

# JOSH'S HOUSE: YEAR 1 PERFORMANCE REPORT



## Problem

The built environment in Australia is currently responsible for around a quarter of the nation's greenhouse gas emissions and half of this is from residential dwellings. Minimum energy efficiency standards are included in the Building Code of Australia (BCA), which currently requires that all new residential buildings achieve a 6-star rating for thermal performance. Obstacles for the adoption of stricter regulations on residential energy efficiency, and in particular Zero Emission Houses (ZEH), include an absence of regulatory incentives, a lack of consumer awareness and demand, a lack of capacity within industry and the perception that ZEH are not affordable.

Josh's House has annual emissions of 1,989 kgCO<sub>2</sub>e, which is 72% lower than the Perth average. The on-site PV generation results in annual offsets of 3,324 kgCO<sub>2</sub>e, making the house 'carbon positive' on an operational basis.

## Solution

Josh's House is an innovative two-lot, 10 Star housing project in the suburb of Hilton, Western Australia which aims to demonstrate that high performance energy efficient homes can be built at comparable cost and timeframes to regular houses, using readily available knowledge, materials and mainstream trades.

The houses were completed in June 2013, within a six month construction period and for a build rate of \$1,200 per square meter. One of the homes is now occupied by Josh Byrne and his family. A monitoring system has been installed with sensors to monitor local weather conditions; internal room temperatures, as well as concrete slab, ceiling, roof cavity and roof surface temperatures; metering of all water sources (mains, rainwater, greywater, and bore); as well as gas and electrical supply (grid and roof top PV system) and their respective sub metered usage.

The results are being shared along with the rest of Josh's journey through an intensive, open source communications and community engagement program accessible via [www.joshshouse.com.au](http://www.joshshouse.com.au)

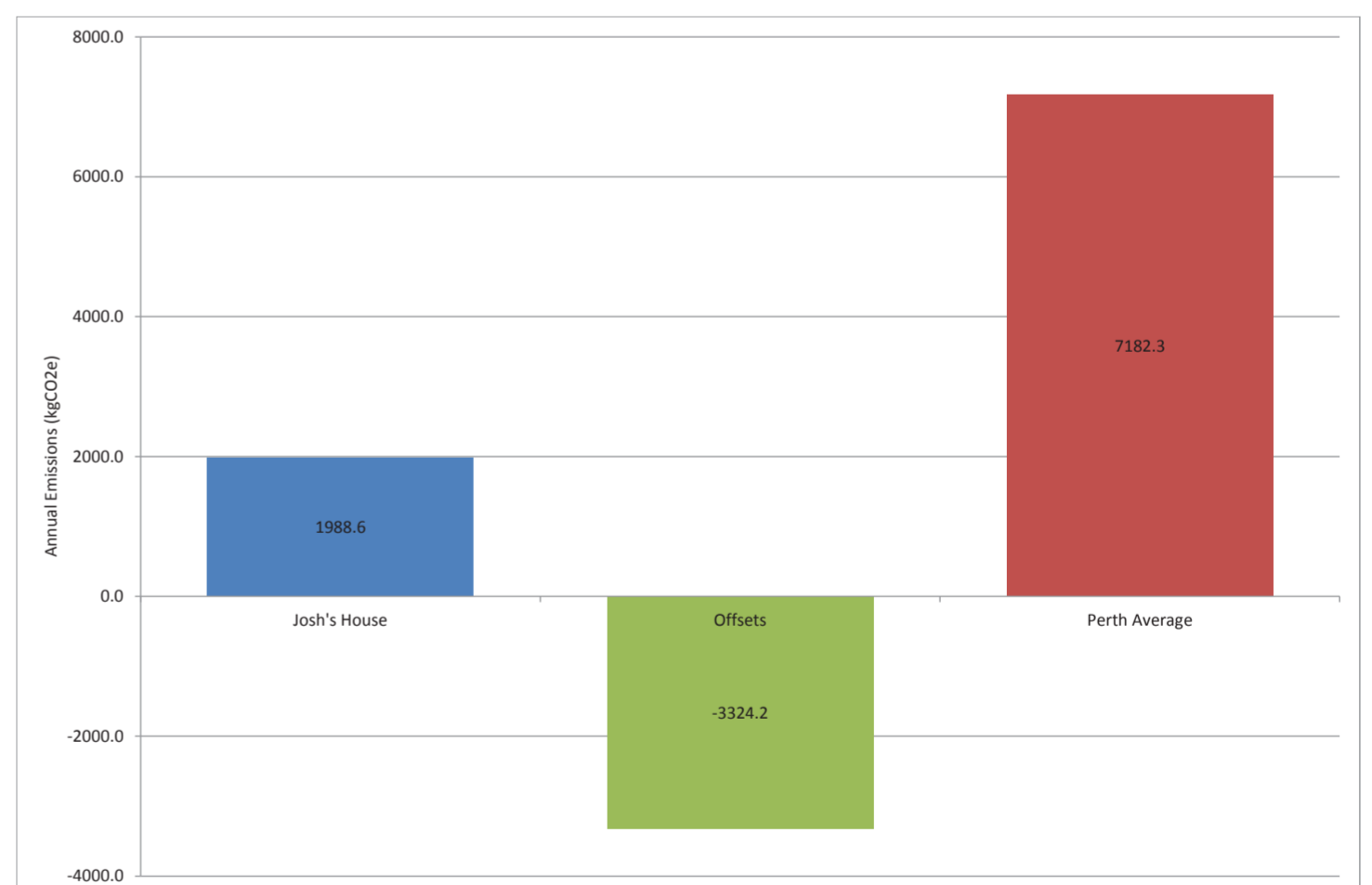
Table 1: Seasonal thermal performance of living room and bedrooms

Summer (28/01 - 28/02/2014)						
Room	Average (°C)	Std Dev (°C)	Maximum (°C)	Minimum (°C)	Number of days under 18°C	Number of days over 28°C
Master Bed	25.57	1.34	29.24	21.95	0	5
Bedroom 2	25.05	1.14	27.75	22.03	0	0
Bedroom 3	24.97	1.02	27.26	22.3	0	0
Living Room	24.93	1.65	28.47	19.96	0	0
Autumn (01/03 - 31/05/2014)						
Room	Average (°C)	Std Dev (°C)	Maximum (°C)	Minimum (°C)	Number of days under 18°C	Number of days over 28°C
Master Bed	23.18	1.89	28.72	18.49	0	5
Bedroom 2	22.49	1.9	27.63	18.35	0	0
Bedroom 3	22.85	1.57	27.06	19.39	0	0
Living Room	23.42	1.56	28.27	18.8	0	3
Winter (01/06 - 30/06/2014)						
Room	Average (°C)	Std Dev (°C)	Maximum (°C)	Minimum (°C)	Number of days under 18°C	Number of days over 28°C
Master Bed	19.28	1.54	23.99	15.81	15	0
Bedroom 2	18.99	1.44	21.67	15.02	12	0
Bedroom 3	19.47	1.15	21.98	17.12	8	0
Living Room	20.74	1.65	25.43	17.13	8	0

## Benefits

In addition to good thermal performance and being GHG positive, Josh's House is a net energy exporter, resulting in an annual savings of around \$1,500 in electricity bills compared to the Perth average. The house also uses 89% less natural gas than the Perth average with a cost saving of \$566 and 92% less scheme water resulting in an annual saving of \$560.

Figure 1: Annual greenhouse gas emissions at Josh's House compared to Perth average



## Contact

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