

# Zero Net Carbon Homes How, What and Why?

**Master Builders Association Victoria  
Green Living Conference**

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Team Lead – Sustainable Homes

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## Vision

A sustainable, thriving  
Victoria

## Purpose

Transitioning Victoria to a  
circular climate resilient  
economy

## Challenge

Net zero emission, circular  
economy in Victoria

For more information please refer to  
[Our Year in Review](#)



**Enabling resource recovery  
and reuse**



**Changing the way we manage  
our waste**



**Identifying future  
opportunities through data  
insights**



**Circular economy at work –  
from waste to energy**



**Working with industry to  
produce affordable  
sustainable homes**



**Sustainable education for a  
brighter future**

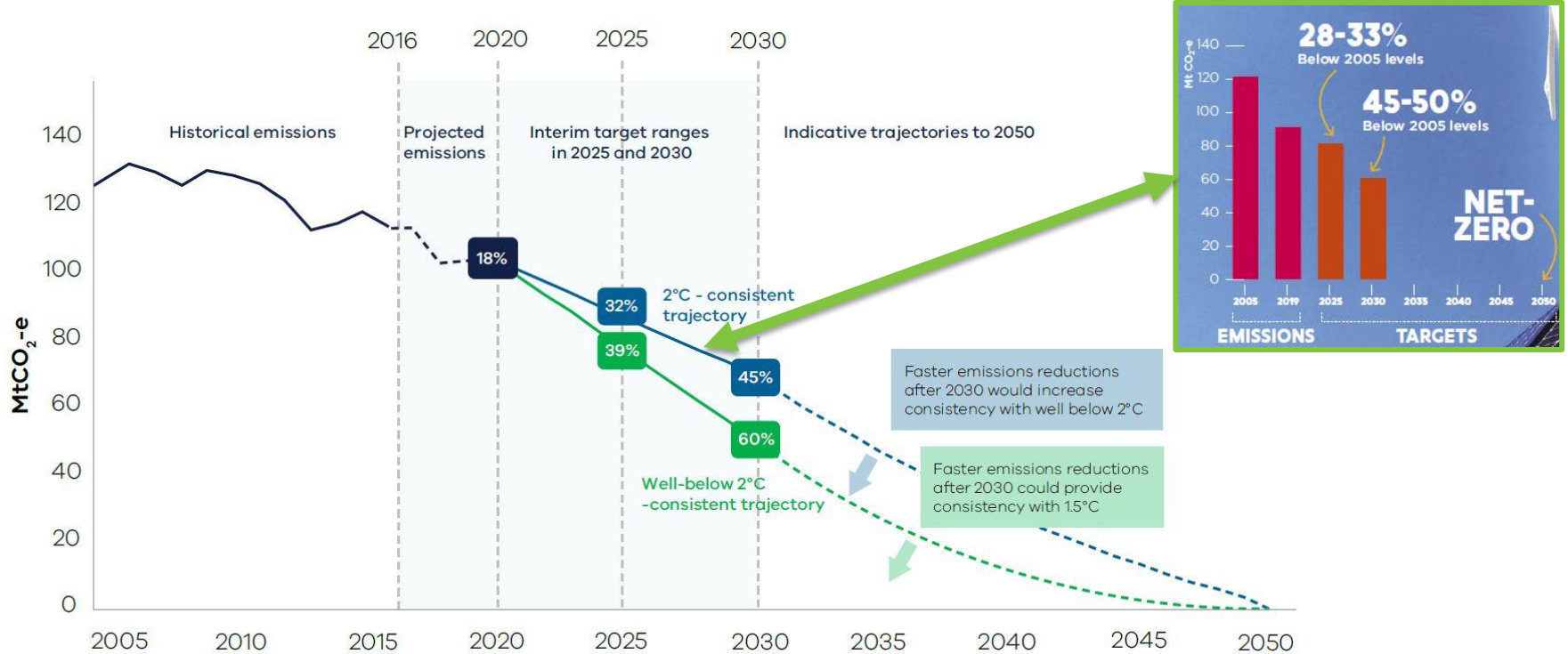


**Educating Victorians about  
correct recycling behaviours**



