

GROWING THE MARKET FOR SUSTAINABLE HOMES



**INDUSTRY
ROADMAP**



**LOW CARBON LIVING
CRC**

asbec

AUSTRALIAN SUSTAINABLE
BUILT ENVIRONMENT COUNCIL



FOREWORD

The homes we build today must meet the needs of tomorrow.

As we work towards a global goal of zero net emissions by 2050, Australia's home building sector faces a monumental challenge.

Our homes already produce around 13 per cent of Australia's greenhouse gas emissions. If our population continues to grow at its current rate, to an estimated 31 million people by 2030, we will need to construct as many as 197,000 homes a year. Whether these homes help or harm our planet is up to us.

Sustainable homes require less energy to heat and cool, enhance occupant comfort and are more resilient to climate and weather extremes.

Sustainable homes can also be a driver for economic growth. Preliminary economic modelling undertaken by the CRC for Low Carbon Living and ASBEC has found that accelerating Australia's transition to sustainable housing would deliver more than half a billion dollars of extra investment in the construction industry by 2030 and create over 7,000 new jobs. It would also save Australians \$600 million on their energy bills.

These are big opportunities. But we have found several significant challenges that must be overcome first. Consumers are unclear of their choices – and are baffled by the terminology that describes sustainable features and technologies. Home builders are locked into business models and supply chains that limit innovation. And financiers don't value sustainable homes.

The CRC for Low Carbon Living and ASBEC have worked with industry partners and government to identify what's needed to grow a thriving market for better quality, sustainable and liveable homes.

We have developed this 'Sustainable Homes Transition Roadmap' to accelerate action, with four clearly defined steps: differentiate sustainable housing in the market; train and reward the construction industry; build awareness; and broadcast the positive business case.

Australia's world-leading approach to sustainability in the commercial sector underscores the opportunity. We have the skills, knowledge and technologies at our disposal. Now we must create the right policies and incentives to help Australian consumers capture the benefits of sustainable homes.

Prof. Deo Prasad
CRC for Low Carbon Living

TABLE OF CONTENTS

Executive summary	4
1. Introduction	9
2. Key partners	11
2.1. The Collaborative Sustainable Housing Initiative (CSHI)	11
2.2. Australian Sustainable Built Environment Council (ASBEC)	11
2.3. The Low Carbon Living Cooperative Research Centre	11
3. Vision	12
3.1. What is a sustainable home?	14
3.2. Understanding consumer demand	14
3.2.1. Information complexity	14
3.2.2. Language and message framing	15
3.2.3. Information sources	15
3.2.4. Summary: Vision for reaching consumers	16
3.3. Supply chain considerations	16
3.3.1. Volume home construction	17
3.3.2. Bespoke construction and renovation	17
3.3.3. Other key industry influencers	19
3.3.4. Summary: Mobilising the supply chain	20
4. Industry priorities for growing the market for sustainable homes	21
5. Construction industry economic benefits and business case	23
5.1. Market potential	23
5.2. Costs and benefits	24
5.3. Economic impact	25
6. A proposed Sustainable Homes Transition Roadmap	26
7. Implementing the Sustainable Homes Transition Roadmap	28
8. Appendix A: Case studies	29
8.1. Renovate or Rebuild	29
8.2. Zero Net Carbon Homes pilot program	29
9. Appendix B	30
10. References	31

EXECUTIVE SUMMARY



Defining the sustainable home

This Roadmap uses the term 'sustainable home' as 'short-hand' for low-energy, zero-energy and zero-carbon ready, but also includes the concepts of healthy and resilient buildings. A sustainable home is one that requires less energy to heat and cool, and so is cheaper to run. A sustainable home also enhances occupant comfort and is resilient to climate and weather extremes. While we use the term 'sustainable home' here to avoid confusion, the Roadmap recommends that a clear definition is agreed in partnership with industry and government to achieve long-term consistency.

The opportunity

Improving the energy efficiency of our buildings is squarely in the sights of governments around Australia.

Homes currently generate around 13 per cent of Australia's greenhouse gas emissions. As our population grows to an estimated 31 million people by 2030, emissions from homes will continue to rise unless we take collective action.

In February 2019, Australia's energy ministers committed to a *Trajectory for Low Energy Buildings* – a national plan that sets a pathway towards zero energy and carbon ready buildings. As part of this plan, the Australian Building Code Board is looking to strengthen the energy efficiency provisions in the National Construction Code, for new residential and commercial buildings, from 2022. It is also considering options to improve existing buildings in late 2019.

A 'step change' in the National Construction Code energy efficiency provisions for commercial buildings has already occurred – the first of numerous changes locked in under the Trajectory, which will include both commercial and residential buildings.

While there is a clear climate imperative, there is also an untapped market for sustainable homes and an economic opportunity for the construction industry. New evidence finds that a transition to sustainable homes can deliver positive economic benefits to the Australian economy. Preliminary economic modelling undertaken by ASBEC and CSIRO has found that investing in voluntary measures to accelerate Australia's transition to sustainable homes by 2030 would:

- Deliver more than half a billion dollars of extra investment in the construction industry
- Create over 7,000 new jobs
- Save Australians more than \$600 million on their energy bills.

Australia's commercial building sector leads the world in sustainability, demonstrated in eight years at the top of GRESB, the global real estate sustainability benchmark. There is also potential for the residential sector to deliver higher performing buildings.

Some Australian home builders are already striving to move beyond minimum requirements by incorporating energy efficient designs and technology innovations into new homes that are healthier, more comfortable and more affordable to run. However, these builders lack scale and face significant barriers. Consumers are unclear of their choices – and are baffled by all the terminology. Home builders are locked into business models and supply chains that limit innovation. And financiers don't value sustainable homes.

This roadmap offers a golden opportunity to proactively address these challenges and achieve a smooth regulatory transition through complementary market-based support. Research shows that this can create a win-win outcome for builders, consumers, the economy and the environment.



The potential market

Research shows that Australian consumers want sustainable homes – they just don't use the word 'sustainability' when describing their desires.

Australians talk about finding a home that is comfortable, is a healthy place for their family and is affordable – all things that a sustainable home can deliver. Meeting these aspirations can lead to demonstrated increases in property value. Research has confirmed, for example, that homes with solar panels and high environmental ratings now attract a price premium.

Despite the benefits of sustainable homes, consumers are confused by the terminology and by the lack of useful information. While the narratives around sustainable homes often focus on highly technical or economic information, consumers are more drawn to human stories like those told on TV shows, like *The Block*. This absence of appropriate information, together with the plethora of rating systems, leads to uncertainty among new home buyers and renovators, impeding their ability to choose wisely from the host of products and suppliers on the market. The disparity between consumer aspirations and product availability indicates a clear market failure, resulting in higher energy bills, poorer health outcomes and reduced quality of life.

New research, by CSIRO under the auspices of the CRC for Low Carbon Living, indicates that two thirds of home buyers prefer energy efficient homes when given a choice. This research found that the floor plans with additional 'sustainability' features have, on average, 8.6 per cent higher purchase preference than the standard version of the same design. This highlights a massive but currently untapped market for sustainable homes.

"Two thirds of home buyers prefer energy efficient homes when given a choice."

The supply chain

Home builders are the frontline of sustainable construction, whether that's new buildings or major renovations, and whether attached, detached or multi-storey apartments. Volume builders, who construct 40 per cent of new detached homes, have great potential to embed sustainability attributes into their standardised home packages and thereby transition the industry at scale.

Investment decisions about sustainable technologies are often made by building companies rather than individual home buyers. Discounts for volume purchasing, together with lock-in to supply chains, reduce the incentive for innovation.

Bespoke homes and renovations tend to involve smaller construction companies. Clients rely on these companies and tradespeople as important sources of information and advice. However, these builders have tight project budgets and timelines, which limit their ability to innovate on individual homes.

Identifying sustainable homes is also difficult for the finance industry, leading to conservative valuations and artificial caps on lending.

Research confirms a supply chain locked into structures that severely limit the support and growth of a new sustainable housing market.





A thriving market

Currently, consumers have limited choices, while the residential construction industry has assumed that sustainability is a cost burden rather than a market opportunity. This is unfortunate, because a growing market for sustainable housing has the potential to stimulate jobs and economic growth.

Research undertaken by the Housing Industry Association found that every \$1 million of construction output creates nine construction jobs, seven additional jobs in the supply chain, and \$2.9 million in economic value across the economy.

A thriving sustainable housing market would support each stakeholder group:

- **Consumers** would appreciate and talk about the value of sustainable homes
- **Finance industry** would offer increased lending limits and targeted products with access to financial instruments such as green bonds
- **Real estate agents** and land developers would sell liveability and other sustainability features to increase the market's appetite
- **Construction companies** would have access competitive supply chains for high performance products and services.

