

# RP3009: High Performance Housing Monitoring, Evaluating & Communicating the Journey

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## Research Team:

Peter Newman, Josh Byrne & Christine Eon

**Start Date:** 1 June 2013

**Finish Date:** 30 June 2016

## Project Partners:

Curtin University

University of South Australia

Josh Byrne & Associates

*“High performance housing doesn’t have to be expensive or complicated”*



# Communications Plan



## YEAR 1

Demonstrate that high performance, net zero energy housing is readily available to the volume market via a real-life build.



## YEAR 2

Showcase other examples from around Australia to generate national interest.



## YEAR 3

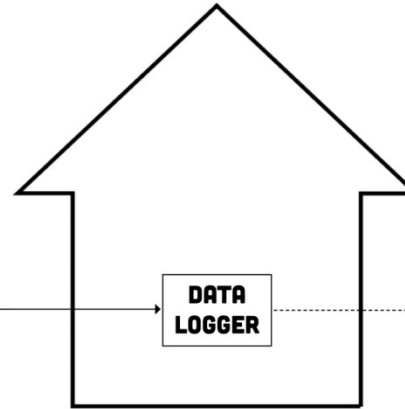
Investigate the impact of resident behavior vs design on household energy use and carbon emissions.

# Learnings: Performance Monitoring & Data Sharing

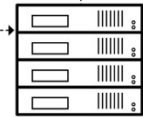
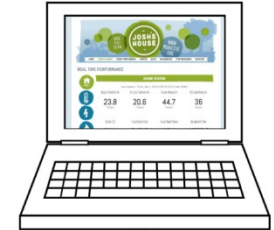


## INFORMATION INPUTS

- Electrical Circuit Meters
- Internal Temperature Sensors
- Internal Relative Humidity Sensor
- Internal CO<sub>2</sub> Sensor
- Water Meters
- Gas Meters
- Weather Station
- Irradiance Sensors
- Soil Moisture Sensor
- Rainwater Tank Level Sensor



## JOSH'S HOUSE WEBSITE



## DATA BASE SERVER

[joshshouse.com.au/about-the-project/real-time-performance](http://joshshouse.com.au/about-the-project/real-time-performance)



## HOUSE STATUS

Last Updated : Thursday, November 19, 2015 12:20 PM (Perth time +8:00)

INSIDE TEMPERATURE	OUTSIDE TEMPERATURE	INSIDE HUMIDITY	OUTSIDE HUMIDITY
22.1 °Celsius	23.4 °Celsius	51.9 Percent	41.1 Percent
BATTERY CHARGE	SOLAR RADIATION	SOLAR POWER TODAY	RAINWATER TANK
89 Percent (8kWhrs)	1184 Watts per m2	10.2 Kilowatt hours	62 Percent (20kL)
WIND SPEED	WIND DIRECTION	RAINFALL TO 9AM	RAINFALL TODAY
7.2 km per hour	SW	0.3 Millimetres	0 Millimetres



