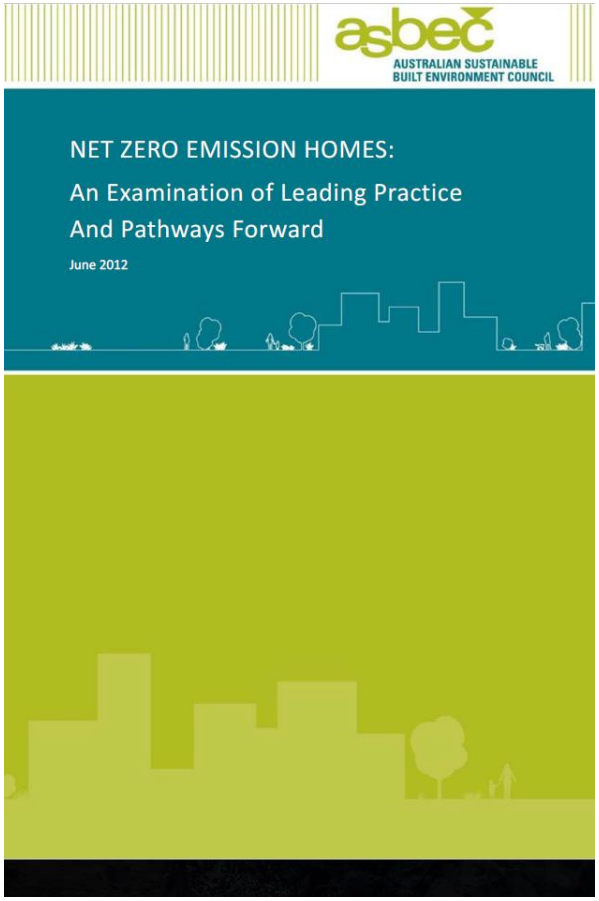
The Swiss property market is an ideal playground to examine the determinants of the demand for green properties. Indeed, Switzerland has one of the highest densities of energy-efficient buildings in the world (Salvi *et al.*, 2010). By mid-2010, more than 16,000 new and retrofitted buildings had received the Swiss green building label “Minergie”.

The authors are indebted to Andrea Horehájová, Julie Neeser, and Andreas Bröhl for helpful comments and research assistance. The authors would also like to thank Steven Swidler, Erika Meins, and Philippe Thalmann for their precious help and encouragement. The comments of two anonymous reviewers are gratefully acknowledged.

Net Zero Emission Homes: An Examination of Leading Practice and Pathways Forward.

This study was designed to:

- Document and assess leading Australian and international practice in the delivery of net zero carbon homes,
- Assess the applicability of international initiatives in the Australian context,
- Present international and domestic case studies of homes that will contribute to the goal of making zero carbon homes mainstream, and
- Make recommendations on a pathway towards zero carbon homes in Australia by 2020.



Findings

The paper found that in order to encourage builders to make their homes more sustainable, it is recommended that targets for achieving zero carbon homes are agreed with industry and allocated timelines. However, it also mentioned that these should be complemented with voluntary standards.

A rating system for sustainable homes, that is audited consistently and comprehensively is also required.

For buyers, incentives should be used to reduce the burden of lengthy payback periods on the benefits of sustainable homes.

Buyers also need to better understand the benefits of zero carbon homes, for example via a recognisable brand and logo; awards programs; and targeted communications.

Retrieved from:
ASBEC June 2012, Institute for Sustainable Futures, University of Technology, Sydney, Authors: Chris Riedy, Aleta Lederwasch and Steve Harris

Critical factors affecting the implementation of sustainable housing in Australia.

This research aimed to develop a hierarchical framework of the factors that are likely to influence the introduction of sustainable housing in Australia. The research consisted of both quantitative and qualitative methods. The quantitative phase included a survey of n=80 organisations that had a strong focus on sustainability, this information was then explored further in a series of semi-structured interviews.

Findings

The model produced by the research identifies twelve critical factors that affect implementation of sustainable houses. However, above all else its is recommended that a clear reward system is developed between the government and developers.

The author also calls government agencies and housing industry practitioners to work together and develop coherent strategies to produce a solution to the problem.

Critical Factors Affecting the Implementation of

Sustainable Housing in Australia

Abstract: Improved public awareness of the environment and available technologies will continue to highlight the importance of sustainable housing in the coming years. Despite this potential, the majority of new housing development in Australia is still "project homes" with few tangible sustainability measures. Stakeholders tend to have different perceptions and priorities on sustainability. To promote the uptake of sustainable housing products, a study of the critical issues affecting the implementation of sustainable housing is necessary. This research investigates multiple factors that may influence key stakeholders' decision-making towards sustainable housing adoption. Drawing insights from combined questionnaire and interview studies, 12 critical factors and their interrelationships are identified based on professional views in the Australian housing industry. The mutual influences, or driving force and dependency, of these factors are further investigated via Interpretive Structural Modelling (ISM) to distinguish those requiring prominent and immediate attention. A hierarchical model is developed to help key stakeholders prioritise actions when implementing sustainable housing.

Key words: sustainability; housing; framework; factors; mutual influence; Australia

Introduction

The Australian housing industry needs to respond to environmental sustainability. For a 67% chance of keeping global warming within 2 degrees above pre-industrial temperatures, research has indicated that it would be necessary for Australia to de-carbonise its economy by 2020 (Melbourne Energy Institute, 2010). Since the construction and housing sector alone accounts for over 11% of all carbon emissions in 2011 (Commonwealth of Australia 2013), industry practitioners are under pressure to deliver sustainable housing products acceptable by the general market.

Despite the potential benefits and technological viability, voluntary up-take of sustainable housing is still in its infancy in Australia mostly driven by motives of experimentation, showcasing and marketing. For example, the Green Building Council of Australia developed a voluntary approach, *Green Star - Multi Unit Residential*, to benchmark sustainable housing development in terms of eight areas of sustainability including energy, indoor environment quality and emissions. Among hundreds of housing development projects, only a modest 17 were endorsed as 4-star or above (GBCA, 2011). Similarly, only 33 projects across Australia have been certified as being developed in a sustainable

1 / 20

The QBE Australian Housing Outlook 2017-2020.

This report provided a three year outlook on the Australian housing market and the key drivers influencing it. The report is prefaced by explaining the changing landscape of new builds, shifting from detached houses to smaller units and apartments.

Findings

Most relevant to the current study are statistics pertaining to Victoria's growth in the housing sector including:

- The record 11.8% population growth in the state which is leading to strong demand for properties,
- Rising house prices are expected to strain affordability, leading to reduced first home buyer activity whereas more sales are predicted for those upgrading or downsizing,
- In the near future median house prices are expected to grow 6% in 2017/18, while looking further ahead the outlook for Victoria predicts a median house price of $940,000 by June 2020.

The changing demographics and reasons for home sales will be important considerations when considering any program targeting home builders and buyers in the future.

Retrieved from:
https://www.qbe.com.au/campaigns/housing-outlook