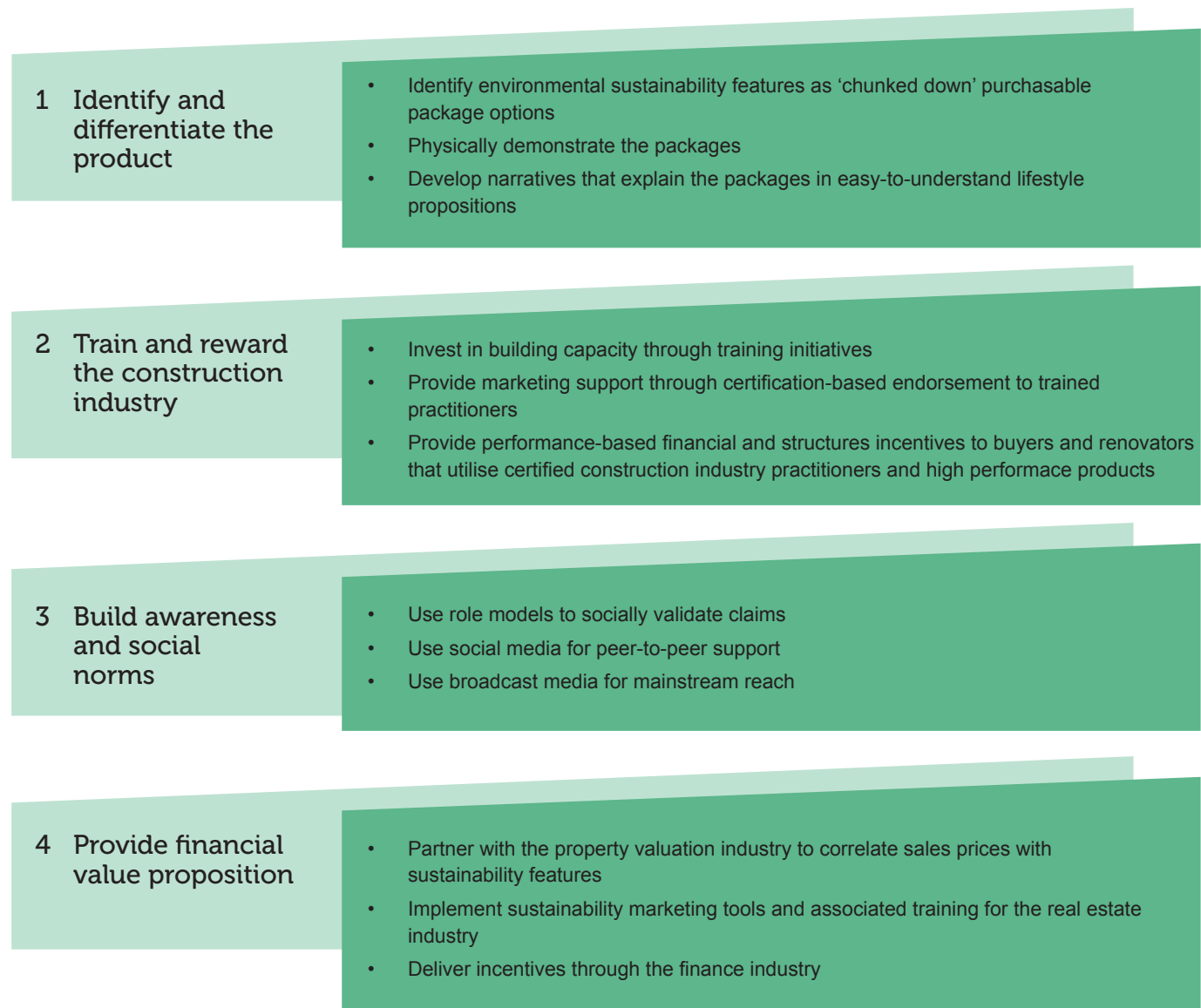
Getting there

Australia's energy ministers have agreed to set a *Trajectory for Low Energy Buildings*, which will strengthen energy efficiency provisions in the National Construction Code.

However, the agreed trajectory must be supported with a broad suite of voluntary measures, including consumer engagement, training, certification and financial levers.

We propose a 'Sustainable Homes Transition Roadmap' to engage consumers and to enable the construction industry to innovate. The proposed Roadmap outlines measures that demonstrate value to consumers in a new way, using visual media, social media and stories focused on social values and lived experience. The Roadmap also supports construction industry players to grow their capacity and skills to satisfy the need for new jobs in this market.

The four steps of the Roadmap are illustrated below.



Executing the Roadmap can meet multiple objectives. Consumers will own sustainable homes that are cheaper to run, more comfortable and healthier to live in. The building industry will access new sources of finance, grow jobs and enhance its skills while staying ahead of regulation. And government and industry will deliver the deep emissions cuts needed to meet our targets outlined in the Paris Agreement while reducing the strain on our energy infrastructure.

Key actions to grow the market for sustainable homes

Successful delivery of this industry-backed Sustainable Homes Transition Roadmap will require political commitment and coordinated leadership between the federal, state and territory governments working in collaboration with the home building sector. Key actions to advance this Roadmap are:

- 1. National commitment to a voluntary pathway for sustainable homes:** Australian federal, state and territory governments to prioritise a voluntary pathway for sustainable homes and work together to establish and resource an entity to oversee activities outlined in the Roadmap.

This entity would work in partnership with Australia's property and construction industry to deliver the actions outlined below to:

- Establish an agreed definition for sustainable housing that resonates with consumers
 - Improve coordination of initiatives to avoid consumer confusion, duplication and fragmentation
 - Facilitate commercially-focused activities.
- 2. Certification and training:** Create benchmarks that support the new definition of sustainable homes and upskill the building sector to implement these benchmarks. Steps would include:
 - Establish a standard for new best practice sustainable homes
 - Develop a certification program and training for the home building sector
 - Work with relevant state and territory agencies to establish an energy efficiency disclosure scheme for existing homes
 - Support training for real estate agents, volume builders and land developers to deliver a sales narrative that underscores the benefits of sustainable homes.
 - 3. Pilot program:** Spearhead a 1,000-home pilot program that incentivises volume builders to deliver sustainable homes. The results of the pilot program would be used to:
 - Validate the sustainable home standard
 - Support training and accreditation of early industry adopters
 - Uncover the personal stories of homeowners and tradespeople participating in the pilot program, and deliver media collateral to support mass media consumer engagement
 - Assess the need for any subsequent government program for ongoing incentives to complete the market transformation.
 - 4. Consumer engagement campaign:** Develop and deliver a longitudinal consumer engagement campaign – including programming in mainstream broadcast media, social media and commercial product placement – to accelerate the adoption of sustainable homes and support early adopters to enter the market at scale.
 - 5. Finance:** Engage with the finance sector to:
 - Enforce basic quality standards and seek disclosure of ratings for loan approvals
 - Embed sustainability features into property valuation methods and concomitant lending limits
 - Deliver lower cost finance for high performing homes.



1. INTRODUCTION



Improving the energy efficiency of our buildings is squarely in the sights of governments around Australia.

Our homes currently generate around 13 per cent of Australia's greenhouse gas emissions¹. As our population grows to an estimated 31 million people by 2030², emissions in our homes will continue to rise unless we take collective action.

In February 2019, Australia's energy ministers committed to a *Trajectory for Low Energy Buildings* – a national plan that sets a pathway towards zero energy and carbon ready buildings.

As part of this plan, the Australian Building Code Board is looking to strengthen the energy efficiency provisions in the National Construction Code, for new residential and commercial buildings, from 2022. It is also considering options to improve existing buildings in late 2019.

A 'step change' in the National Construction Code energy efficiency provisions for commercial buildings has already occurred – the first in numerous changes locked in under the Trajectory, which will include both commercial and residential buildings.

While there is a clear climate imperative, there is also an untapped market for sustainable homes and an economic opportunity for the construction industry. New evidence finds that a transition to sustainable homes can deliver positive economic benefits to the Australian economy. Preliminary economic modelling undertaken by ASBEC and CSIRO has found that investing in voluntary measures to accelerate Australia's transition to sustainable homes by 2030 would:

- Deliver more than half a billion dollars of extra investment in the construction industry
- Create over 7,000 new jobs
- Save Australians more than \$600 million on their energy bills.

Australia's commercial building sector leads the world in sustainability, demonstrated in eight years at the top of GRESB, the global real estate sustainability benchmark. There is potential for the residential sector to similarly deliver higher performing buildings.

Some Australian home builders are already striving to move beyond minimum requirements by incorporating energy efficient designs and technology innovations into new homes that are healthier, more comfortable and more affordable to run. However, these builders lack scale and face significant barriers. Consumers are unclear of their choices – and are baffled by all the terminology. Home builders are locked into business models and supply chains that limit innovation. And financiers don't value sustainable homes.



1 ASBEC, *Low carbon, high performance*, 2016.

2 HIA, *Housing Australia's future*, 2018.



This roadmap offers a golden opportunity to proactively address these challenges and achieve a smooth regulatory transition through complementary market-based support. Research shows that this can create a win-win outcome for builders, consumers, the economy and the environment.

Home builders are the frontline of sustainable construction, whether that's new buildings or major renovations, and whether attached, detached or multi-storey apartments. Volume builders, who construct 40 per cent of new detached homes, have great potential to embed sustainability attributes into their standardised home packages and thereby transition the industry at scale.

As we gear up for impending regulatory changes, Australia should aim for a win-win for the home construction sector, and a smooth transition to better quality, more affordable homes. For this to happen, builders must be incentivised and empowered to voluntarily engage in the sustainable housing market, rather than wait for regulation. At the same time, we must equip consumers to understand the benefits of sustainable homes to build a thriving market.

The CRC for Low Carbon Living and ASBEC have worked with their members and key partners to develop this Roadmap that voluntarily moves the housing market towards a more sustainable future. It is based on work from the Collaborative Sustainable Housing Initiative (CSHI) and research from the CRC for Low Carbon Living. Research presented in this paper is primarily focused on detached dwellings, but many of the findings are applicable to apartments.

Recent research has found sustainable homes could have more widespread appeal and latent market potential than previously thought. Extensive industry deliberation, through the CSHI, has identified a strong desire within parts of the property and construction industry to activate this market, and to harvest potential commercial and economic growth opportunities. However, significant barriers remain that prevent widespread industry adoption.

The focus on homes is broad in scope and covers greenhouse gas emissions, thermal comfort, resource efficiency and resilience. It is also focused on market-led measures that can deliver above minimum standards. A market-led approach to increase voluntary consumer demand and awareness is complementary with proposed regulatory action.

In this context, this Roadmap aims to inform the next wave of industry investment and government policy.

2. KEY PARTNERS

2.1. The Collaborative Sustainable Housing Initiative (CSHI)

The Collaborative Sustainable Housing Initiative (CSHI) was launched in 2014 by the NSW Office of Environment & Heritage (OEH). Its purpose was to address systemic barriers to the supply and demand of sustainable housing features such as passive housing design, insulation, double glazing, solar energy, water saving devices and sustainable materials.

The CSHI supported a co-creation process with industry stakeholders to define the core problems, identify solutions and then collectively implement targeted interventions. OEH acted as a backbone facilitator to help industry own, coordinate and solve its own problems using the principles of 'collective impact'. More than 80 organisations participated in the CSHI (Appendix B), with representation from all major stakeholders in the housing market.

The CSHI process identified the key industry dilemma: "How do we create mainstream demand for quality homes that are comfortable and healthier to live in, are affordable, and have a positive impact on our environment?"

On the one hand, this is a marketing problem requiring consumers to understand the value of sustainable homes and their choices. On the other hand, it is also a supply chain problem requiring competitive sourcing and mainstream availability of sustainable products and services. Such a multi-faceted, or 'wicked', problem is well suited to the 'collective impact' approach.

Through the whole-of-industry CSHI deliberation, consensus was reached on areas where action can unlock the market for environmentally sustainable housing.

2.2. Australian Sustainable Built Environment Council (ASBEC)

ASBEC is the peak body of key organisations committed to a sustainable built environment in Australia. ASBEC's 50-plus member and observer organisations includes industry and professional associations, non-government organisations and government agencies.

A non-profit volunteer organisation, ASBEC represents the majority of stakeholders involved in the planning, design, delivery and operation of Australia's built environment.

ASBEC members commit their time, resources and energy to task groups that identify and advocate specific practical opportunities that can accelerate Australia's transition to a sustainable built environment. This Roadmap is an initiative of the Sustainable Housing Task Group. It builds on past work on residential rating systems³, which recommends three levels of ratings covering:

- Minimum standards for new houses
- Quantitative benchmarking of existing homes
- Qualitative appraisal narratives for consumers.

ASBEC also established a policy roadmap in 2016, through the *Low Carbon, High Performance* report, which outlines a pathway to achieve carbon emissions reductions across Australia's built environment⁴.

2.3. The Low Carbon Living Cooperative Research Centre

The Low Carbon Living Cooperative Research Centre is a national research and innovation hub that seeks to enable a globally competitive low-carbon built environment sector. The LCLCRC has supported numerous research projects that aim to better understand consumer preferences for low-carbon housing features and the communication techniques that will resonate with consumers. The research has found high levels of synergy between sustainable housing benefits and the underlying aspirations of home buyers. However, a lack of popular narrative or vocabulary prevents consumers from engaging with sustainable homes.

