## **POSITIVE FOOTPRINTS** Renovating **Existing Homes** for Net Zero Outcomes

Presenter: Jeremy Spencer



#### ~8T/yr

Residential Baseline Study 2015



\$1200000.000 \$1.500

# Follow the well trodden path...

...to Net Zero!

## Join the Conga Line...

### ...to Net Zero!



# **POSITIVE FOOTPRINTS** Cheese House

www.positivefootprints.com.au



### **CHEESE HOUSE STORY...**

## 2 Adults, 2 kids

### ~52kWh / day (Combined Gas & Elec ) net consumption

www.positivefootprints.com.a

### **Original Conditions**



Appliances Cooking 15% 3% Lighting **Space** 4% conditioning 60% Water heating 18%

Australian Av. Home Energy Use (2015 Residential Baseline Study) Average Vic Home: ➢ 68889 MJ / yr (52kW hr/day Dual)

≻~8 Tonnes CO2 / yr

> \$2686 energy bill

**≻~200m2** 

Av. 3 star home (Pre 1990: 1.5stars)

















#### Living to North













## Use NatHERS software interrogation at design















#### Windows: U2.1 SHCG 0.4





















#### Re-insulation of existing walls











#### **Re-insulate Existing Floors & Attic**





























#### **Build a High Performance Culture**

18.2





**Positive Footprints Thermal Ninjas** 

**\$FLIR** 

























#### Heat Pump Heating (All Electric House)

222

Appliances oking 15% 3% Lighting conditioning 4% Water heating 18%

#### Victorian Av. Home Energy Use

Space

60%

**7★** 

(2015 Residential Baseline Study)

#### Heat Pump Heating (All Electric House)

222

Appliances 3% conditioning Water heating 18%

Space

60%

7★

#### Victorian Av. Home Energy Use

(2015 Residential Baseline Study)

oking

Lighting

4%













#### Install Water Efficient Fixtures





and coverage. The result is an

e, full-body experience.



3 star – 9 l/min 4 star – 7.5l/min 5 star – 6l/min



#### 1/3 Hot Water





















#### Install Heat Pump Hot Water





#### Install Heat Pump Hot Water



Step 3: Minimise Lighting Energy Use





#### LED's & Pendants



Step 3: Minimise Lighting Energy Use





#### LED's & Pendants



Step 4: Minimise Cooking Energy Use





<complex-block>

000

133R

Step 4: Minimise Cooking Energy Use





#### Victorian Av. Home Energy Use

(2015 Residential Baseline Study)

![](_page_42_Picture_0.jpeg)

(2015 Residential Baseline Study)

![](_page_43_Picture_0.jpeg)

## E.

#### Install Solar Photovoltaics

![](_page_44_Figure_3.jpeg)

![](_page_45_Picture_1.jpeg)

#### Install Solar Photovoltaics (4.7kWp system)

![](_page_45_Figure_3.jpeg)

![](_page_46_Picture_1.jpeg)

#### Install Solar Photovoltaics (4.7kWp system)

![](_page_46_Figure_3.jpeg)

![](_page_47_Picture_1.jpeg)

![](_page_47_Figure_2.jpeg)

#### NOW, Use Whole of Home to size PV

 $\overline{7}$ 

Then use the

(WoH) tool...

Whole of Home

7.0

NATIONWIDE HOUSE

107.9 MJ/m<sup>2</sup>

rew nathers gov a

Thermal Shell

![](_page_48_Figure_1.jpeg)

**Net ZERO** 

![](_page_48_Figure_2.jpeg)

#### ⇒ Aim for ZERO!

![](_page_49_Figure_1.jpeg)

#### ⇒ Aim for ZERO!

![](_page_50_Figure_1.jpeg)

#### A. The PV is bit Bigger!

7.0 HOUSE

107.9 MJ/m

ENERGY RATING

![](_page_50_Figure_4.jpeg)

![](_page_50_Picture_5.jpeg)

![](_page_51_Picture_0.jpeg)

![](_page_51_Picture_1.jpeg)

![](_page_52_Picture_0.jpeg)

![](_page_52_Picture_1.jpeg)

![](_page_52_Picture_2.jpeg)

![](_page_53_Picture_0.jpeg)

- \$\$\$
- Comfort & Sanctuary

![](_page_54_Picture_0.jpeg)

- \$\$\$
- Comfort & Sanctuary
- ~8 tonnes CO2/yr

![](_page_55_Picture_0.jpeg)

- \$\$\$
- Comfort & Sanctuary
- ~8 tonnes CO2/yr

#### • 100+ tonnes

(Embodied Carbon Savings)

![](_page_56_Picture_0.jpeg)

- \$\$\$
- Comfort & Sanctuary
- ~8 tonnes CO2/yr
- 100+ tonnes

(Embodied Carbon Savings)

### Walk the well trodden path...

![](_page_57_Picture_0.jpeg)

- \$\$\$
- Comfort & Sanctuary
- ~8 tonnes CO2/yr
- 100+ tonnes

(Embodied Carbon Savings)

## Make *your* Footprints Positive

![](_page_58_Picture_0.jpeg)

# **POSITIVE FOOTPRINTS** Cheese House

Presenter: Jeremy Spencer

![](_page_58_Picture_3.jpeg)

www.positivefootprints.com.au

			\$
Image: Climate file CLIMAT21.txt Product   Start 1 JAN   Day Month   Up Yoth	oject 1 Project 2 Project	Clear All All → ♥ ➤ P1 Outdoor → ♥ ➤ P1 Kitchen Living	