## TEMPERATURE

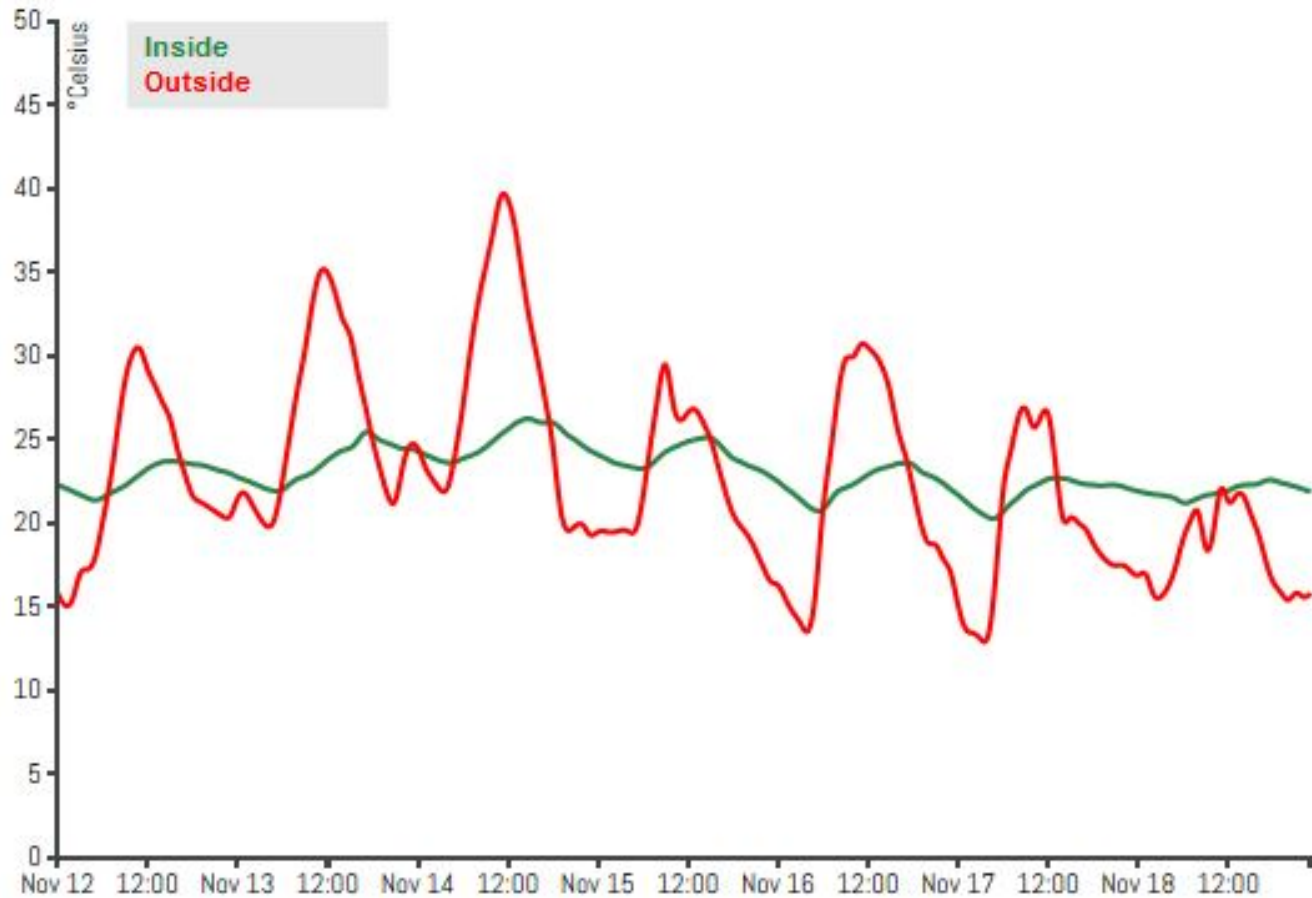
Inside - Outside

Vertical Profile

Day

**Week**

Year

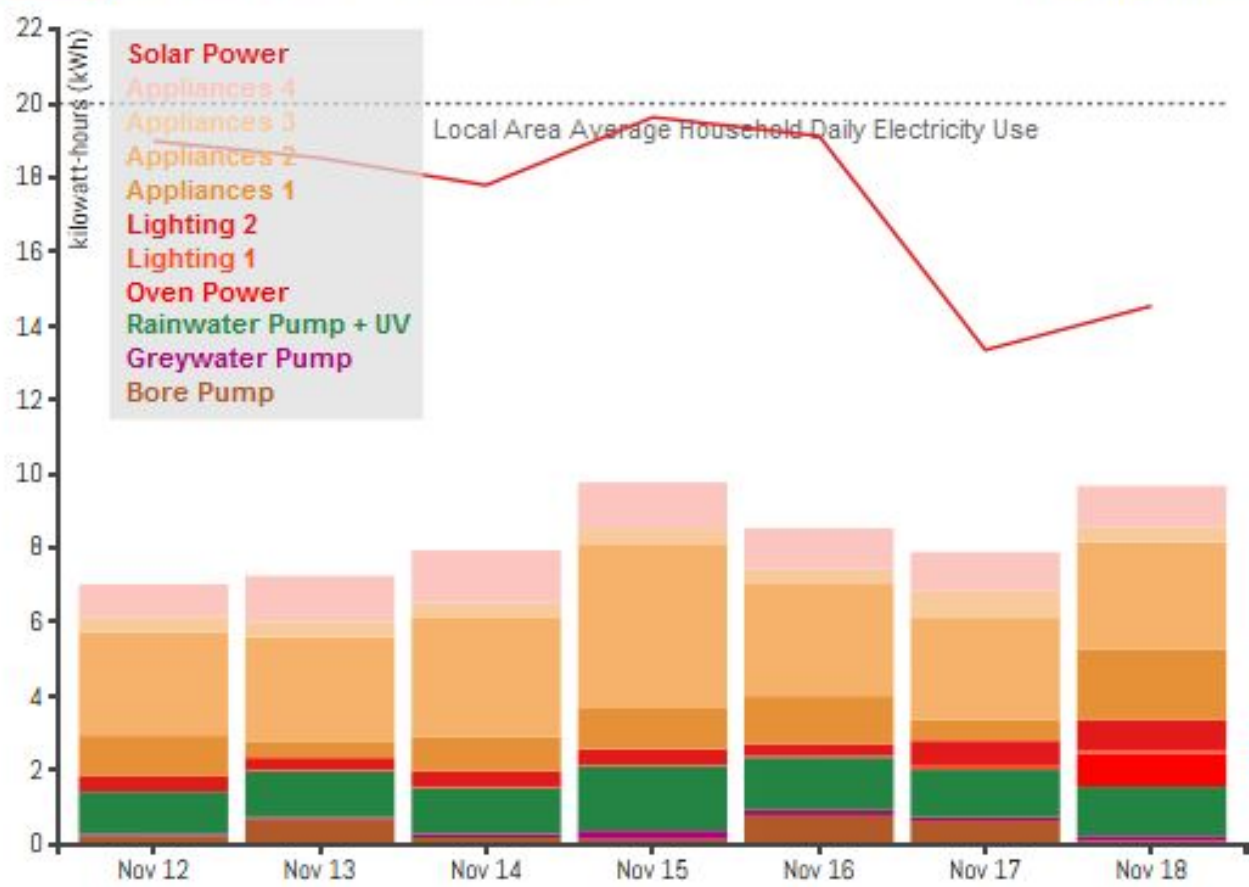




# ELECTRICITY USAGE

Demand
Before/After Battery
Sources vs Loads

Daily
Weekly





## ELECTRICITY USAGE

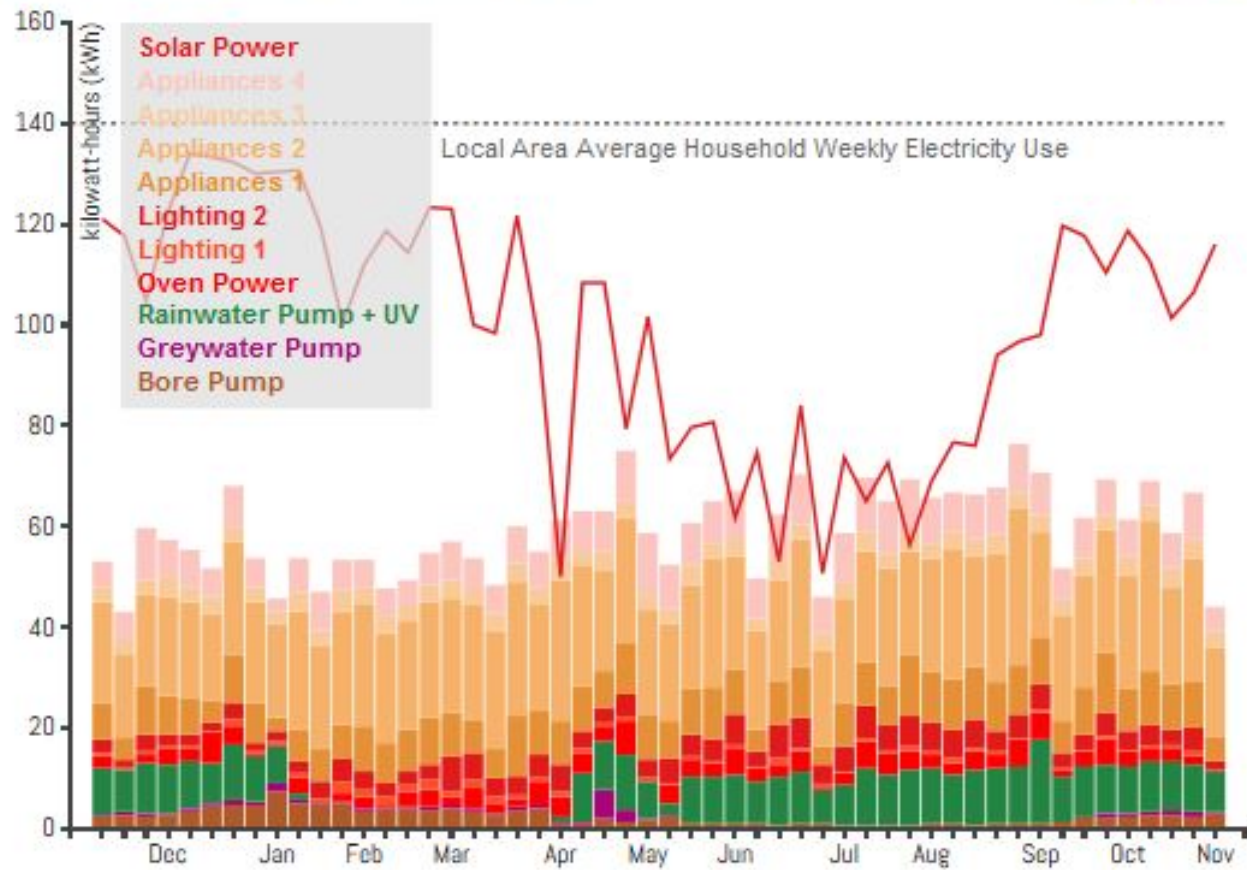