3 ASBEC, *A National Framework for Residential Ratings: Policy Platform*, 2015 and *A National Framework for Residential Ratings: Discussion Paper*, 2015.

4 ASBEC, 2016.

3. VISION

The CSHI identified an agreed vision to:

“Create mainstream demand for quality homes that are comfortable and healthier to live in, are affordable, and have a positive impact on our environment.”

This vision aims to develop a mainstream market for homes that are differentiated by their superior environmental performance. This will, in turn, grow construction industry jobs and revenue, as home buyers and renovators invest more in the construction of higher quality homes.

Despite support for this vision, prevailing industry opinion is that this market does not currently exist, and that consumers are unaware or do not value the benefits of sustainable housing features.⁵ However, a significant body of research now exists which has found that Australian home buyers and renovators value energy efficiency and environmental sustainability – they just don’t use the word ‘sustainability’ when describing their desires.^{6,7} Virtually all studies draw a positive correlation between better energy performance and increased property values.^{8,9}

Research^{10,11} has found a substantial latent desire for the ‘co-benefits’ of sustainable housing, including:



Comfort: A thermally efficient house stays naturally warm in winter and cool in summer, maintaining even temperatures inside the occupied space without artificial air-conditioning. Good design also enhances natural daylight.



Health: Around 6.5 per cent of deaths in Australia are attributed to cold weather, and 0.5 per cent from hot weather.¹² Mild temperatures inside the home provide protection from a range of temperature-related illnesses. Appropriately ventilated houses also minimise pollutants such as volatile organic compounds. Environmentally-sustainable precincts provide local amenities, greenspace and infrastructure that encourages walking and healthy, active lifestyles.



Community: When embedded in walkable local communities, sustainable homes minimise the need for travel, especially by car, which reduces emissions, enhances health and wellbeing, and fosters a sense of belonging.



Affordability: A whole-of-life approach values both reduced running costs and increased resale value.

These co-benefits could form the basis of a national consumer engagement campaign. However, no organisation has successfully executed a market transformation strategy that taps into this latent opportunity.

Despite the benefits of sustainable homes, consumers are confused by the terminology and by the lack of useful information. While the narratives around sustainable homes often focus on highly technical or economic information, consumers are more drawn to human stories like those told on TV shows, like *The Block*. This absence of appropriate information, together with the plethora of rating systems, leads to uncertainty among new home buyers and renovators, impeding their ability to choose wisely from the host of products and suppliers on the market. The disparity between consumer aspirations and product availability indicates a clear market failure, resulting in higher energy bills, poorer health outcomes and reduced quality of life.

5 Low Carbon Living CRC, *Working paper 4 - Housing Specialist and Real Estate Industry Survey*, 2015.

6 Houzz, *Houzz & Home: Overview of Australian Renovation, Custom Building & Decorating in 2014*, 2015.

7 Romanach et al, *EnergyFit Homes Initiative working paper 3: National consumer survey results*, 2015.

8 International Partnership for Energy Efficiency Cooperation, *Building Energy Rating Schemes: Assessing Issues and Impacts*, 2014.

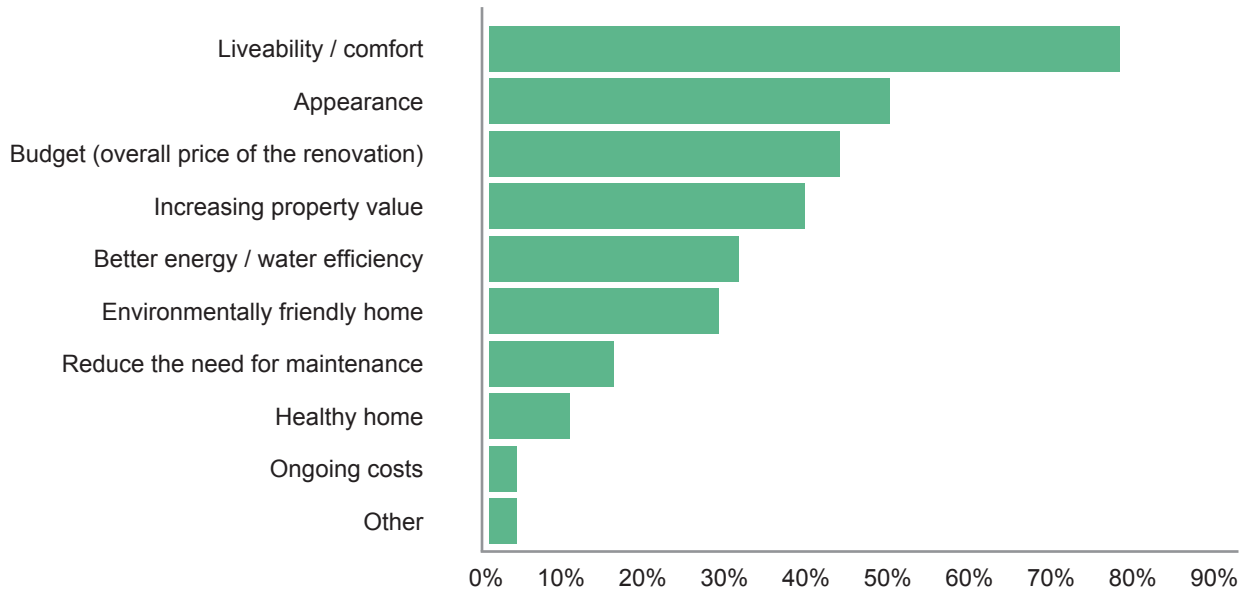
9 Warren-Myers et al, *Sustainability ratings in residential development: a worthwhile endeavour?*, 2018.

10 Hulse et al, *I'd just Google it: media and home renovation practices in Australia*, 2015.

11 Instinct and Reason, *Connecting comfort to energy efficiency and sustainability*, 2014.

12 Gasparrini et al, *Mortality risk attributable to high and low ambient temperature: a multi-country observational study*, 2015.

Figure 1: Comfort and livability as a high priority for home buyers



Source: Hulse et al, 2015.

New research, undertaken by CSIRO, indicates that two thirds of home buyers prefer energy efficient homes when given a choice. This research found that the floor plans with additional ‘sustainability’ features have, on average, 8.6 per cent higher purchase preference than the standard version of the same design. This highlights a massive but currently untapped market for sustainable homes.

Creating demand for sustainable homes requires a consumer-centred, market-based approach. This is explored in the following subsections by first understanding the consumer drivers and pain points, and then identify how existing industry structures can adapt and benefit from increased demand for sustainable products and services.

Figure 2: Divided on healthy, green and smart homes

Renovation Consideration	Importance of renovation considerations among home owners who renovated		
	Average importance rating	Very/extremely important	Not at all important
Improving design look and feel	9	89%	0%
Improving functionality	8.8	85%	1%
Increasing resale value	7.9	67%	6%
Improving energy efficiency	7.6	60%	5%
Minimising costs	7.5	55%	4%
Integrating green / sustainable materials	6.4	36%	12%
Preventing or addressing health concerns	6.1	39%	23%
Integrating smart technology	4.9	18%	32%

Source: Houzz, 2015.

3.1 What is a sustainable home?

A wide variety of systems, rating schemes and tools help to define certain aspects of a sustainable home. Some are quantitative, covering measurable components such as energy or water consumption. Some are more qualitative and holistic. Some are evaluated at the design stage, and some are evaluated once occupants are living in the home. Some sustainability parameters have multiple co-benefits, such as improved health and amenity outcomes.

In other cases, technology features – notably solar panels – are marketed as a definitive ‘sustainable’ initiative regardless of whether this feature is the most efficient and thermally-comfortable option for that particular home.

The wide range of definitions has created confusion in the minds of consumers. Issues and opportunities to align rating systems are discussed in ASBEC’s *National Framework for Residential Ratings Policy Platform*.¹³

Rather than attempt to define a sustainable home in this Roadmap, we believe this should be worked out in partnership with industry and government to achieve consistency and minimise consumer confusion. This work should consider multi-dimensional frameworks which could incorporate existing methodologies such as NatHERS, BASIX, Liveability Real Estate and the Green Building Council of Australia’s Green Star and Future Homes. For consistency with COAG Energy Council directions, the energy component of the definition should address thermal performance of the building fabric to deliver comfort and resilience, as well as energy usage by fixed appliances.

3.2 Understanding consumer demand

3.2.1 Information complexity

A growing body of research has confirmed that consumers are confused by the complexity of sustainability terms and what they promise to deliver.

Some valuable insights can be gleaned from Colmar Brunton’s *Sustainability Victoria renovations research report* which found that consumers prioritise “sustainability” (81%) and “energy efficiency” (89%) as important considerations in the planning stages of a renovation.¹⁴ However, these priorities are often ‘crowded out’ by competing considerations during the renovation journey. These included:

- Perceived cost barriers and cost trade-offs
- Retaining original or period features
- Compromising lifestyle
- Renovation or decision-making fatigue
- Meeting time pressures.

Consumers prioritise “sustainability” (81%) and “energy efficiency” (89%) as important considerations in the planning stages of a renovation.



Colmar Brunton’s research also found that energy efficient lighting and insulation were relatively well-recognised features, but consumers were unlikely to consider other available sustainability solutions. This suggests possible information gaps, despite the abundance of information already available on the internet.

This gap between the availability of quality information, and how it is applied, suggests that consumers find it difficult to choose from the diversity and complexity of technology options and recommended behaviours. In response, buyers and renovators tend to seek decision-making shortcuts. These may include withdrawal or deferring to government to ‘solve the problem’.

Rather than responding with yet more information, and further cognitive overload, researchers suggest a behavioural economics approach would simplify and make desired actions easier, quicker and more convenient – indeed, by making sustainable options the default position. This would minimise the physical and psychological demands needed to perform the action and reduce perceived uncertainty.¹⁵

13 ASBEC, 2015.

14 Colmar Brunton, *Sustainability Victoria renovations research report*, 2013.

15 Frederiks et al, *Household energy use: Applying behavioural economics to understand consumer decision-making and behaviour*, 2015.

A report for the CRC for Low Carbon Living, *I'd just Google it: media and home renovation practices in Australia*, found that visual media is vital.

Renovators want to see design layouts, features, appliances and colours, rather than read text. This report emphasises that online platforms and apps that share visual content are increasingly important in the early stages of decision making, with Houzz, Pinterest and Instagram singled out for mention.