![](_page_60_Figure_1.jpeg)

#### Potential Scores:

4			
	Suggested Strategies	Benefit	Approx. Cost
	Add Blow-in insulation to existing external walls (R1.5 average)	+1.1 stars	\$50/m2
	OR, Reclad existing walls & insulation with R2.7batts plus		This cost \$28900 on a recent job, including
	reflective foil		replacing of weatherboards with more durable
		+1.3 stars	Linea Scyon boards.
	New windows to existing W01-W04	+0.2 stars	\$4000
	Roof insulation to R6.0	+0.05 stars	\$1000
	R2.5 batts to existing subfloor	+0.3 stars	\$3500
	Insulate behind subfloor walls in existing section with R2.0		
	polystyrene board	+0.05 stars	\$950
	Reverse Brick Veneer to KitLiv East & Sth wall	+0.3 stars	\$150/m2
	Reverse Brick Veneer wall to courtyard wall	+0.05 stars	\$150/m2
	Internal brick walls to hall/bed1-bath wall	+0.05 stars	\$150/m2
	Internal brick walls to kitchen/laundry	+0.05 stars	\$150/m2
	Reverse Brick Veneer to existing Living external walls	+0.3 stars	\$150/m2
	Tiles to hall and Bed 1over new slab		Usually slight saving compared to bamboo
		+0.05 stars	overlay currently specified, dependent on tile.
	Make those tiles dark	+0.05 stars	No cost.
	Remove side panel (reduce to 1800 wide) of D13 closest to entry		
	(more shadow from portico.)	+0.1 stars	Saving (~\$500)
	Canvas awnings over D13	+0.05 stars	\$1300 dependent on type. Could be retrofitted.
	Canvas awnings over D12	+0.025 stars	\$1300 dependent on type. Could be retrofitted.
	Upgrade to highest performing windows (Precedence Marvin		Probably around \$10,000.
	Integrity)	+0.3 stars	Will require a quote
	Add insulative curtains and pelmets, or slimline head fixed	Usually about	Depends on type. Usually not a cheap exercise
	insulative curtains and pelmets, or slimline head fixed Usually about Depends on type. Usually not a cheap ex ited type (Eg. Luxaflex Duette blinds). 1 degree. for quality curtains.		for quality curtains.
	Note: Regulators have deemed that as curtains can change with		
	fashion over time they are not included in rating mode in any of		
	the rating softwares. Curtains however do give significant		
	improvements, even for high performance windows - where the		
	occupants actually use them!		

Generated on 08	Oct 2020 using Ac	uRate Sustainability V2.4.3.21	7	1 0	
Property			A	tas	
Address	11 Youngman S	NATIO	NWIDE		
	3072		HOUSE		
LotDP	Lot 43		ENERGY RATE	ING SCHEME	
NCC Class*	1002		2.0		
Туре	Renovation		71.0 MJ/m <sup>2</sup>		
Plans					
Main Plan	11000000		The more information on		
Prepared by	Positive Footpri	0,3072	www.nath	www.nathers.gov.au	
2000	0527		And in case of the local division in which the		
Constructio	on and envir	onment	Thermal performance		
Assessed floor a	rea (m²)*	Exposure Type	Heating	Cooling	
Conditioned*	150.0	Suburban	55.9	16.1	
Unconditioned*	16.4	NatHERS climate zone	M.Vm <sup>2</sup>	MJ/m²	
lotal	166.4	21			
Garage					
Accredited assessor			About the rating NatHERS software models the experiment thermal energy loads using information and communication and communication		
Name	Jeremy:	spencer J Z U U U U C	and common patient	and common patients of household use The software does not take into accour appliances, apart from the airflow impa from ceiling fans.	
Business name	Postve	Footpents MANIC	The software does n appliances, apart fro		
Email	( Jeven AG	positivefootprints.com.au	from ceiling fans.		
Phone	(03) 931	50566 20	Verification		
Accreditation No. VIC/BDA		V/10/0014	To verify this	2644	
Assessor Accred	iong Organisation		certificale, scan the	643	
Declaration of int	erest Employs	d by designer of the building	hstar.com.au/QR/Ge p=TMdzgqZgu When using either lin	nerato? k. ensure you ar	
National Constru The NCC's requirement dataled in J02 and J0 In NCC 2019, these re sportments through th Invited to insulation in	iction Code (NCC) its for NathERS-rated to 55 all of the NCC Value repartments include to NATERS autoemain statilation methods, the	requirements unes an estained in 3, 12, 0(a)) and 3, 12,5 of the e One. Investments additional to the NathErS asses Registerests additional to the NathErS asses	NCC Volume Two. For apartment is load immits that need to be mail also be satisfied imping, and artificial lighting requir	y buildings and include, but are not enserts. The NCC	

This means 2 Ratings each Job...

#### Climate Change is here, now

![](_page_62_Picture_1.jpeg)

![](_page_62_Figure_2.jpeg)

![](_page_62_Picture_3.jpeg)

#### Limit Uncontrolled Infiltration

![](_page_63_Figure_1.jpeg)

CSIRO: House Energy Efficiency Inspections Project 2015

#### Limit Uncontrolled Infiltration

![](_page_64_Figure_1.jpeg)

CSIRO: House Energy Efficiency Inspections Project 2015

## What Rating is your Home?

![](_page_65_Figure_1.jpeg)

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