



LOW CARBON LIVING
CRC

Mainstreaming Zero Energy Housing: From House to Precinct

Dr Josh Byrne

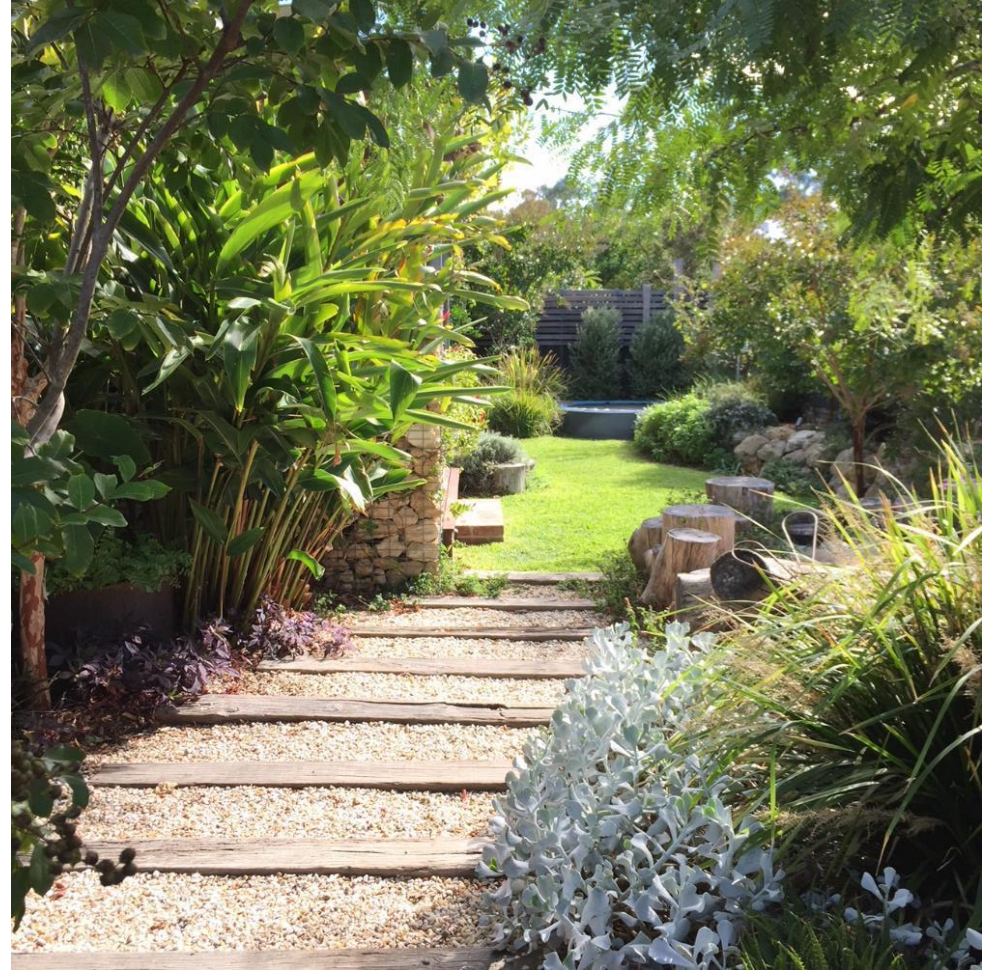


Curtin University

JOSH'S HOUSE

Hilton, WA





Solar Energy

SHWS, PV's + Battery

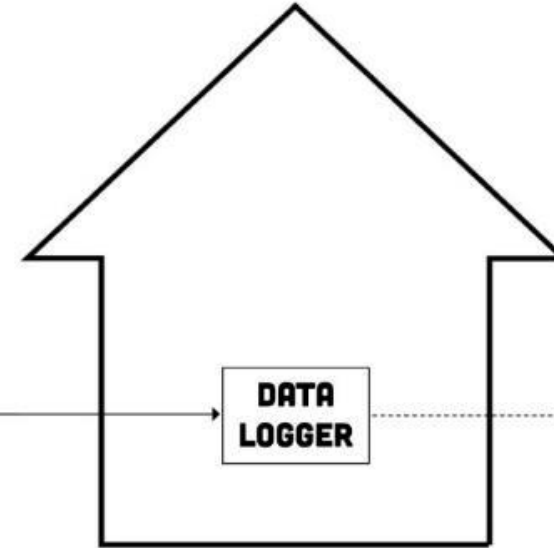


Performance Monitoring



INFORMATION INPUTS

- Electrical Circuit Meters
- Internal Temperature Sensors
- Internal Relative Humidity Sensor
- Internal CO₂ Sensor
- Water Meters
- Gas Meters
- Weather Station
- Irradiance Sensors
- Soil Moisture Sensor
- Rainwater Tank Level Sensor