The *Framework for a community engagement for the built environment* also recommends that any energy efficiency engagement strategy should “make it easy via demonstration, and [by] chunking the desired behaviours down”.¹⁶

3.2.2 Language and message framing

The language of ‘energy efficiency’ may appeal to the people at the money-saving level, but it also evokes the spectre of sacrifice. Research confirms this, notably in OEH's report, *Connecting comfort to energy efficiency and sustainability*.¹⁷ It is no surprise, that when using the language of energy efficiency in its surveys, Colmar Brunton attributed consumers’ main motivation for implementing energy efficiency initiatives as “saving money on the operational costs of living”.¹⁸

Unfortunately, energy cost savings appear to be a relatively weak motivation when compared with other lifestyle considerations. The CRC for Low Carbon Living, for example, found that home renovators are typically juggling pragmatic factors – such as time, money and resale value – with emotional factors, like creating a family home and forming a strong attachment to place.¹⁹ Payback times and returns on investment are less important considerations for homeowners than they are for commercial building decision-makers. This work emphasises the importance of connecting consumers through human stories.

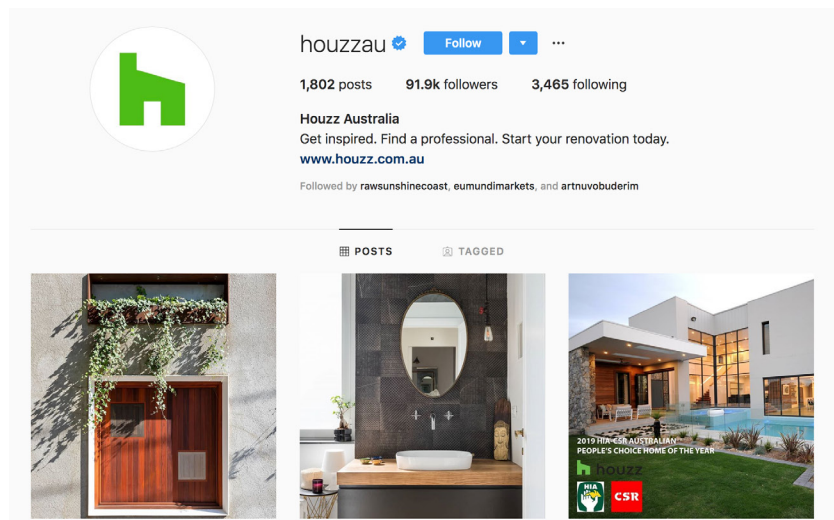
Similarly, the *Framework for a community engagement for the built environment* finds that people react to narratives rather than data.²⁰ This proposed framework aims to “make people believe others are already acting in sustainable ways”. A story-telling approach, emphasising the lifestyle co-benefits of environmental sustainability, is likely to be more effective than providing authoritative technical information.

3.2.3. Information sources

A wide range of research has investigated how and where home buyers and renovators source information and inspiration for their purchases.²¹ In the planning phase, renovators use the internet and other visual media to search for ideas. They also tap into social networks, including friends and family, and through social media. Surprisingly, people claim to attach little credence to television in their decision making, despite tradespeople bemoaning the high influence of reality television programs. While renovators claim that their own ideas are most influential in their decision-making, strong anecdotal evidence from people at the front line – notably tradespeople – suggest that television plays an important, albeit hidden, role.

As buyers and renovators move closer to implementation, other professionals become more involved in the process. Trusted advisors include architects and tradespeople, particularly when referred by friends or family. Sourcing trades can elicit significant stress, due to information asymmetry and lack of familiarity with the process. At the implementation stage, renovators’ confidence in their own energy-efficient aspirations falls. Ultimately, “tradespeople are often the difference between the adoption of an energy efficient option and the decision to disregard it”.²² Therefore, there is a need to close the loop by simultaneously considering both consumer demand and supply chain engagement.

Some research suggests the secret to strengthening consumer decision-making and confidence is to use role models, together with highly-effective social media and high-reach broadcast media.²³



16 Crawley et al, *A Framework for a Community Engagement Strategy for the Built Environment*, 2010.

17 Instinct and Reason, *Connecting comfort to energy efficiency and sustainability*, 2015.

18 Colmar Brunton, 2013.

19 Hulse, 2015.

20 Crawley, 2010.

21 Romanach, 2015, Hulse, 2015, Colmar Brunton 2013 and Instinct and Reason, *Sustainable Households survey*, 2014.

22 Colmar Brunton, 2013.

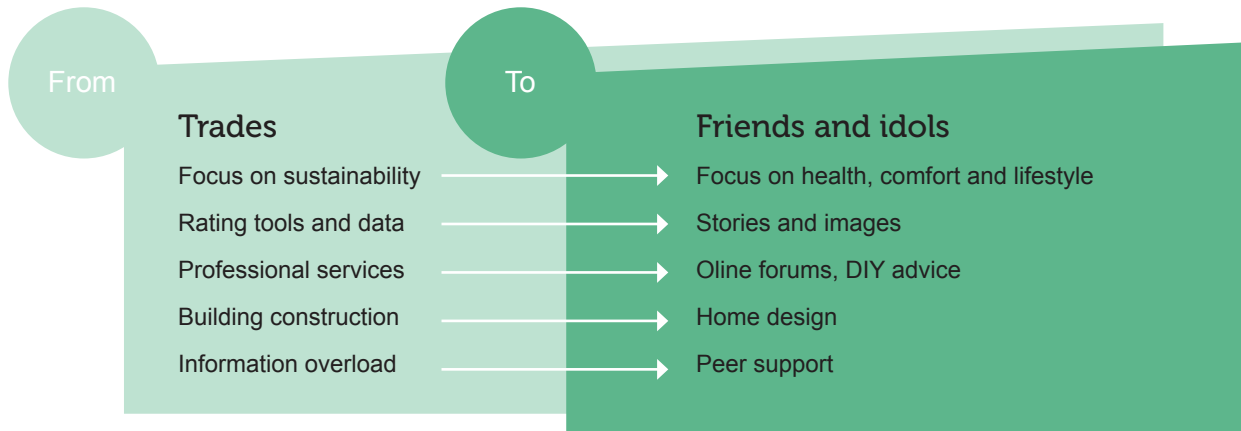
23 Crawley, 2010.

3.2.4. Summary: Vision for reaching consumers

Traditional policy approaches have typically tried to engage consumers by communicating altruistic environmental narratives and/or cost benefits. This narrow policy focus applies two diametrically opposed strategies: appealing to altruism and also to the 'homo-economicus' (or 'economic man') position of self-interest. Furthermore, information has often been siloed into single issues, such as energy or water, rather than treating environmental sustainability holistically. This fragmentation creates competition for consumer attention.

Based on the research findings, a new model for reaching a mass market audience is illustrated in Figure 3.

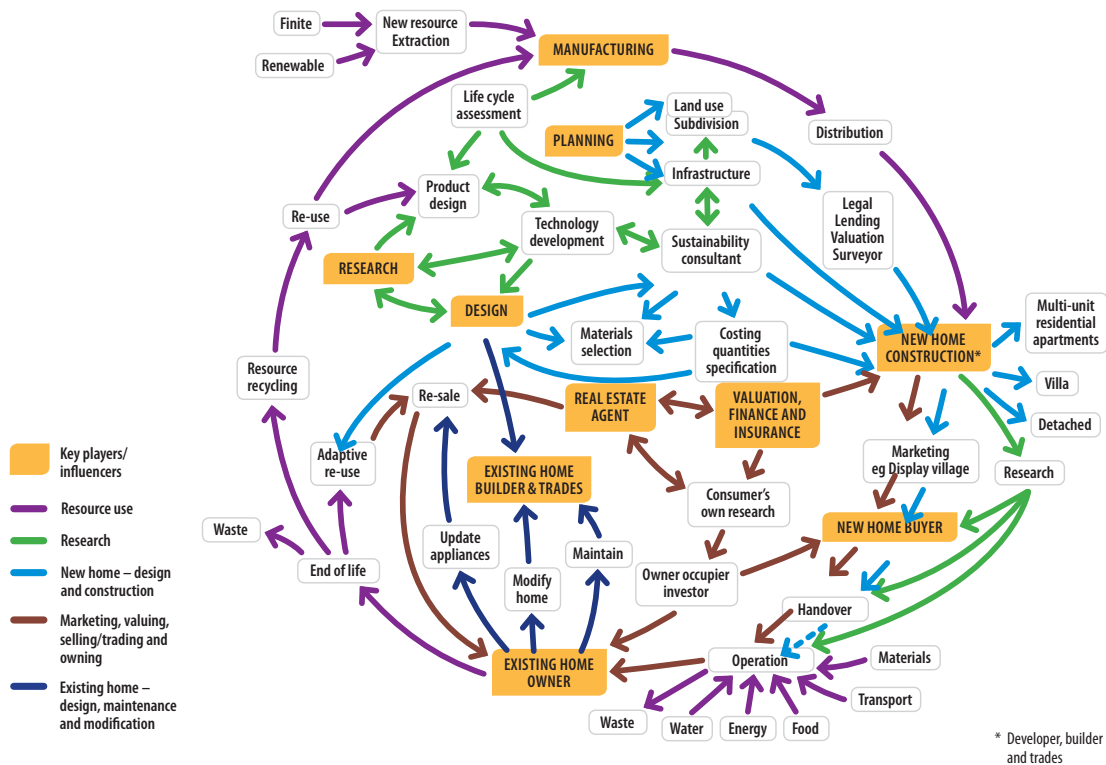
Figure 3: The necessary shift in information complexity, language and source



3.3 Supply chain considerations

Delivering sustainable homes must be achieved within a complex landscape of key stakeholders and processes, as illustrated in Figure 4.²⁴

Figure 4: Housing supply chain



24 Ramboll Environ and Engage2, 2018.

Source: CSHI 2014

3.3.1. Volume home construction

Approximately 40 per cent of new detached dwelling home construction is performed by volume builders. This volume building sector in Australia is essentially split into three key areas: speculative builders; project home or 'to order' builders; and franchise builders, which are a subset of project home builders.

In this market, new home construction decisions are driven by a range of factors including:

- **Compliance** with land covenants (from developers and/or local councils) and building code requirements
- **Marketing** of pre-designed, cost-optimised house designs
- **Product availability**, including the cost and ease of installation of products from manufacturers and suppliers
- **Finance availability** and loan approvals
- **Perceptions** of consumer preferences.



Key decisions are made by home builders on the buyer's behalf. The buyer can choose from a select menu of optional packages but has limited ability to explore alternative designs and products due to lack of skills and knowledge, and because the home building business model discourages deviation from standard packages.

Over time, the market shifts as aggregate consumer preferences emerge. New package options are developed and introduced to the market, and these reflect home builders' *perceptions* of changing consumer taste. Each new package is effectively a market experiment. As a result, the home building market has significant power over consumer choice. And as the market is slow moving, the narrative of anticipated future consumer preference is potentially self-fulfilling.

Considering this market dynamic, transformation is likely to occur when home builders define and package sustainable housing features into discrete marketable home packages. These whole-of-house options can be presented to home buyers alongside other less sustainable house packages. This requires a features-based approach, with "chunked-down" narratives of benefits, so that options can be compared on a like-for-like basis in the sales office.²⁵

Unfortunately, a review of the websites of Australia's top 100 builders in 2017 shows that sustainability information is absent or difficult to find.²⁶ In this research, undertaken by the University of Melbourne, 86 per cent of sites were lacking in comprehensive detail about sustainability options. Only one site used video and interactive content to explain sustainable strategy and concepts. This suggests that the market for sustainability features is not being effectively tested.