**Enabling communities to  
create local climate solutions**

# Why and How? Climate Change Act (2017)





# ZNC Homes Program



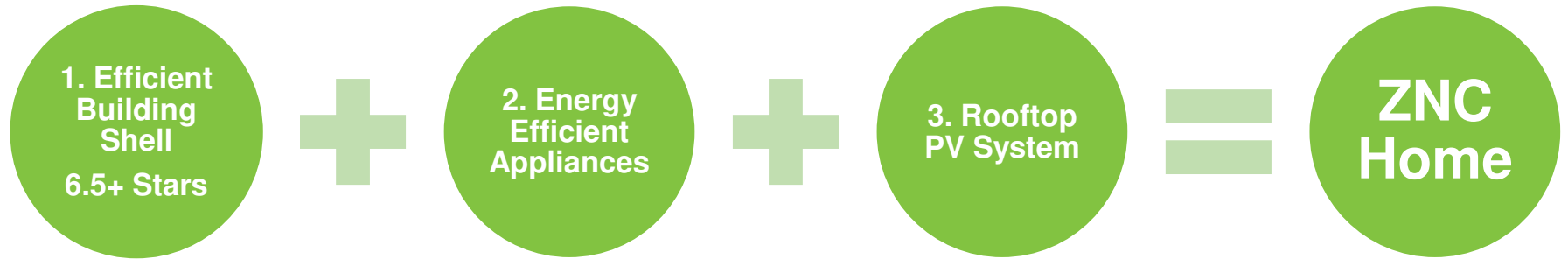
**\$2.182 million pilot program** to partner with three volume home builders to improve the supply of ZNC Homes and increase the consumer demand for ZNC homes.

Performance Measure	Achieved Outcome	Planned Outcome
ZNC homes built	38	6
ZNC display homes built or in the pipeline	10	6
ZNC home sales to consumers	178	Offer only
ZNC home sales without financial support from SV	140	Offer only
Number of Customer enquiries	812	500
Reach	115,000 (SV channels only)	7,000
Research pieces delivered	7	4



# What is a Zero Net Carbon Home?

Designed to produce enough renewable energy to offset the annual greenhouse gas emissions of its estimated energy use.



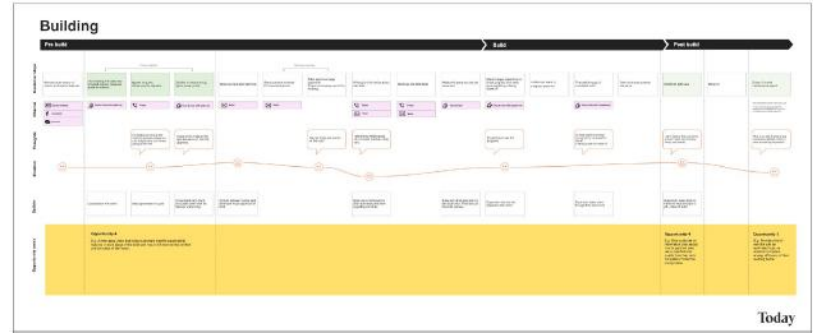
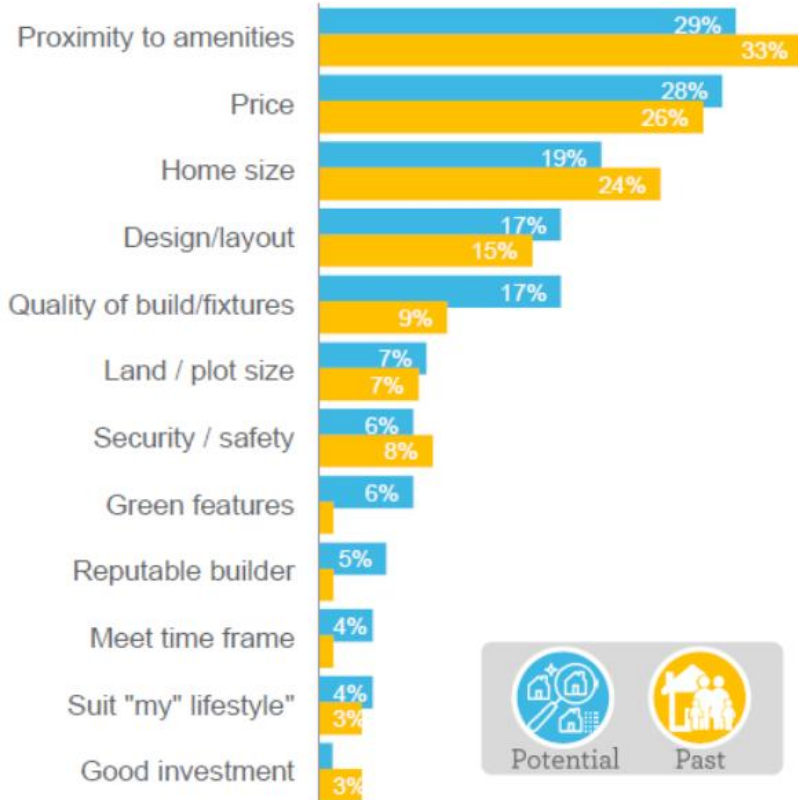
**Homes need to undergo As Built Verification – air leakage & insulation**