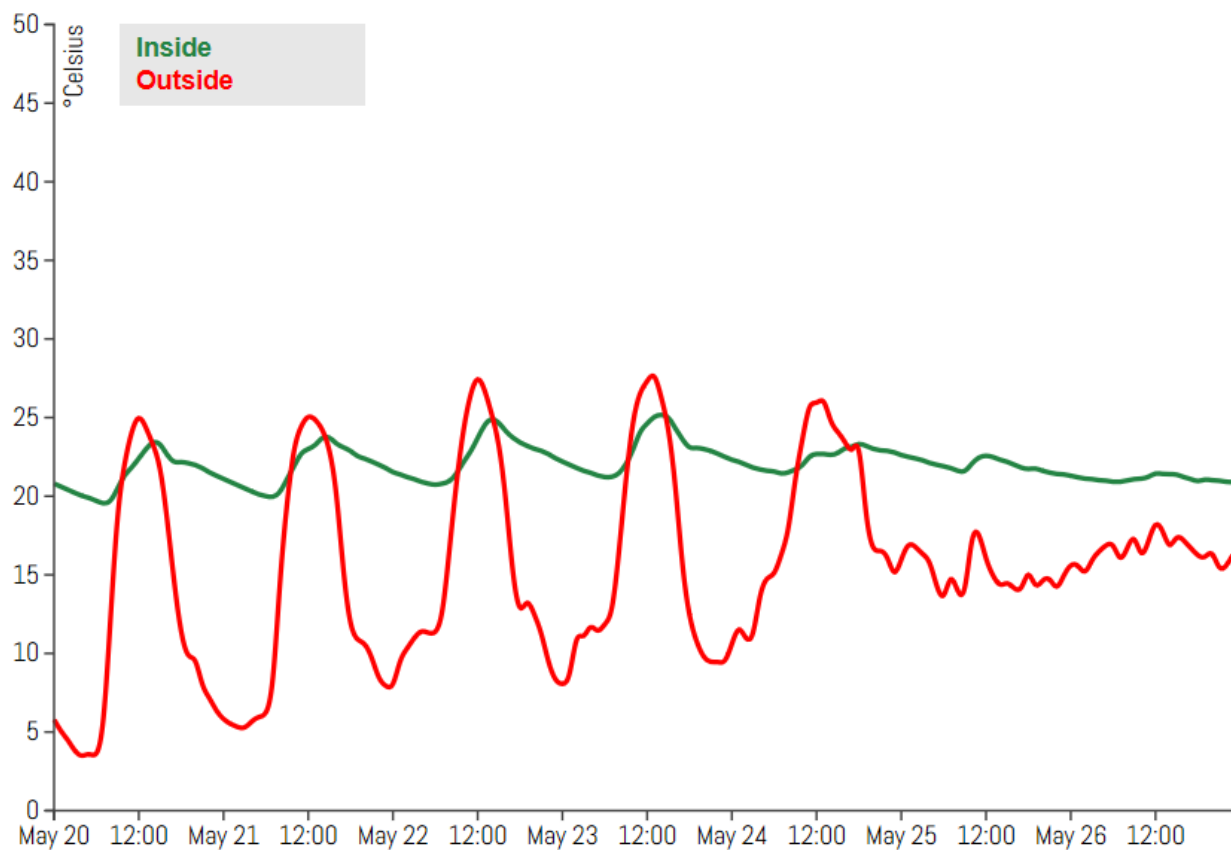


JOSH'S HOUSE WEBSITE

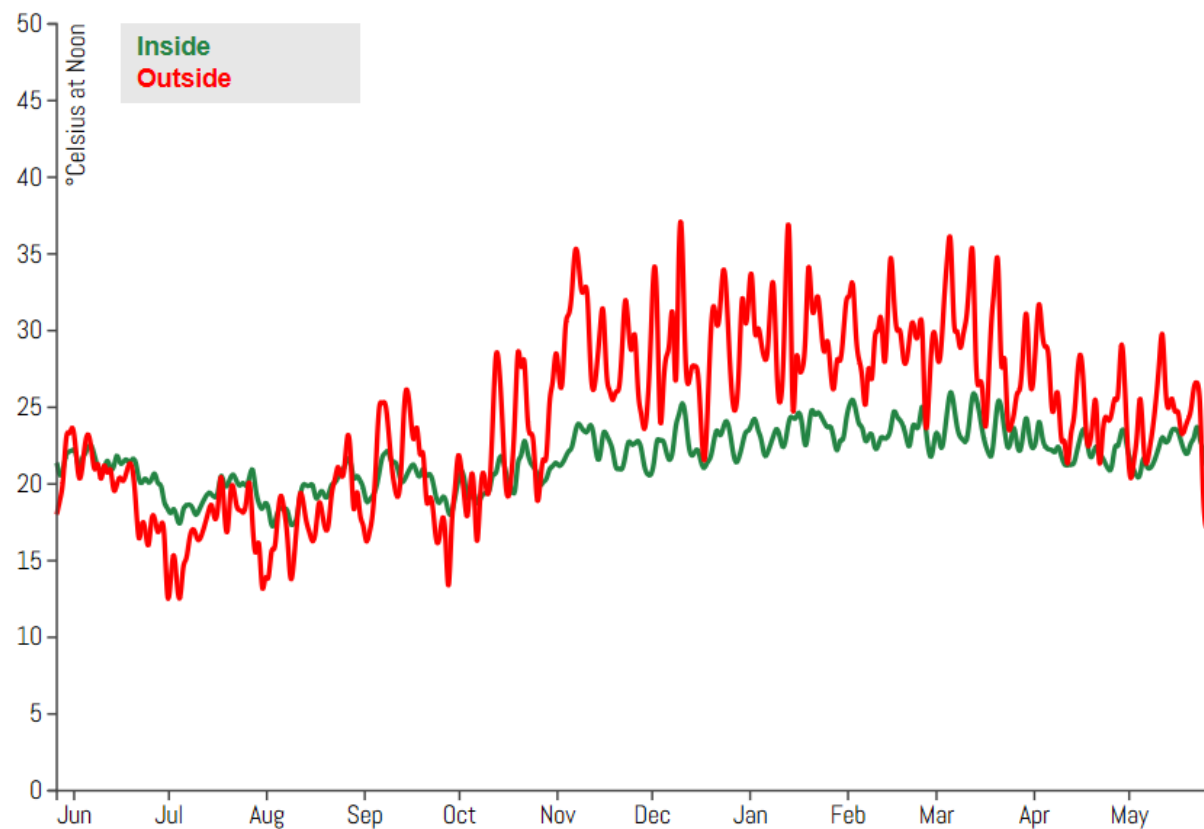


DATA BASE SERVER

Temperature

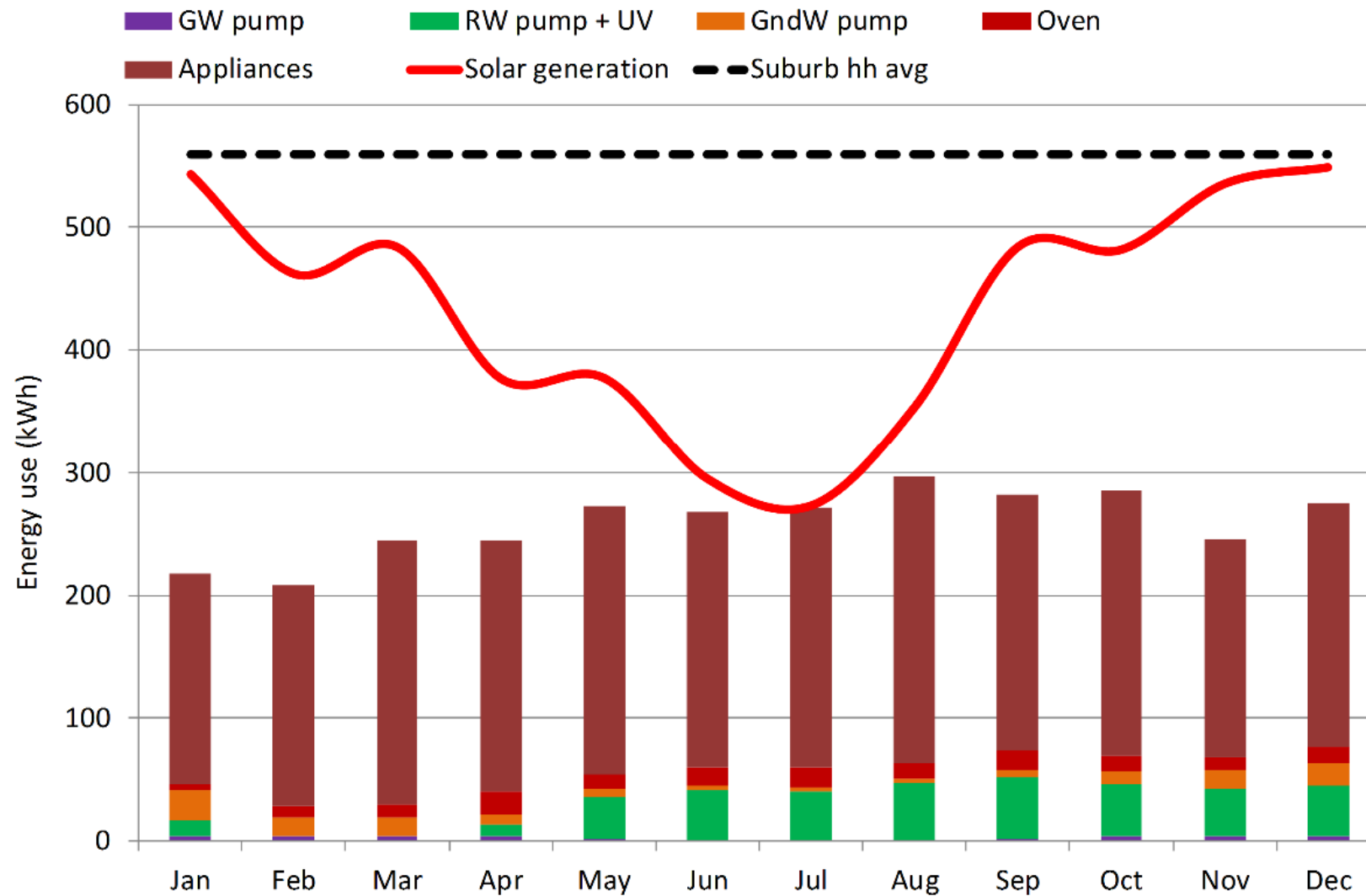


Weekly Profile

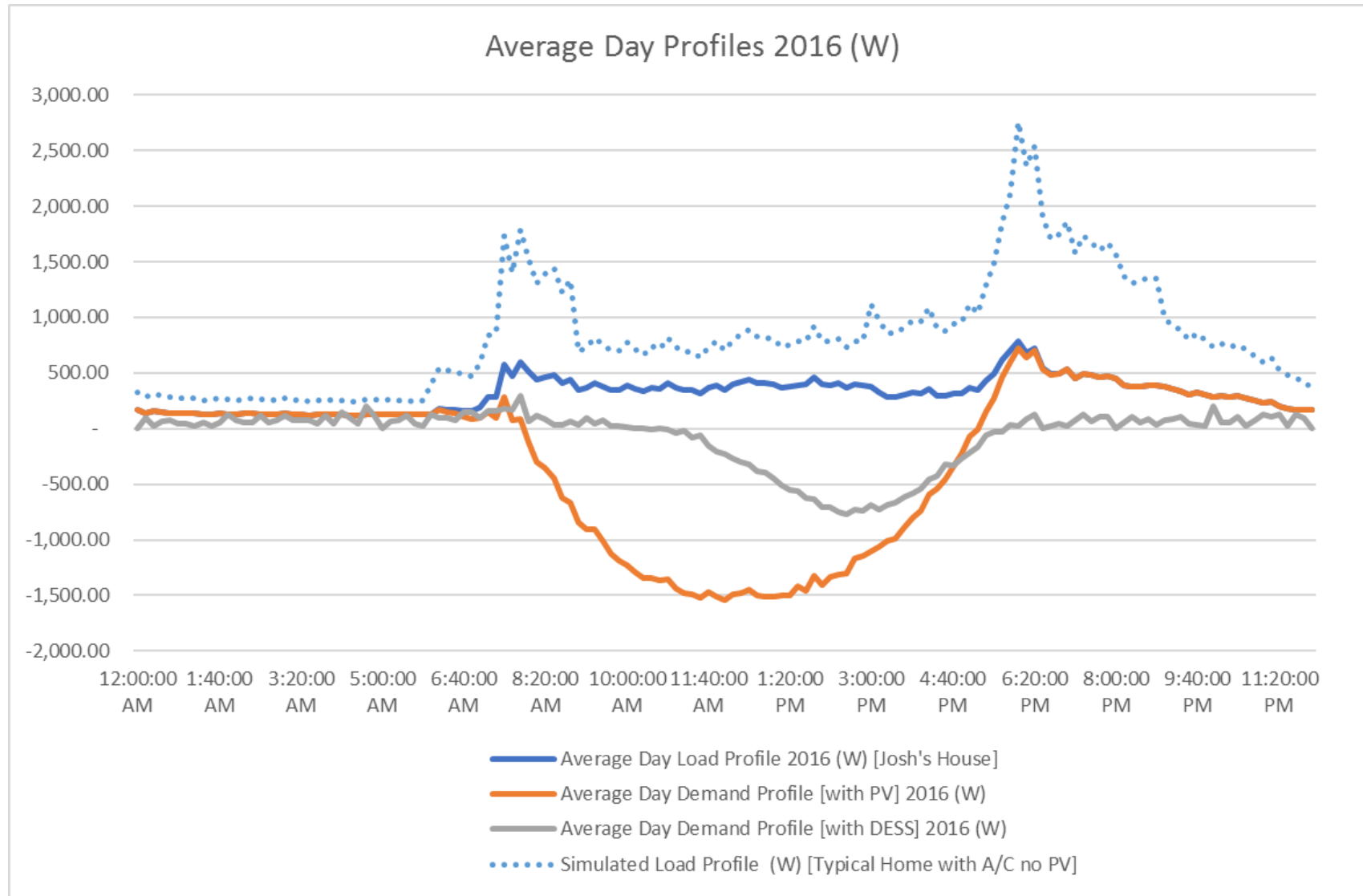