Eighty-six per cent of websites were lacking in comprehensive detail about sustainability options.

The market for new apartments – which now represents around 30 per cent of new dwelling construction in Australia – has similar characteristics to that of freestanding homes. Developers play a dominant role in the design and selection of inclusions. Indeed, apartment buyers are even less likely to be offered a choice of differentiated home packages, due to the inherent standardisation of the product. For this reason, mobilising builders of detached homes should be the 'first cab off the rank' to grow the market demand for sustainable homes. The resulting market trends would then help to influence apartment developers.

3.3.2. Bespoke construction and renovation

Home renovation makes a significant contribution to construction revenue. Master Builders Australia, for example, has forecast a boom in renovations that it expects will average \$8.8 billion per year and top \$44 billion by 2023.²⁷ The home renovation market is more bespoke than the new homes market and is dependent on planning and individual decisions of the renovator. Architecturally-designed homes are a small segment of the market and are similarly bespoke, although they are constructed with the guidance of an architect as an informed intermediary.

Builders in this segment tend to be small business operators. As explored earlier, home builders are often key advisors and have significant influence over the range and price of inclusions. Research into the knowledge, motivations and expectations of construction industry specialists suggests that builders tend to:

- Perceive 'quality' as a primary attribute of energy efficient products
- Identify energy and bill savings as primary motivators for consumers but are less aware of the potential of energy efficient products to increase the capital value of a home
- Believe there is limited consumer demand for sustainable homes
- Doubt the industry's understanding and ability to deliver energy efficient products and services.²⁸

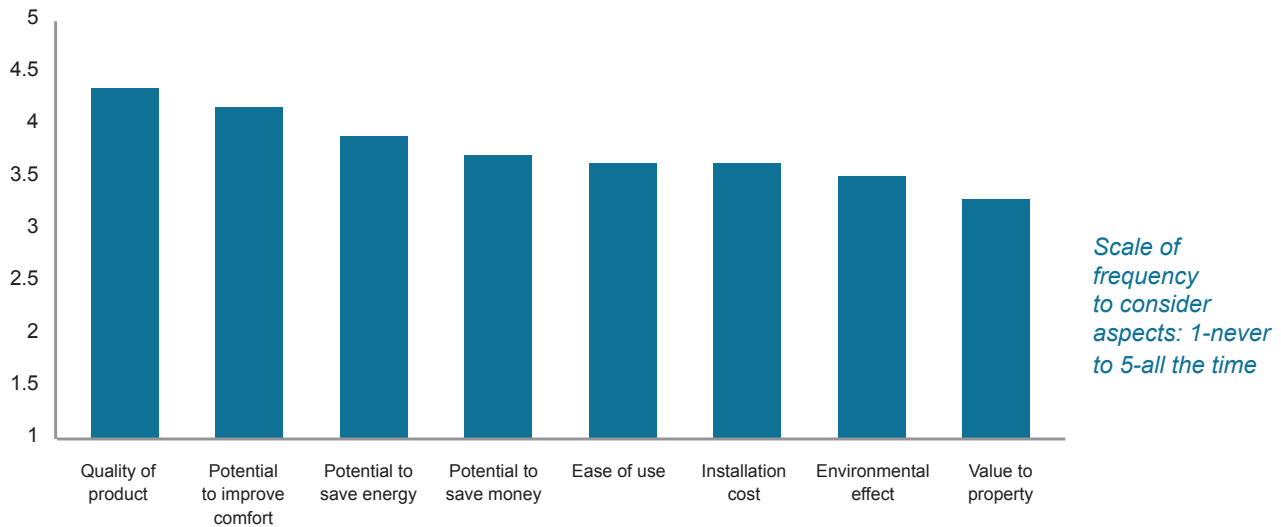
25 Crawley, 2010.

26 Warren-Myers G. et al, *Volume Home Building: The Provision of Sustainability Information for New Homebuyers*, 2017.

27 Master Builders Australia, *\$Billion Renovations Market Set To Boom*, 2018.

28 Romanach et al, *Housing Specialist and Real Estate Industry Survey*, 2015.

Figure 5: Factors considered when recommending products

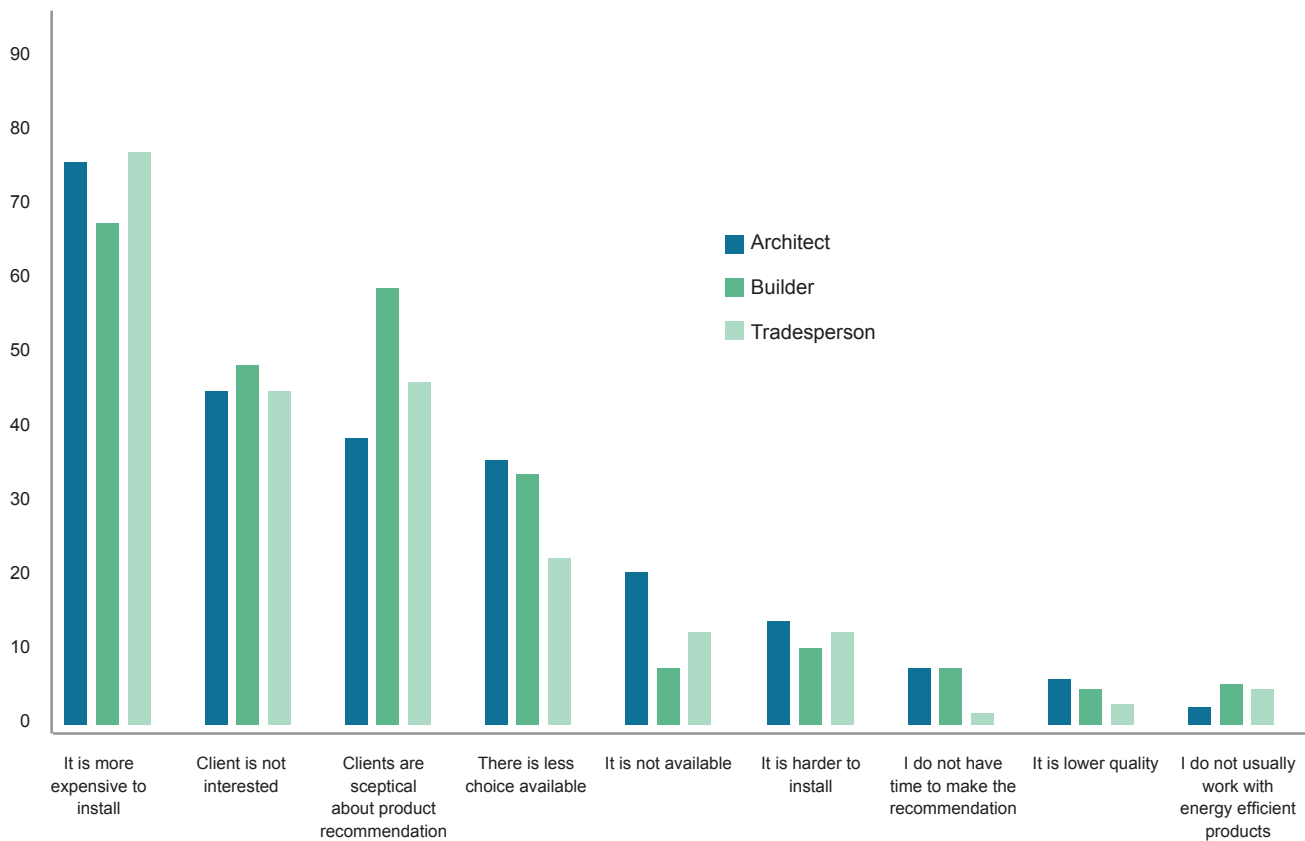


Source: Romanach, 2015

A survey of nearly 500 construction industry specialists undertaken by the CRC for Low Carbon Living in 2015 found very high levels of support for energy efficiency, with almost all respondents (98%) agreeing that consumer uptake of energy efficient products should be encouraged.²⁹ Other research indicates that clients drive the implementation of energy efficient products, and that there is some scepticism of environmental claims and risk aversion when it comes to new and unfamiliar products.³⁰

It appears that construction industry professionals mainly perceive energy efficiency products and services through a “homo-economicus”, or cost versus payback, lens.

Figure 6: Construction industry perception of energy efficiency



29 Romanach, 2015.
30 Instinct and Reason, 2014.

Source: Romanach, 2015.

3.3.3. Other key industry influencers

As evidence suggests both lifestyle and financial narratives are influential, the Collaborative Sustainable Housing Initiative identified several key industry influencers that help to drive the uptake of sustainable homes:



Finance industry: The finance industry determines the availability and cost of loans to the home buyer. The allowable size of a loan will depend on, among other things, the market value of a property. Low-cost finance may also be available through private ethical investing ('green bonds') or through various government incentive mechanisms. Consequently, the finance industry is a key arbiter of value in the market, driven by property sales data correlated with the characteristics and features of the home. While research has shown a positive correlation between environmentally-sustainability features and price, such correlations are not yet well accepted or embedded in the considerations of the mainstream finance industry.^{31 32}



Real estate: The real estate industry has a closer relationship to the real-world "predictably irrational" buying behaviour of prospective homeowners. While this group also takes a features-based approach to marketing, the real estate industry has a broader focus on amenity, investment returns and market capitalisation. The real estate industry – especially property valuers – is a key broadcast medium and advisor on property value.



Land developers: Land developers are driven to demonstrate their environmental sustainability credentials in the land acquisition phase and have market power to set covenants to which the construction industry must adhere. Some of Australia's major developers lead the world in GRESB ratings, the global real estate sustainability benchmark. Along with government landowners, these leading developers are pushing the industry's boundaries of best practice. However, they are understandably reluctant to create perceived cost burdens on consumers.



Manufacturers and suppliers: This group will typically look to establish high-volume, cost-effective standard product ranges, using the construction industry as a distribution channel to the home owner. The cost of marketing direct to consumers is less attractive. It is therefore difficult to obtain economies of scale for higher performing products, leading to a Catch 22 perception of high cost.

31 Fuerst and Warren-Myers, *Green Lemons? Energy-Efficiency Disclosure and House Prices*, 2017.

32 Australian Department of the Environment, Water, Heritage and the Arts, *Energy Efficiency Rating and House Prices in the ACT*, 2008.