**“A man’s home is his castle..”**



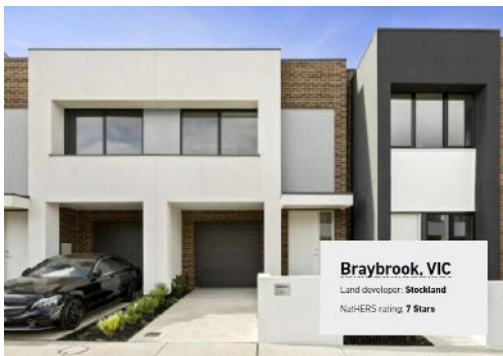


# “LOCATION, LOCATION, LOCATION”





# What did the homes look like?





## ZNC Display home details:

Located in Officer South  
4 Bedrooms, 2 bathrooms, two  
living areas, double garage  
232 m<sup>2</sup> net floor area  
ZNC rated 6.5 Stars NatHERS  
As displayed purchase cost  
\$364,265



## Original Design:

6 Star NatHERS with standard appliances

# Upgrades chosen to get the 6.5 Stars and ZNC



## Appliance upgrades:

Ducted reverse cycle air-conditioner with  
ACOP and AEER of 3.4

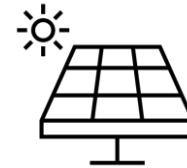
LED downlights and feature lights

Element:	Option:	6 Star (Business as Usual)	Final Design (ZNC compliant)
Roof		Reflective foil sarking	Reflective foil sarking
Ceilings		R6.0 batts	R6.0 batts
Walls (external)		R2.5 batts + wrap	R2.5 batts + wrap
Walls (internal)		R2.0 batts to all	R2.0 batts to all
Floors		Waffle pod slab	Waffle pod slab
Windows & Glazed Doors		Aluminium framed, clear <b>double</b> glazing generally, except: Clear <b>single</b> glazing to large sliding / stacker doors (Dining, Family & Bedroom 1)	Timber framed, clear <b>low-e double</b> glazing generally, except: Clear <b>low-e single</b> glazing to large sliding / stacker doors (Dining, Family & Bedroom 1)

Proposed design:  
(South living area orientation)

6.0 Stars

6.5 Stars



6 KW

# Outcomes



## Savings:

Energy Savings	103% (61 GJ)
Emission reduction	105% (7 tCO <sub>2</sub> -e)
Cost saving p.a.	58% (\$1,522)

## Additional benefits:

Increased comfort for the occupants

These homes are available for anyone within Victoria.