Year Profile

Electricity Use & Production



Electricity Use Profile: High Performance House + Solar + Battery



Solar – Electric Upgrade

Induction Cooktop & Heat Pump HWS



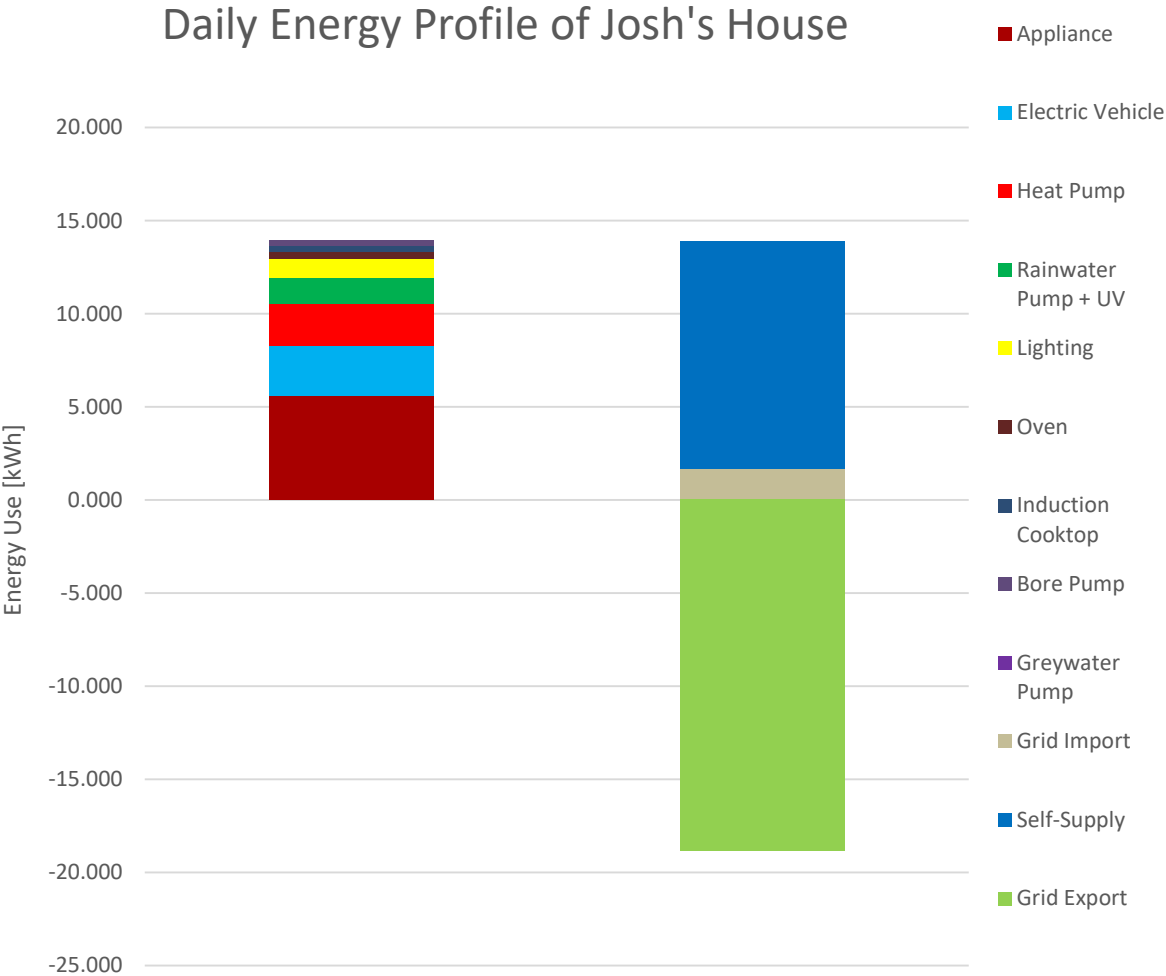
Electric Vehicle



Increased PV, Inverter & Battery



Performance & Payback



SOURCE	FIGURE	UNIT
Energy Produced	10,782	kWh/Yr
Imported from the Grid	638.75	kWh/Yr
Self-Supply	5,403.85	kWh/Yr
Energy Exported	4,739	kWh/Yr
Annual Savings from Self Supply	\$1,530.76	AUD
Annual Income from Grid Export	\$338.13	AUD
Annual Savings from EV	\$1,665.56	AUD
Total Savings	\$3,534.45	AUD
Total Investment	\$31,100.00	AUD
Payback Period	8.8	Years