3.3.4. Summary: Mobilising the supply chain

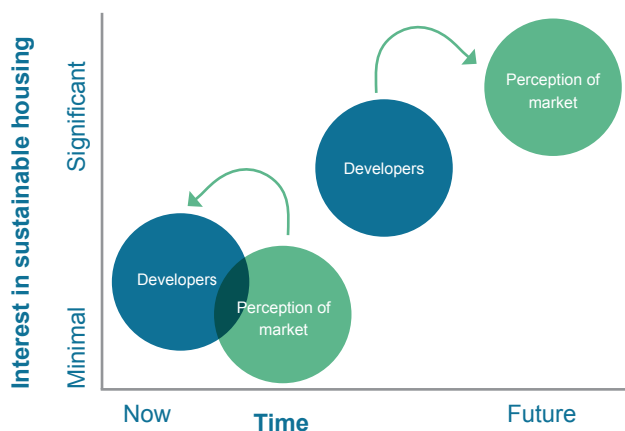
The residential construction industry has significant influence over consumers' future product choices. Unfortunately, the construction industry's commercial return is unclear and sustainable housing remains largely a niche market. The main motivations for actors in the housing supply chain include financial gain and regulatory compliance.³³

Driving a mainstream market demands specifically-targeted financial incentives for home builders. These incentives could create competitive advantage, leading to more business opportunities and increased profit. Supply chain interventions must, therefore, be aimed at "showing industry the money".

Considering the available research, our suggested model to engage the construction industry would be to market-test new ways of packaging sustainability features, alongside parallel narratives that communicate upward-trending market demand for sustainable housing and the benefits to the construction industry.

While industry has experimented with sustainability features in the past, this has generally been undertaken with a relatively narrow understanding of the consumer benefits, and limited marketing support. Our strategy aims to incentivise sustainable housing by simultaneously stimulating consumer demand and real-life construction industry experimentation.

Figure 7: Vision of a forward looking construction industry



Now

- Developers perceive disinterest
- Supply chain held back
- Consumers lack choice

Future Vision

- Developers perceive desire
- Supply chain builds capacity
- Diversity of options

33 Acil Allen, *Analysis of Capability to Support NSW and Victorian Government Energy Efficiency Policies and Programs*, 2017.

4. INDUSTRY PRIORITIES FOR GROWING THE MARKET FOR SUSTAINABLE HOMES

The CSHI and CRC for Low Carbon Living have consulted broadly with industry stakeholders since 2014 to define core problems in delivering more sustainable homes, identify solutions and advance opportunities.

Through this process, a range of interventions and projects were identified that would help to deliver market transformation by increasing customer demand and improving the supply chain. These were grouped into five key strategic focus areas (Table 1).

Table 1: Existing and desirable initiatives identified through the CSHI process

Strategic focus area	Purpose	Examples and recommended actions
Awareness and behaviour change	<p>Establish consensus on a clear definition of a sustainable home – one that is consumer-focused, easy to understand and cost-effective.</p> <p>Provide information delivery mechanisms and social support to home buyers and renovators at key moments of decision making.</p>	<ul style="list-style-type: none"> Shared communication campaign (the new narrative for housing – Liveability Real Estate) and a TV media campaign Social media platform (such as My Renovation Planner) Eco-house packages market research and marketing collateral (10-star energy efficient demonstration such as Josh's House)
Planning and incentives	<p>Mobilise intermediaries, including research, government and finance sectors, and establish commercial incentives to motivate the construction industry to adopt sustainable housing construction as its preferred product.</p> <p>Target key moments for delivering incentives: at the urban planning (precinct development) approvals stage; and at the financial structuring stage of the construction process.</p>	<ul style="list-style-type: none"> Data and research <ul style="list-style-type: none"> NatHERS HStar Portal Housing mapping and housing typology Construction industry value proposition Property valuation methods Whole of house benchmarking and disclosure (e.g. Victorian Energy Efficiency Scorecard, CEMP, National Energy Productivity Plan Measure 5) Developments with Green Star – Communities ratings NABERS commitment agreements and building upgrade agreements for apartments Planning and structural incentives <ul style="list-style-type: none"> Greyfields re-zoning Accelerated approvals Financial incentives <ul style="list-style-type: none"> Low interest loans/ accelerated depreciation (e.g. Clean Energy Finance Corporation Community Housing) State-based energy savings schemes
Leadership and innovation	<p>Demonstrate and showcase best-practice products and services, expose the benefits of sustainable housing, and communicate how it is achieved (to renovators, buyers and to the construction industry).</p> <p>Support the development of new products and manufacturing.</p>	<ul style="list-style-type: none"> Engage builders in product and marketing innovation. <ul style="list-style-type: none"> SA Zero Carbon Challenge Competition 10-star energy efficient demonstration home, Josh's House Victorian Zero Net Carbon Homes Sustainable House Day National Energy Productivity Plan Measure#12 Product development and demonstration grants for innovators (Low Carbon Living CRC, ARENA and Clean Energy Finance Corporation)
Education and training	<p>Build a consistent base of knowledge (and training units) across the construction supply chain that is accessible and can be tailored to the needs of each industry/trade provider.</p> <p>Engage industry associations to provide skills recognition (including CPD training and quality assessment).</p>	<ul style="list-style-type: none"> National Energy Productivity Plan Action <ul style="list-style-type: none"> Training to improve compliance Review and update Your Home Training endorsement and pathway mapping GreenSmart refresh Supply Chain Sustainability School New training packages and/or new delivery modes for existing packages Sales agents (builders and developers)
Manufacturing and supply chain	<p>Address discrepancies between design and construction, and support manufacturers and suppliers to address consumer confusion around sustainable products.</p>	<ul style="list-style-type: none"> Manufacturers' network and register of good environmental choice products (such as GECA and Green Tag) Demonstrating product and installation compliance (National Energy Efficiency Building Project)

Some early stage programs and interventions are already in place, but these activities are not at the necessary maturity, scale, coordination and execution to achieve market transformation. Further coordination and, in many cases, additional funding is required to achieve the desired scale and impact.

CSHI held further consultation with industry stakeholders in 2018 to better understand how these actions could be prioritised to achieve market transformation. Key themes for market transformation and the frequency with which these were cited as being important are illustrated in Figure 8.

Figure 8: Frequency of theme citation

Theme	Percentage
A: Equity of access, particularly relating to affordability and rental tenants	3%
B: Accountability, particularly in terms of compliance with regulations and standards	9%
C: Mass-media and marketing strategy, addressing the value consumers place on sustainability	31%
D: Government leadership	2%
E: Predictability	1%
F: Government legislation	5%
G: Economic value proposition	9%
H: Self-sufficiency, independence and resilience	7%
I: Access to information and education	29%
J: Environmental impact	1%
K: Innovation and experimentation	3%
L: Other	0%

Mass media marketing and communication with consumers were identified as central to market transformation. While there is no shortage of available technical information, there is currently no mass media vehicle to stimulate public interest in sustainable housing. This highlights a key gap to be addressed.

Feedback from the workshop suggests that, in the chicken-and-egg paradigm of stimulating demand versus stimulating the supply chain, consumer engagement should be a priority. With increasing market demand, CSHI's strategic focus areas will start to fall into place.

Notwithstanding the need for continued work across all identified strategic focus areas, a coordinated mass media program emphasising the lifestyle and economic benefits of sustainable housing is vital.



5: CONSTRUCTION INDUSTRY ECONOMIC BENEFITS AND BUSINESS CASE

The residential construction industry has assumed that sustainability is a cost burden, rather than a market opportunity. Consequently, a general ambivalence to new opportunities prevails.

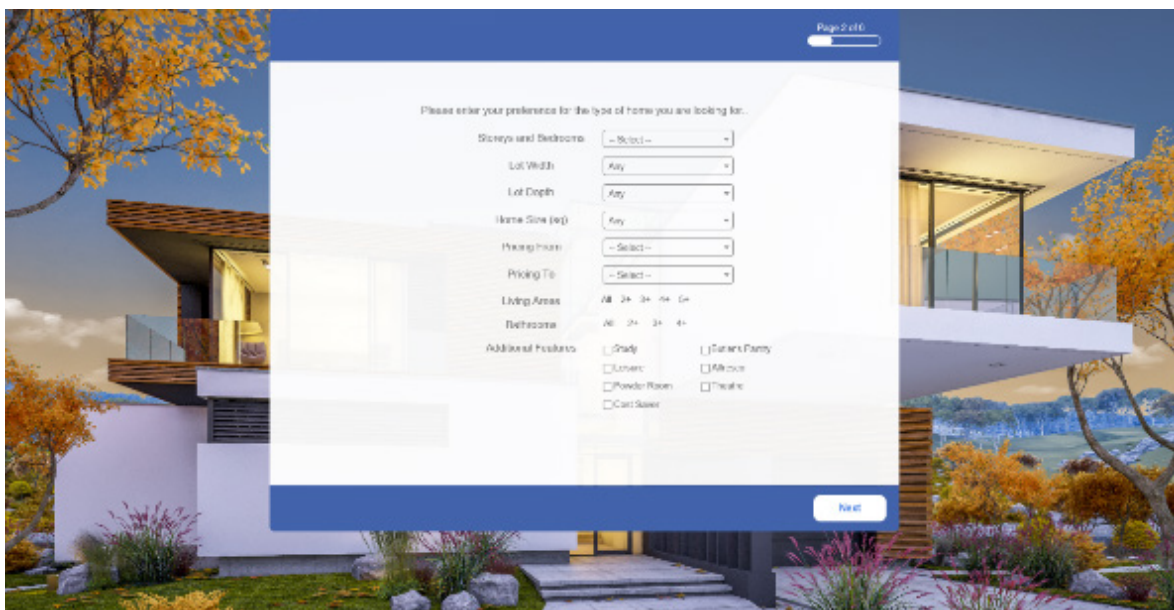
This is unfortunate, as new investment in sustainable housing has the potential to create new jobs and growth. For every \$1 million of construction output, nine jobs are created in the construction industry, seven jobs added to the supply chain, and \$2.9 million in economic value created across the economy.³⁴

This section aims to quantify the opportunity and value proposition for the housing construction industry, and the potential to boost the Australian economy.

5.1 Market potential

In 2018, CSIRO conducted an online survey of 1,172 people. The survey mirrored the process of viewing a home builder's website. Participants filtered options to select their desired home through standard drop down menus and tick boxes (Figure 9). The sustainable home was represented in one of three alternative phrases: energy efficient, comfort plus or cost saver.

Figure 9: Web-based presentation of selectable home features



The phrase 'energy efficient' was highly effective at garnering interest, with 67 per cent of the participants selecting this option. Indeed, energy efficiency piqued more consumer interest than other features, such as a study (55%), al fresco (41%), butler's pantry (30%), powder room (18%) or home theatre (18%).

In the second step of the survey, respondents were presented with a selection of house floor plans reflecting the available homes that matched their selected preferences (number of bedrooms etc), and detailed descriptions of the features of each home (Figure 10). The research found that the floor plans with additional 'sustainability' related text have on average 8.6 per cent higher purchase preference than the standard version of the same design.