Demand

Before/After Battery

Sources vs Loads

Daily

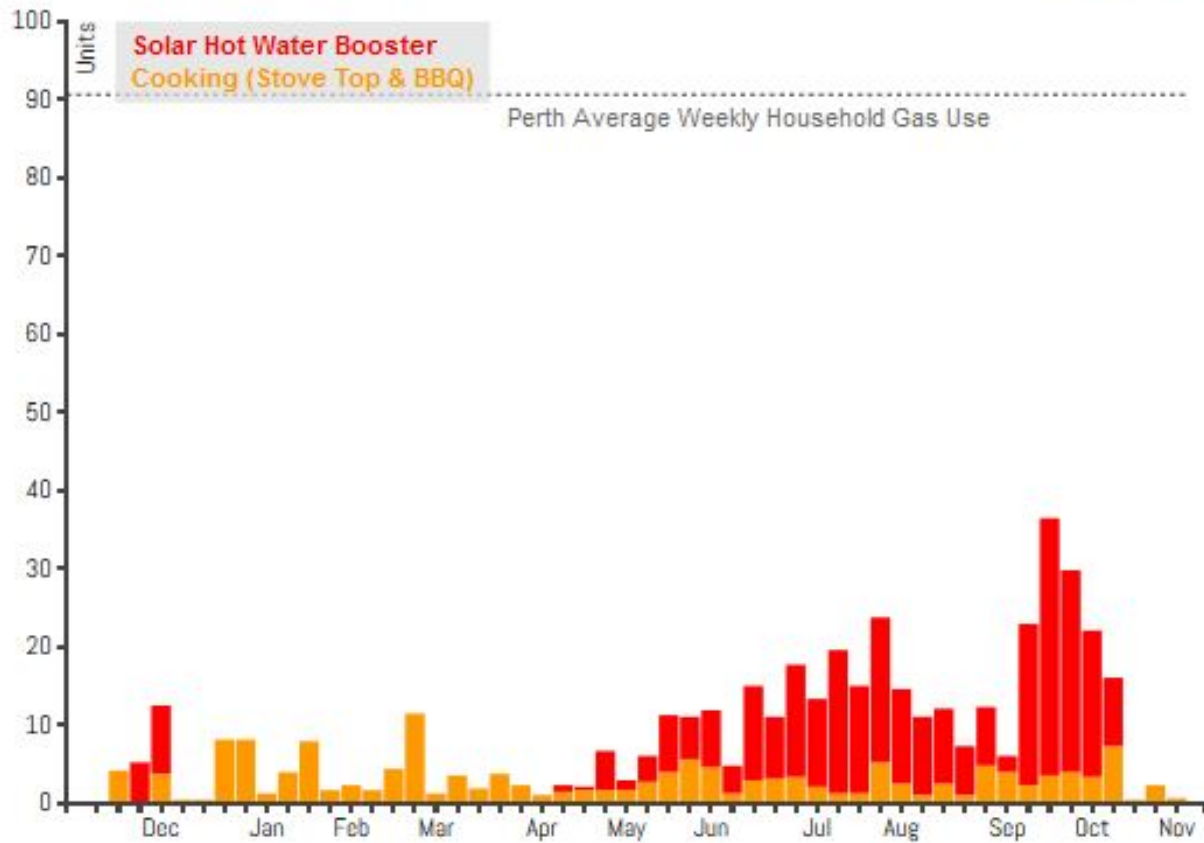
Weekly





## GAS USAGE

Daily Weekly

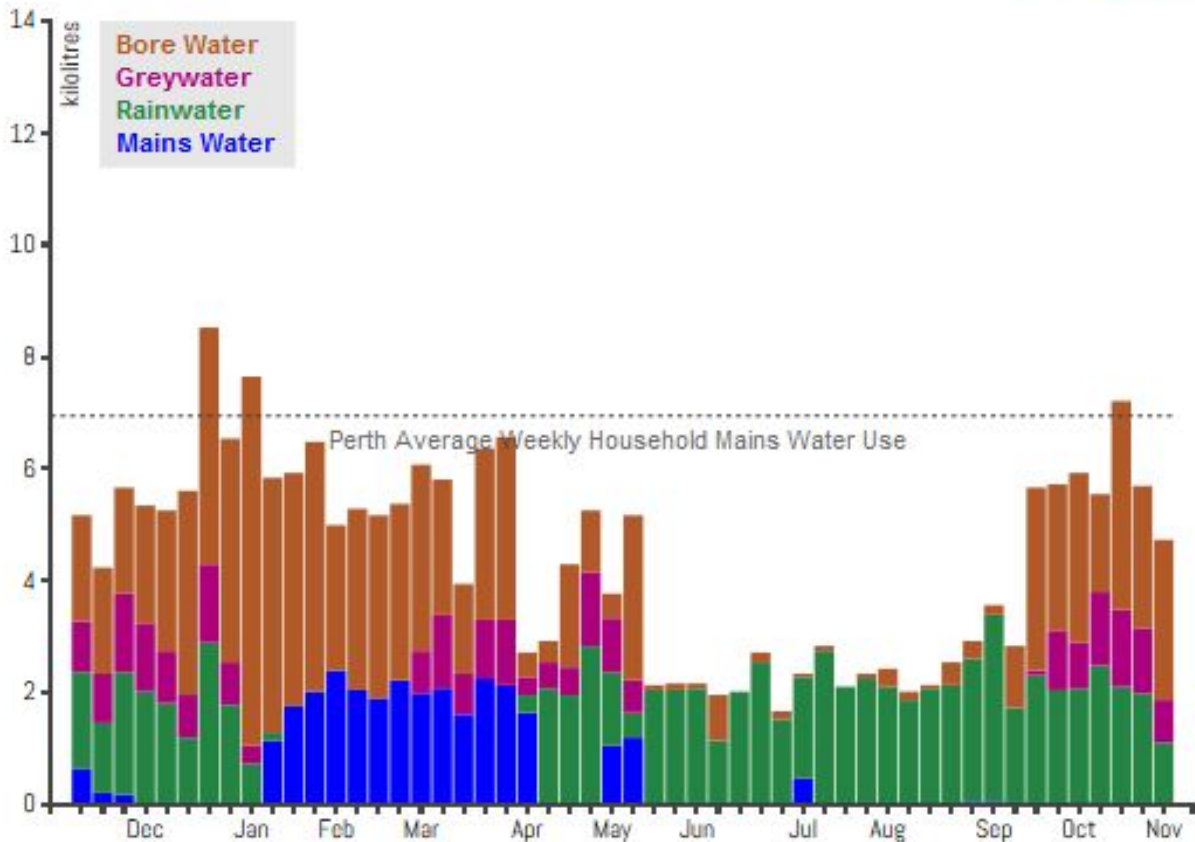






# WATER USAGE

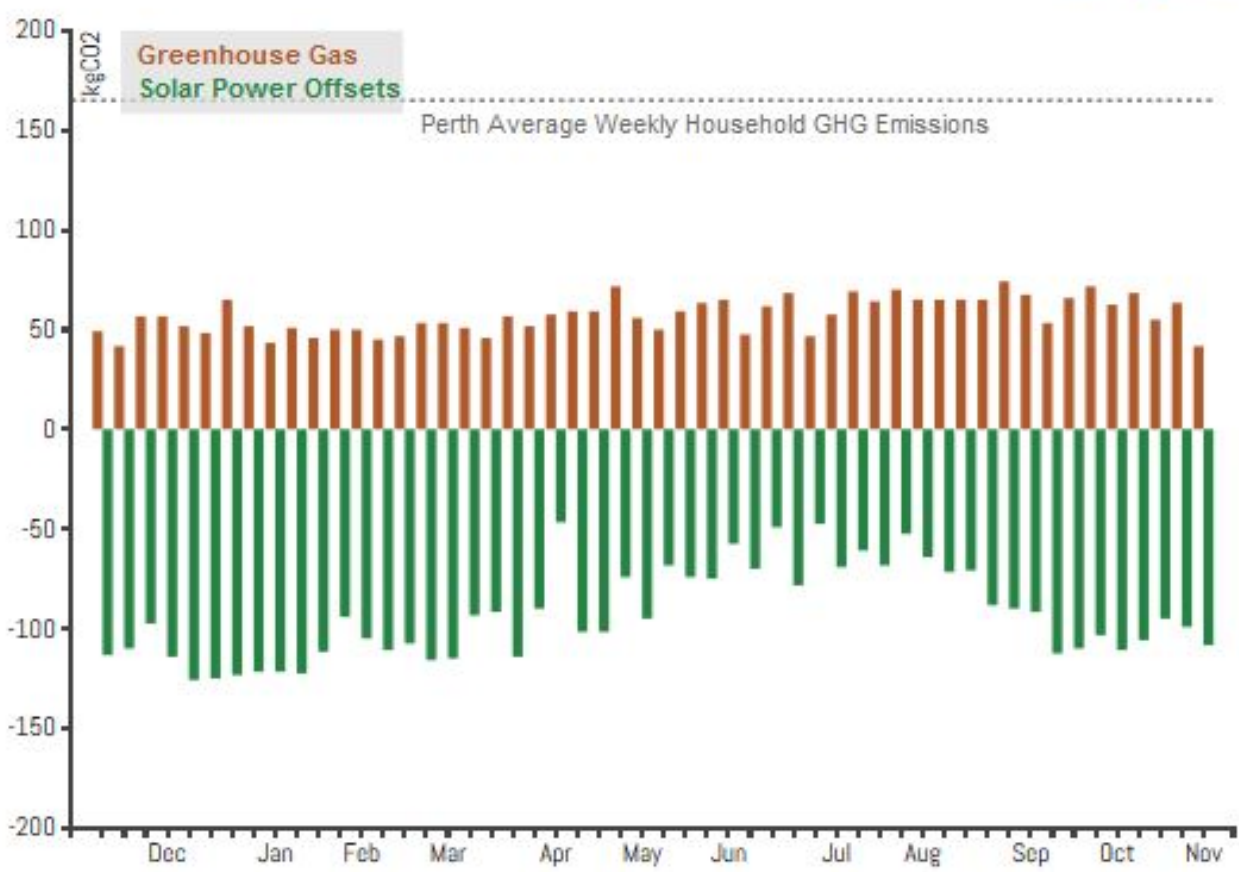
Daily **Weekly**



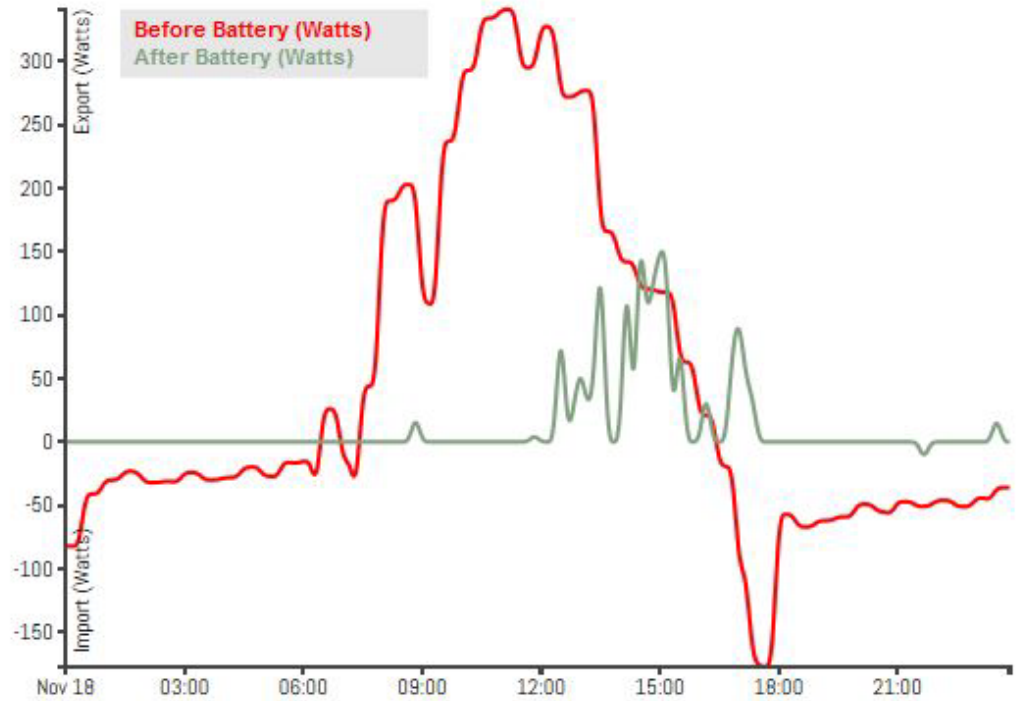