WGV by LANDCORP

White Gum Valley, WA



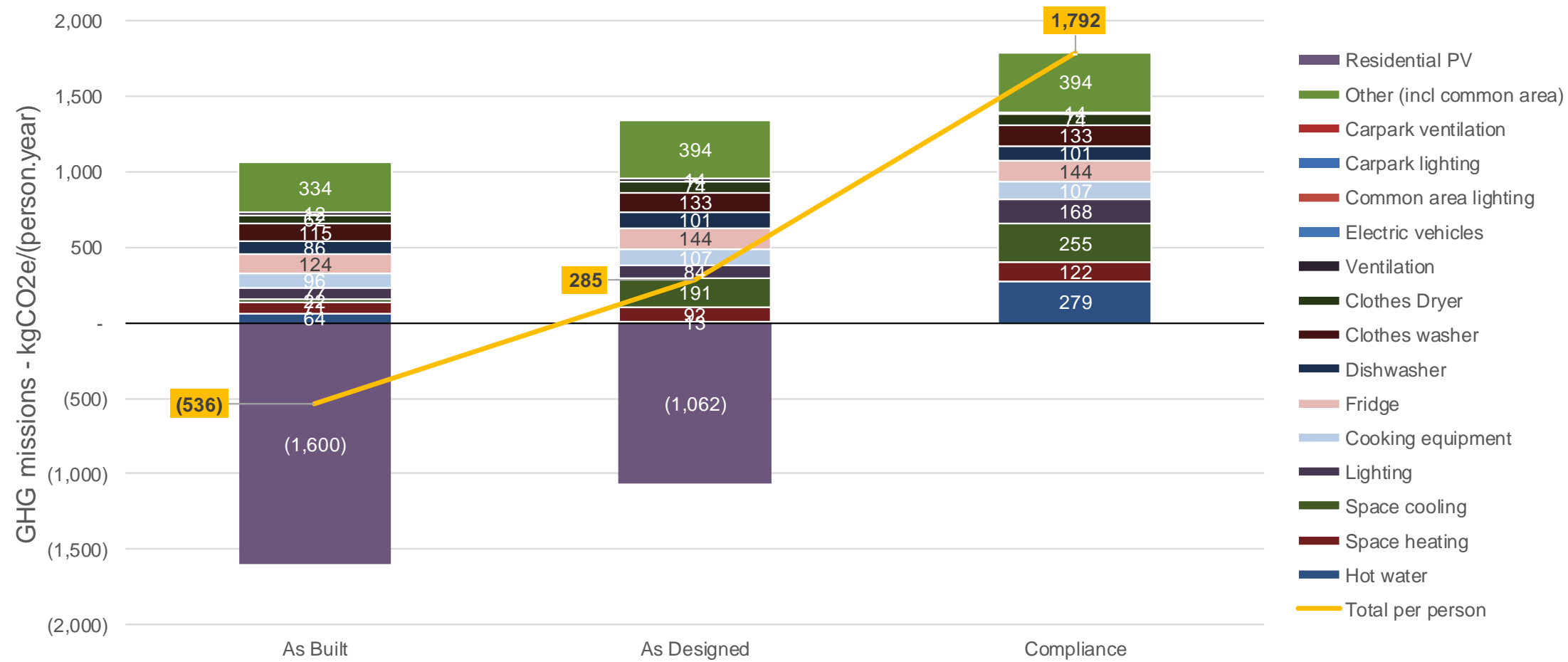


Single Residential – Design Guidelines

Design Guideline Design Controls	
NatHERS	Minimum 7 star
Dwelling design	Over shadowing, orientation, layout & cross ventilation assessed pre DA
PV generation	Minimum 1.5kW (upgraded to 3.5kW via developer contribution)
Hot water	Solar or heat pump min. 5 Stars
Air conditioning	Minimum 3 Star
Drying court	Mandatory
Landscaping	Space allowance for trees (advanced shade tree via developer contribution)



GHG Emissions – As Designed Vs As Built



Credit: Kinesis

Multi Residential Gen Y House by LandCorp



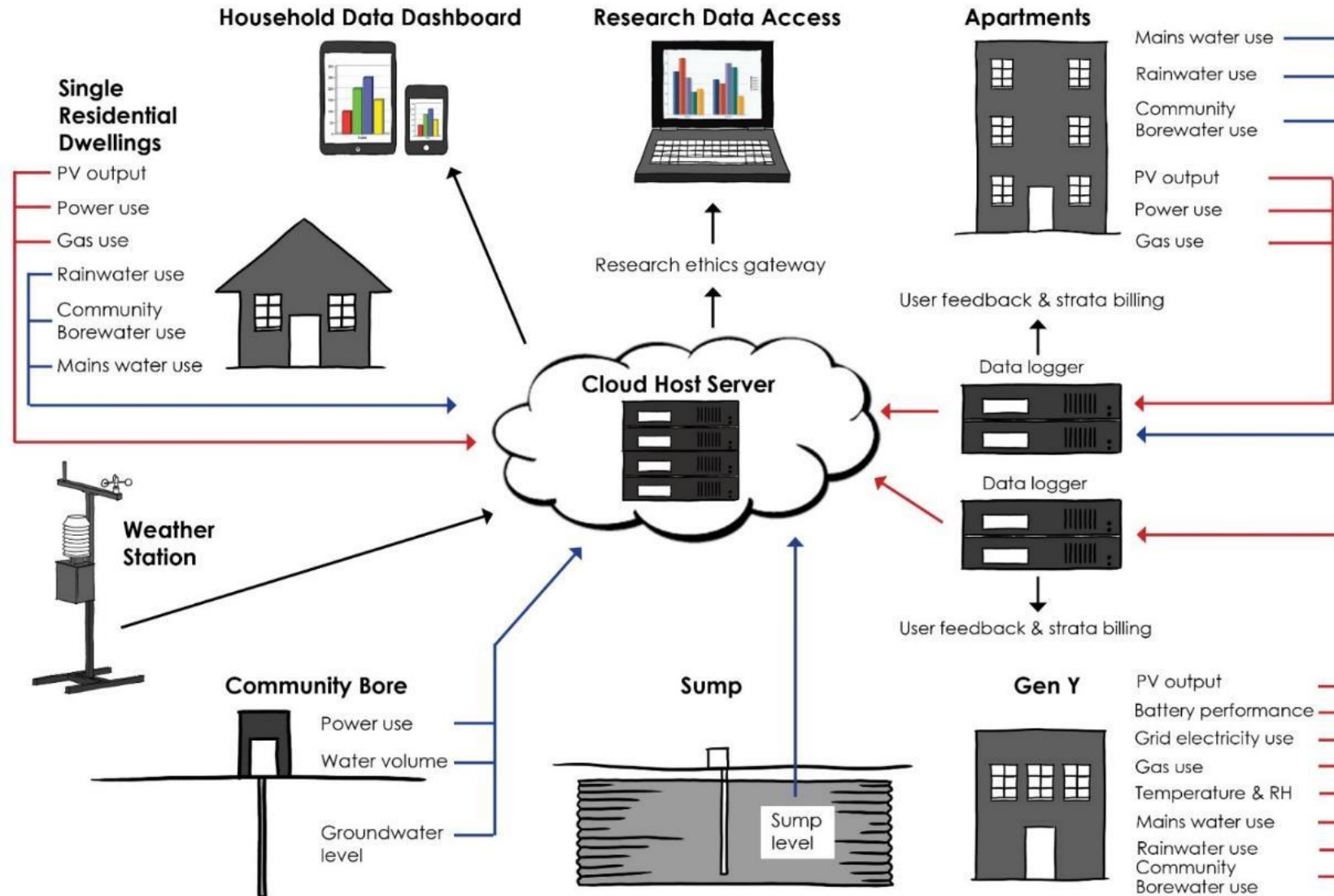
Design Credit: David Barr Architects / LandCorp