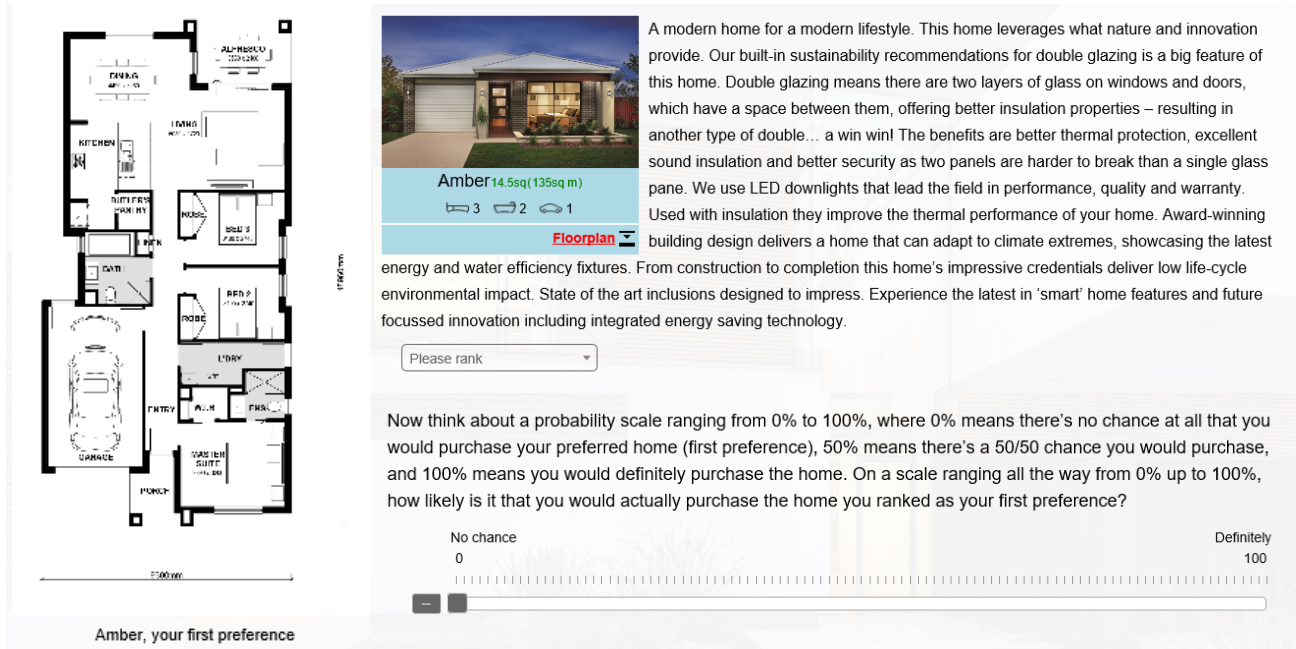
While floor plan layout was a much stronger indicator of overall product preference than sustainability features, the addition of sustainability features to the preferred floor plan provided a clear improvement over the base floor plan.

If a sustainable option was presented for each house design, accompanied with targeted marketing collateral, it is estimated that around two-thirds of the housing market would select the sustainable version.

34 HIA, *The Economic Multiplier Effects of Housing*, 2010.

5.2 Costs and benefits

Figure 10: Surveying the impact of sustainability descriptions on purchase probability



CSIRO undertook economic analysis using the Victoria University Regional Model (VURM) to better understand the impact of transitioning to sustainable housing in Australia. To perform this analysis, it is necessary to understand the difference in cost of a sustainable home, and to quantify the financial benefits of the sustainable home compared with a standard home.

On the benefits side, thermally-efficient sustainable homes deliver multiple benefits including:

- Lower energy consumption and lower energy bills
- Improved comfort and amenity from a house that is naturally warm in winter, cool in summer and has good ventilation and natural daylight
- Improved health outcomes from reduced exposure to cold damp living conditions in winter and heat in summer.

For simplicity, the economic analysis considered only the energy bill savings component as a benefit.

On the cost side, it is difficult to estimate the additional cost to build a sustainable home because there are myriad ways to increase the thermal performance of homes, with widely varying impacts on the cost of construction.

Increasing the stringency of the National Construction Code's energy efficiency provisions from 3-star NatHERS to 5-star was shown to have negligible impact on construction costs.³⁵ Allowing for technology advancements and supply chain adjustments, we assume that (after an initial period of time, where the cost of constructing thermally-efficient homes is higher) the final cost of constructing sustainable homes will become cost neutral when compared to houses built solely to the current Code.

Significant work has been undertaken recently by the CRC for Low Carbon Living to estimate the likely cost to increase the star rating of homes in the current market (prior to any learning).^{36,37} This work found that the cost of increasing the star rating of a home from the current 6-star minimum performance to 8-star is around five per cent (around \$11,000). This will decrease with time and production volume. Some technologies required to achieve a net zero energy home, such as solar panels, are already deemed cost neutral.

35 Ambrose et al, *The Evaluation of Residential Building Energy Efficiency Standards*, 2013.

36 Bannister et al, *Building Code Energy Performance Trajectory: Interim Technical Report*, 2018.

37 Byrne et al, *High Performance Housing – Monitoring, Evaluating and Communicating the Journey*, 2019.



5.3 Economic impact

Using the VURM model, CSIRO modelled three different scenarios to understand the economic benefit of a market-based transition to sustainable housing. These were:

- **Business as usual:** In this scenario, houses continue to be built to the 6-star NatHERS minimum performance prescribed in the current National Construction Code.
- **Incentivised transition:** In this scenario, a subsidy is provided to those homes that are built to a zero-energy standard. The subsidy starts at around \$11,000 and declines to zero by 2040, when it is assumed that building a zero-energy home is cost neutral. Demand for zero-energy homes is assumed to increase linearly from the current level (of zero) to market saturation of two thirds of all homes built in 2040.
- **Demand-driven transition:** This scenario achieves the same level of transition as the 'incentivised transition' model. However, the transition is achieved with a \$20 million mass media campaign over three years (\$10 million in the first year and then \$5 million in each of the following two years) to catalyse industry action, rather than driving adoption through government subsidies.

Clearly, these scenarios are coarsely defined with the aim of demonstrating the general principle of the market transformation benefit to Australia and the construction industry, rather than to define a detailed program.

The preliminary economic modelling found that investing in a voluntary market-based approach leads to a rapid acceleration in the uptake of sustainable homes. In particular, the 'demand-driven transition' scenario achieves a catalytic impact at much lower cost to government (\$20 million) compared with providing subsidies under the 'incentivised transition' scenario (\$500 million). Therefore, this Roadmap has adopted the 'demand-driven transition' scenario.

Based on preliminary modelling of the 'demand-driven transition' scenario, investment in the proposed voluntary pathway to sustainable homes would yield the following benefits by 2030:

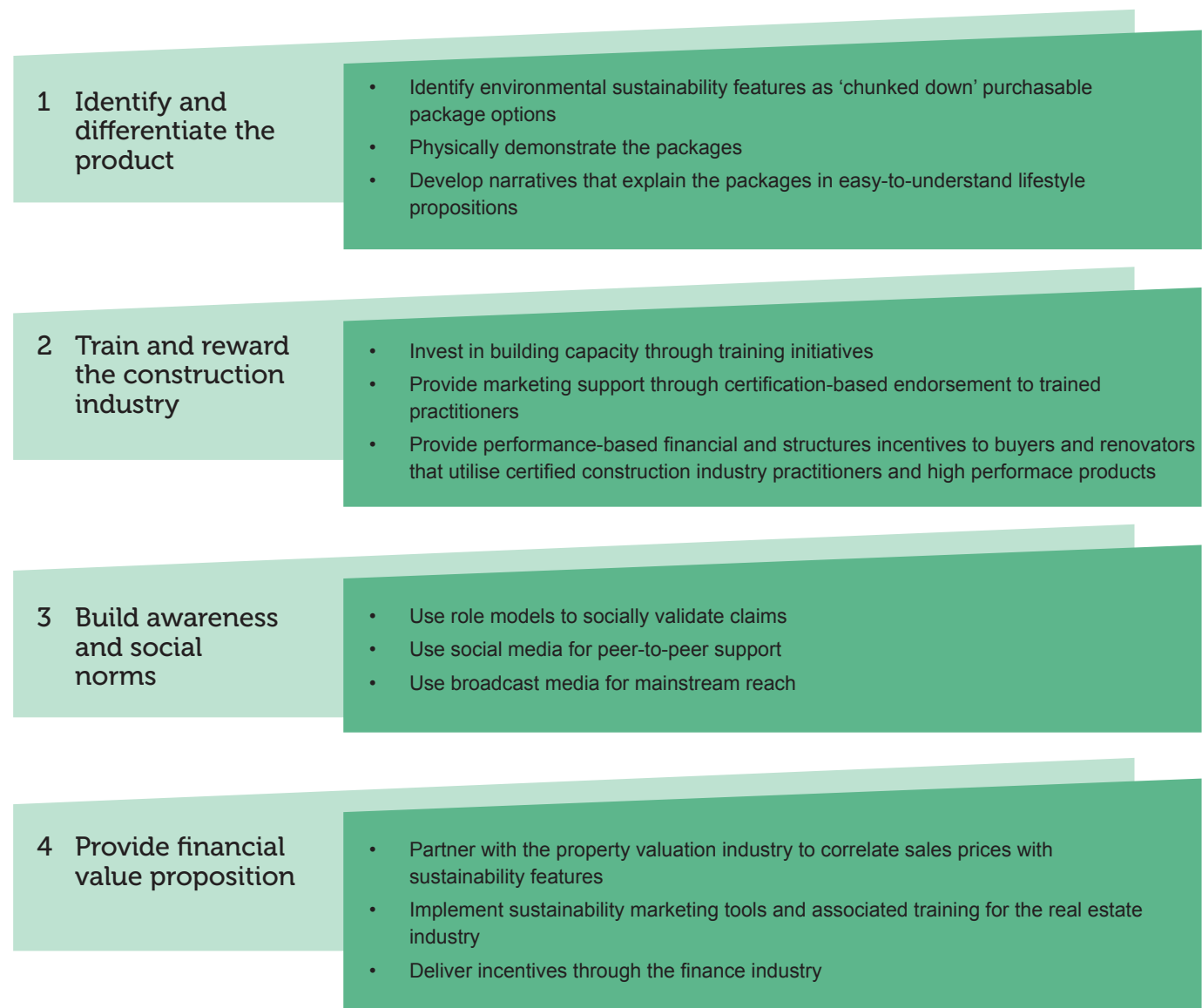
- Deliver more than half a billion dollars of extra investment in the construction industry
- Create over 7,000 new jobs
- Save Australians \$600 million on their energy bills.

The preliminary modelling shows that an engagement campaign would cost less than \$1.60 for every tonne of greenhouse gases abated, while simultaneously providing homeowners with comfortable, healthy, affordable homes to live in. More research would be required to refine an optimum market-based campaign.

6: A PROPOSED SUSTAINABLE HOMES TRANSITION ROADMAP

Applying the rigorous research and theory of change, described earlier in this document, to the sustainable homes conundrum, We propose a strategy that simultaneously creates a consumer 'buzz' and empowers the construction industry supply chain. This dual approach is required to both generate and support market demand for sustainable homes.