# GREENHOUSE GAS EMISSIONS

Daily **Weekly**



# Learnings: Grid Integrated PV-Battery Storage



# RP3033: Mainstreaming Low Carbon Housing Precincts the WGV Living Laboratory

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## Research Team:

Peter Newman, Josh Byrne, Vanessa Rauland & Tanya Babaeff

**Start Date:** 1 July 2015

**Finish Date:** 30 June 2019

## Project Partners:

Curtin University

LandCorp

City of Fremantle

Josh Byrne & Associates

*“Mainstreaming low  
carbon residential  
precincts through  
strategic alignment of  
objectives and actions”*





# Dwelling Typologies

- 23 detached houses
- 8 townhouses
- 3 apartment buildings (37 units)
- SHAC building (12 studio style apartments)



## Gen Y Demonstration Housing Project

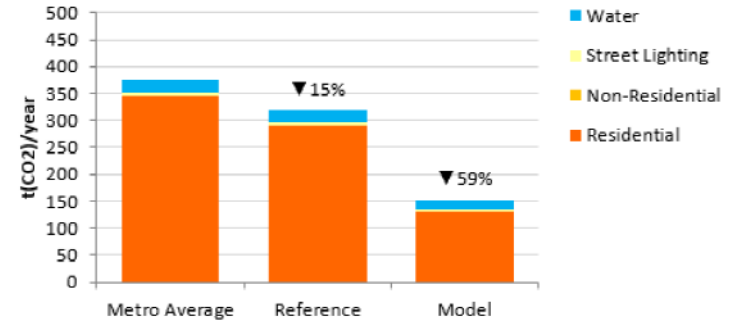
- 3 units
- Timber frame
- Carbon neutral LCA
- Shared PV and LiFe batteries
- Shared rainwater (non-potable)



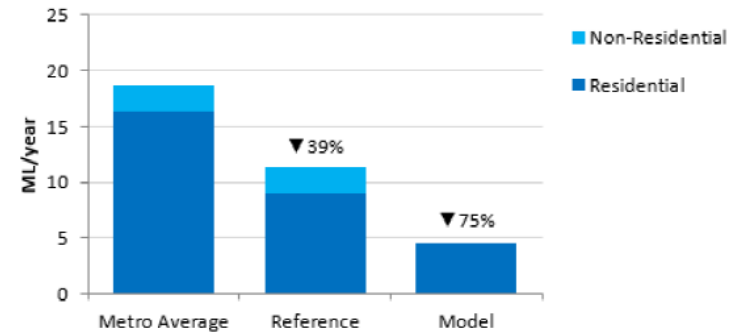
# Sustainability Framework & Performance Targets

-  zero carbon
-  zero waste
-  sustainable transport
-  local and sustainable materials
-  local and sustainable food
-  sustainable water
-  natural habitats and wildlife
-  culture and heritage
-  equity and fair trade
-  health and happiness