Multi Residential Evermore by Yolk Property Group

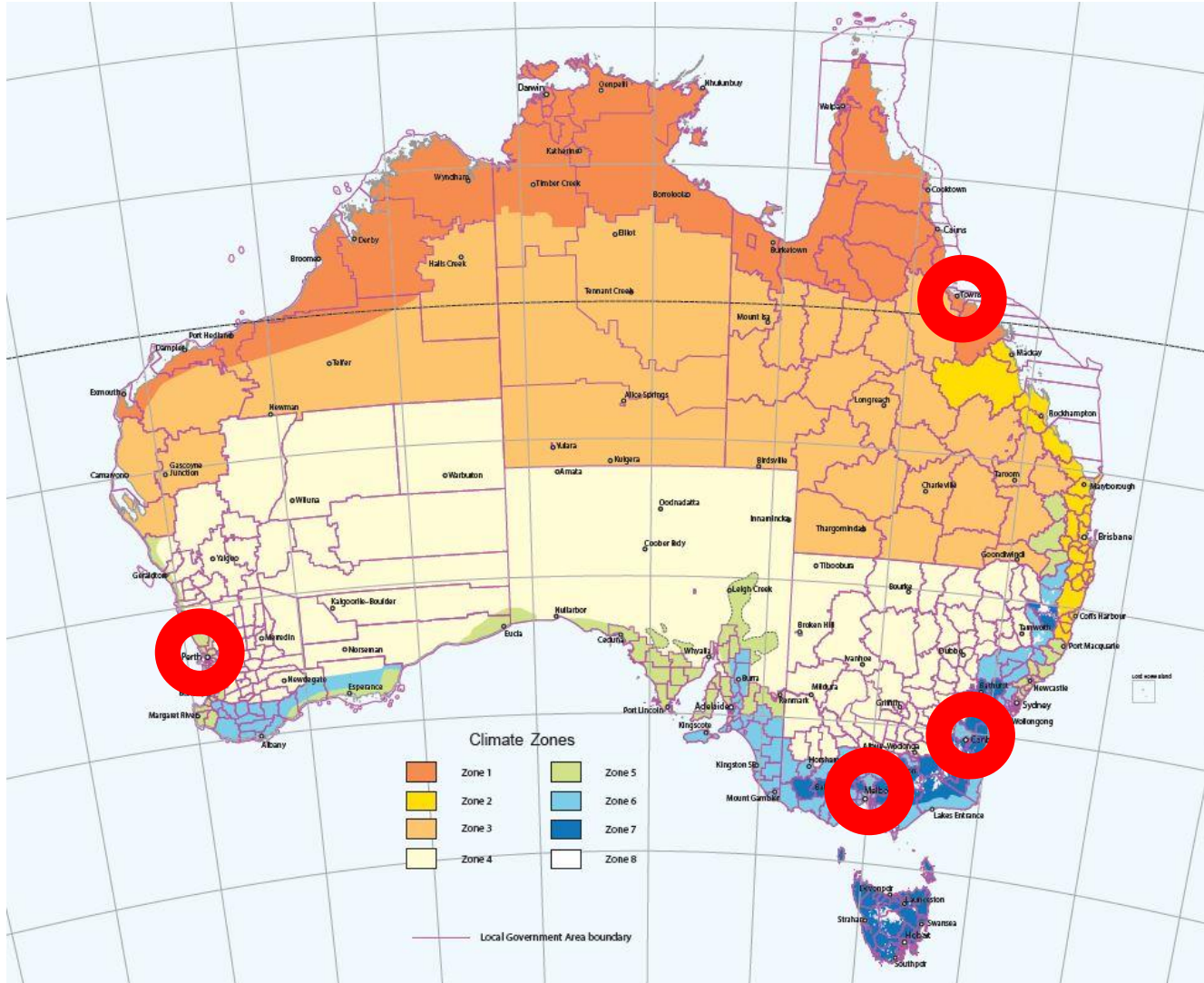


Design Credit: Harris Architects / Yolk Property Group

Performance Monitoring & End-user Feedback