Figure 11: Elements of the proposed Sustainable Homes Transition Framework



Each of these elements are mutually reinforcing and will be less effective if undertaken in isolation. For example:

- Product differentiation (element 1) creates features for marketing (elements 3 and 4), training (elements 2 and 4), valuation (element 4), and industry incentivisation (element 2)
- Value proposition (element 4) creates delivery partners to raise awareness (element 3) and to provide incentives (element 2). It also informs the property narratives (element 1) and provides carrots that incentivise participation in training and certification (element 2).



Embedded inside the framework are three key narrative-building layers described in the ASBEC Framework for Residential Ratings.³⁸ These are:

1. **Rating for minimum standards** (regulatory). Certified practitioners (element 2) should demonstrate competence and compliance against these standards to be eligible for incentives
2. **Rating whole of house benchmarks** provides the foundation for performance-based incentives (element 2) and finance (element 4)
3. **Features identification and communication tools** would provide the basis for sales and marketing to home buyers and renovators (elements 1, 3 and 4); it would also establish a common language between trades and consumers (element 2).

A thriving market for sustainable housing, coupled with a motivated construction industry, would incentivise the wider supply chain (product manufacturers and suppliers) to drive product innovation and adopt training. It would also remove barriers currently faced by developers when setting ambitious targets for new precinct developments.

38 ASBEC, 2015.

7: IMPLEMENTING THE SUSTAINABLE HOMES TRANSITION ROADMAP

The COAG Energy Council's *Trajectory for Low Energy Buildings* demonstrates a nationwide commitment to better performing homes. In the context of a changing climate, sustainable homes are not only energy efficient but also resilient and resource efficient.

Government and industry must partner to build the market for sustainable homes, applying the proposed Sustainable Homes Transition Roadmap to guide the process.

Implementing the Roadmap would take advantage of latent consumer demand for sustainable homes. It aims to provide resources and commercial focus to overcome identified barriers and capitalise on opportunities. In particular, the Roadmap aims to overcome the 'tragedy-of-commons' challenge, where individual companies are unable to achieve the critical mass necessary to drive market awareness and uptake, and where the efforts of front-runners creates a free-ride for others.

Successful delivery of the Roadmap will require political commitment and coordinated leadership between federal, state and territory governments, in collaboration with the home building sector. Key actions to advance this Roadmap are:

1. National commitment to a voluntary pathway for sustainable homes:

Australian federal, state and territory governments to prioritise a voluntary pathway for sustainable homes and work together to establish and resource an entity to oversee activities that execute the Roadmap.

This entity would work in partnership with Australia's property and construction industry to deliver the actions outlined below to: establish an agreed definition for sustainable housing that resonates with consumers; improve coordination of initiatives to avoid consumer confusion, duplication and fragmentation; and facilitate commercially-focused activities.

2. Certification and training:

Create benchmarks that support the new definition of sustainable homes and upskill the building sector to implement these benchmarks. Steps would include further work to:

- Establish a standard for new best practice sustainable homes
- Develop a certification program and training for the home building sector
- Work with relevant state and territory agencies to establish an energy efficiency disclosure scheme for existing homes
- Support training for real estate agents, volume builders and land developers to deliver a sales narrative that underscores the benefits of sustainable homes.

3. Pilot program:

Spearhead a 1,000-home pilot program that incentivises volume builders to deliver sustainable homes. The results of the pilot program would be used to:

- Validate the sustainable home standard
- Support training and accreditation of early industry adopters
- Uncover the personal stories of homeowners and tradespeople participating in the pilot program, and deliver media collateral to support mass media consumer engagement
- Assess the need for any subsequent government program for ongoing incentives to complete the market transformation.

4. Consumer engagement campaign:

Develop and deliver a longitudinal consumer engagement campaign – including programming in mainstream broadcast media, social media and commercial product placement – to accelerate the adoption of sustainable homes and support early adopters to enter the market at scale.

5. Finance:

Engage with the finance sector to:

- Enforce basic quality standards and seek disclosure of ratings for loan approvals
- Embed sustainability features into property valuation methods, and concomitant lending limits
- Deliver lower cost finance for high performing homes.

These actions, driven by the Sustainable Homes Transition Roadmap, will help to shift culture and awareness in the real estate market, and spark a national conversation on performance-based house design. Home owners will be empowered to identify and value higher quality homes that deliver greater amenity and reduce costs. The supply chain will gain confidence and financial reward as it adapts to the new market. The Roadmap will create jobs, boost construction output and create millions in value across the Australian economy. And it will support the delivery of homes that are cheaper to operate, healthier to live in, and better for the environment.

8: APPENDIX A: CASE STUDIES



8.1 Renovate or Rebuild

Can consumer behaviour change in the residential housing market be driven by mass media?

To answer this question the CRC for Low Carbon Living has merged its behavioural science insights with the creativity and innovation of its partners to help Australian home owners choose healthier and more energy efficient homes.

The result is a new lifestyle TV show called Renovate or Rebuild.

Renovate or Rebuild promotes sustainable homes as comfortable, affordable, efficient and healthy. The project uses popular storytelling – in the form of reality TV – alongside a ‘call to action’ website and an ‘impact community’.

The ‘impact community’ – modelled on the War on Waste and The Block television shows – includes research partners, peak industry bodies, residential volume builders and developers, construction material suppliers, industry media, utilities, real estate, finance providers and other state and federal government departments. The impact community promotes engagement through social media and provides partner content for the website. The project has delivered a pilot episode of ‘Renovate or Rebuild’ via YouTube.

The website actively promotes companies that supply net zero energy home products, and the call the action is designed to influence consumer purchasing behaviours.

This approach to behaviour change is common in the private sector, however this is the first time the approach has been applied in a collaborative effort between government, industry and academia for social and environmental purposes.

The pilot project aims to validate the behavioural science and inform potential future delivery models. Ideally, it will demonstrate a commercially viable business model to achieve consumer behaviour change without the need for long term government funding. Project findings are expected in July 2019.

Learn more: <http://renovateorrebuild.com.au/>

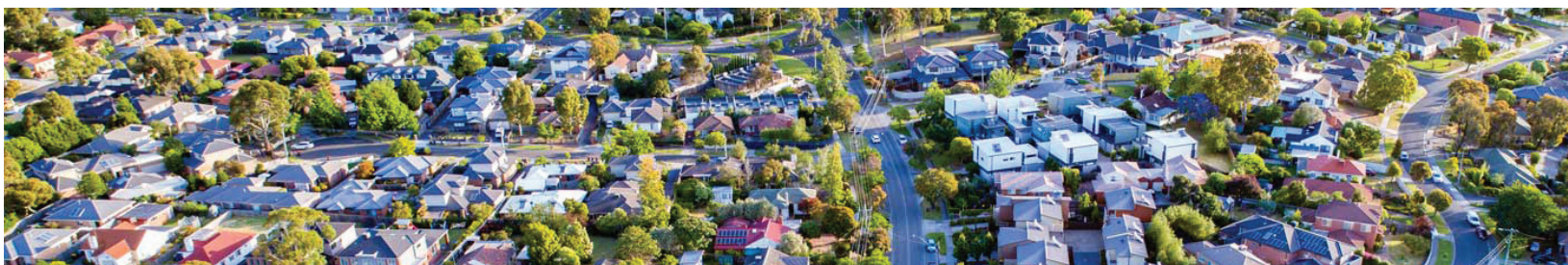
8.2 Zero Net Carbon Homes pilot program

The Victorian Government has provided funding to Sustainability Victoria (SV) for a pilot program to develop and market zero net carbon homes in collaboration with volume builders Metricon Homes, Stockland and SJD Homes, in partnership with Parklea.

This pilot program will provide technical and marketing expertise to each of the builders to facilitate the development, marketing and sales of leading-edge zero net carbon homes. The homes will incorporate a range of features, including double glazing, high-efficiency heating, cooling, water heating, lighting and solar PV.

The program has been designed to be delivered in three distinct and interrelated phases that will enable participating volume home builders to design, construct, market and evaluate homes that meet the program requirements.

Learn more: <https://www.sustainability.vic.gov.au/About-us/What-we-do/Campaigns/Zero-Net-Carbon-Homes-Program>



9: APPENDIX B

The following 93 organisations contributed to or partnered with the Collaborative Sustainable Housing Initiative between 2014 and 2018. Each of these organisations also participated in at least two CSHI forums or workshops.

The contribution of these stakeholders was instrumental in the design and development of the CSHI program streams and projects.

Air Infiltration and Ventilation Association of Australia	Kinesis
Advanced Enviro Safe	Knauf Insulation Australia
Arup	Ku-ring-gai Council
Ask Property Consultants	Lendlease
Atelier Ten	Livable Housing Australia
Australian Building Sustainability Association	Master Builders Association
Australian Institute of Architects	Master Plumbers Apprentices Limited
Australian Living	Masterton Homes
Australian Sustainable Built Environment Council	Michael Mobbs' Sustainable House
Australian Windows Association (now Australian Glass and Window Association)	Mirvac
Autex Australia Pty Ltd	Multiplex
Bankstown Council (now City of Canterbury Bankstown)	National Australia Bank
BehaviourWorks Australia	NatSpec Construction Information
BlueScope Steel Australia	NBN Television
Brickworks Building Products	Northern Beaches Council
Building Designers Association of Australia	NSW Government
Building Products Innovation Council	Pidcock Architecture and Sustainability
Building Verification Council	Planning Institute of Australia
Centre for Liveability Real Estate	Pointsbuild
City of Sydney	Property Council of Australia
CL Creations	Randwick City Council
Clean Energy Finance Corporation	REA Group
Collabforge	Real Estate Institute of New South Wales
Common Capital	Regina Hill Consulting
CoreLogic	South Australian Government
Cork Construction & Consultancy	Shaping Suburbia
CRC for Low Carbon Living	SJB
CSIRO	SmartRate
CSR Building Products	Solar Juice
Defence Housing Australia	Southern Sydney Region of Councils
Dulux	ssd studio
EcoVantage	Stockland
Ecologic	Strata Community Australia (NSW)
EcoSpecifier	Supply Chain Sustainability School
Edge Environment	Sydney Water
Enviroecture	TAFE NSW
Frasers Property Australia	The Shannon Company
Good Environmental Choice Australia	Tony Edge and Associates
Green Building Council of Australia	University of New South Wales
Green Strata Inc	University of Technology Sydney
Housing Industry Association	University of Wollongong
Hyve Projects	Urban Development Institute of Australia
Institute of Sustainable Futures, University of Technology Sydney	Warringah Council (now Northern Beaches Council)
Insulation Australasia	Wattblock
Insulation Council of Australia and New Zealand	Waverley Council
Investa Property Group	Wollondilly Shire Council
	Woollahra Municipal Council

Disclaimer: Participation in the CSHI does not necessarily constitute endorsement of this report.

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