**BAU** | 6 star with builder standard appliances

**ZNC** | 7 star with ZNC Homes program specification appliances and solar PV

typology	<ul style="list-style-type: none"><li>• 3 townhouses</li><li>• 5 small detached (&lt;200sqm)</li><li>• 7 large detached (&gt;200sqm)</li></ul>
size	<ul style="list-style-type: none"><li>• 111sqm to 294sqm</li></ul>
fuel mix	<ul style="list-style-type: none"><li>• 5 all-electric</li><li>• 10 electric and natural gas</li></ul>
climate zones	<ul style="list-style-type: none"><li>• 8 in outer south-east Melbourne (62)</li><li>• 3 in outer northern Melbourne (60)</li><li>• 4 in Ballarat* (66)</li></ul>



# Research from ZNC homes Program

## Zero Net Carbon Homes:

1. **Produce no net emissions** in their operational phase and save 75 tonnes of CO<sub>2</sub> or more between now and 2050
2. **Need between 4 – 6 KW solar** if paired with thermally efficient envelope and efficient appliances
3. **Save money on your mortgage** from the reduction in bills from the onset even if you increase the loan value to pay for the upgrades which cost 3.8 – 6.7% extra to build
4. **Are built with existing materials and technology**
5. **Are attractive to buyers** provided they are explained the benefits

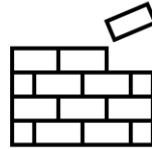


# Beyond ZNC; The 7 Star Homes Program

**Builders  
signed up**



Design



Build



As Built  
Verification



Complete & rebate  
paid

**Builders = 29**  
Target was 20

**30 to date**  
64% are ZNC  
7.6 stars rating average  
Target is  
7 Star whole of home  
design

**5 homes built**  
Target is 80

**4 houses  
completed ABV**  
Target is 80

**Homes = 81**  
Target was 80

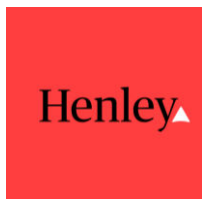
## Provide training and support in:

- > Whole of Home assessment
- > 7 star plus design & construction
- > As built verification
- > Selling sustainable homes



# Builders in the 7 Star Homes Program

Mansion Builders Pty Ltd



Martin Builders  
HARRIS  
BUILD



J.MAR Constructions Pty  
Ltd



MICHAEL LIMB BUILDERS  
SPECIALISTS IN ECO-CONSIDERATE  
DESIGN & CONSTRUCTION

bobcon  
metricon





# If you are interested

[Register for the 7 Star Homes Program training](#)

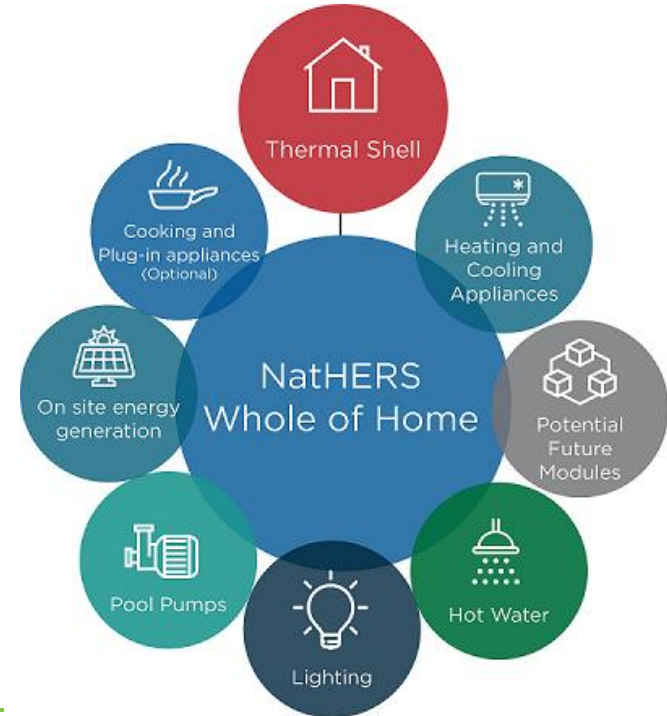
## Case studies:

[ZNC Homes Program](#)

[7 Star Homes Program](#)

[Research from the ZNC homes program](#)

Or contact [inge.Sarunic@sustainability.vic.gov.au](mailto:inge.Sarunic@sustainability.vic.gov.au)



# Questions?