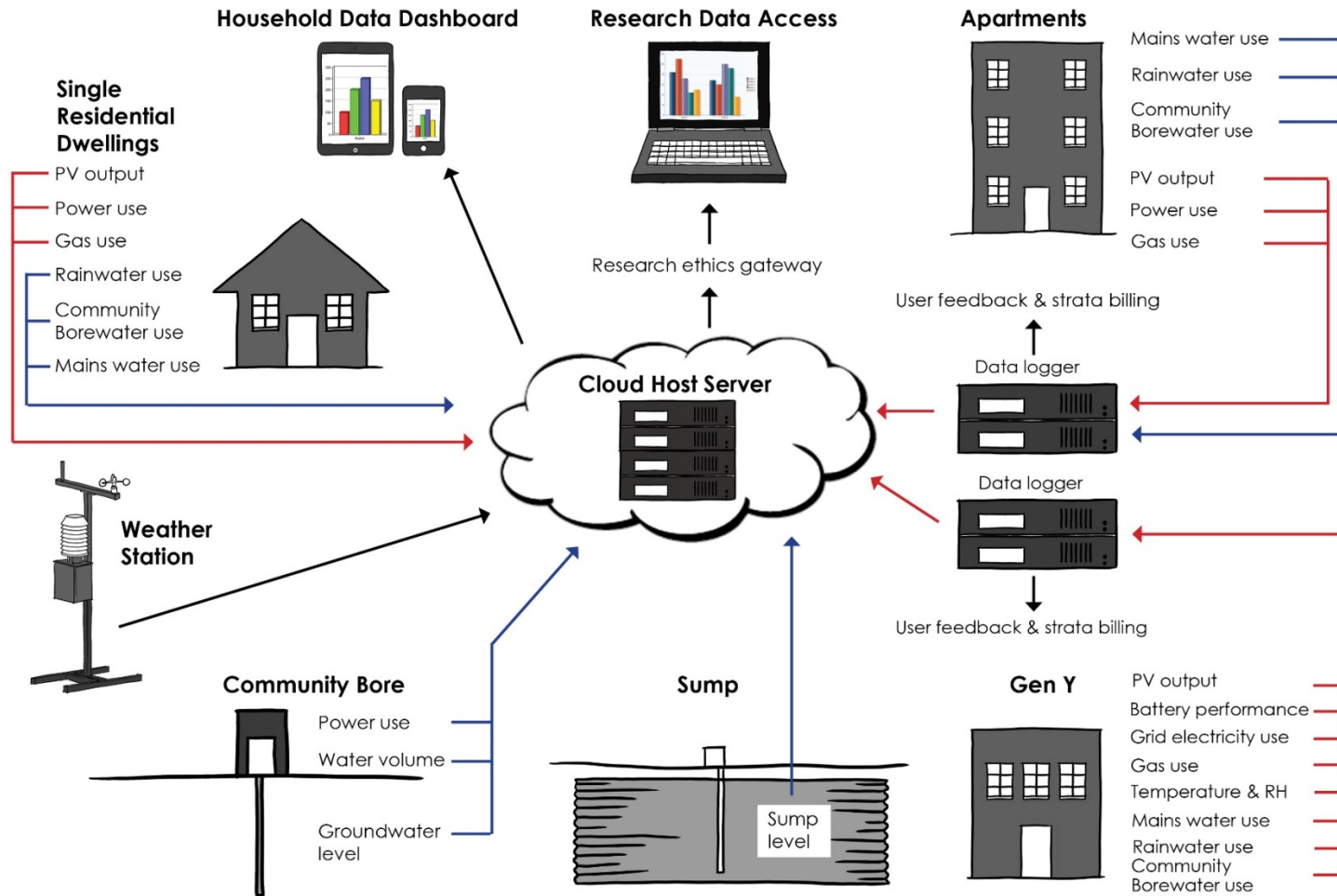
## ENERGY (GREENHOUSE GAS EMISSIONS)



## WATER



# Performance Monitoring & End-user Feedback





## RP3009: HIGH PERFORMANCE HOUSING

w: [joshshouse.com.au](http://joshshouse.com.au)

fb: [joshshouse10star](https://www.facebook.com/joshshouse10star)

tw: [joshshouse10](https://twitter.com/joshshouse10)

ig: [joshshouse10](https://www.instagram.com/joshshouse10)

## RP3033: MAINSTREAMING LOW CARBON PRECINCTS

w: [landcorp.com.au/innovation/wgv](http://landcorp.com.au/innovation/wgv)

[#innovationwgv](https://twitter.com/innovationwgv)