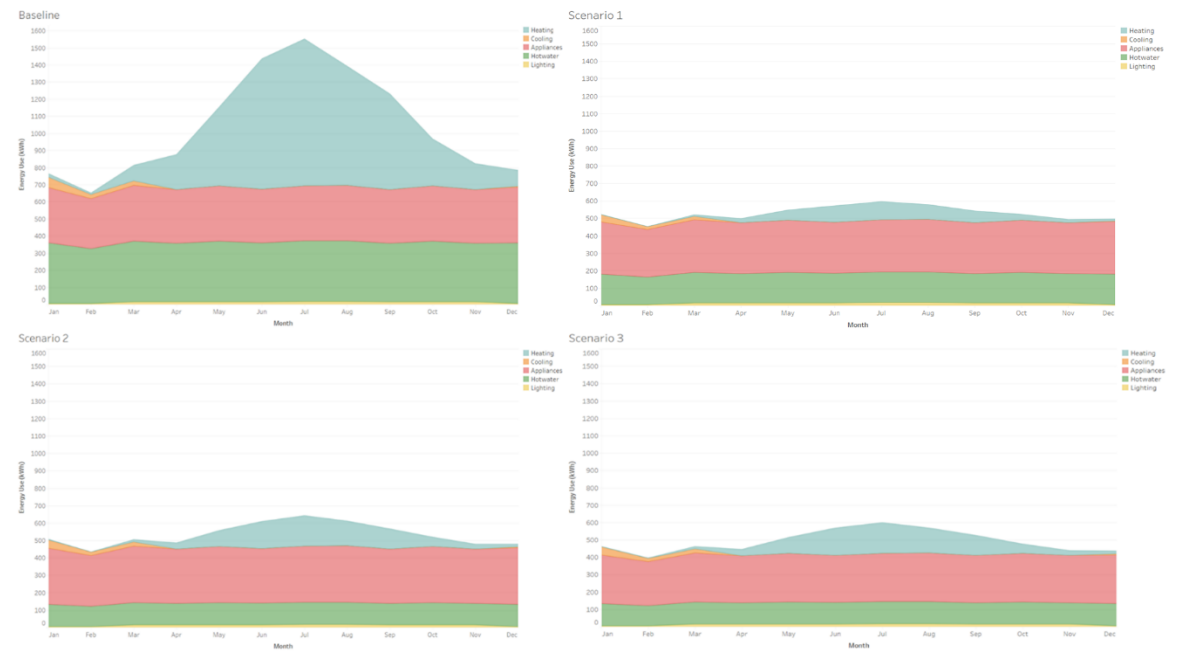


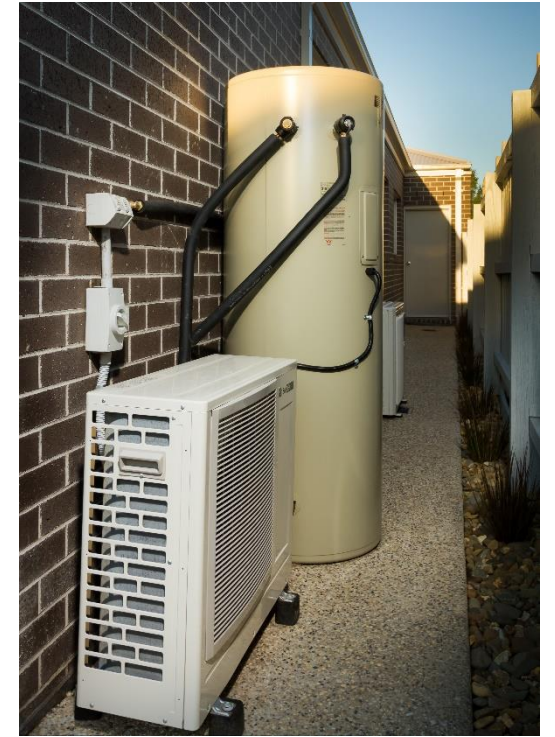
MAINSTREAMING ZERO ENERGY HOUSING



Stockland & Finlay Homes
Mirvac & Terrace (BGC)
Riverview Group & Rawson Homes
Parklea & SJD Homes

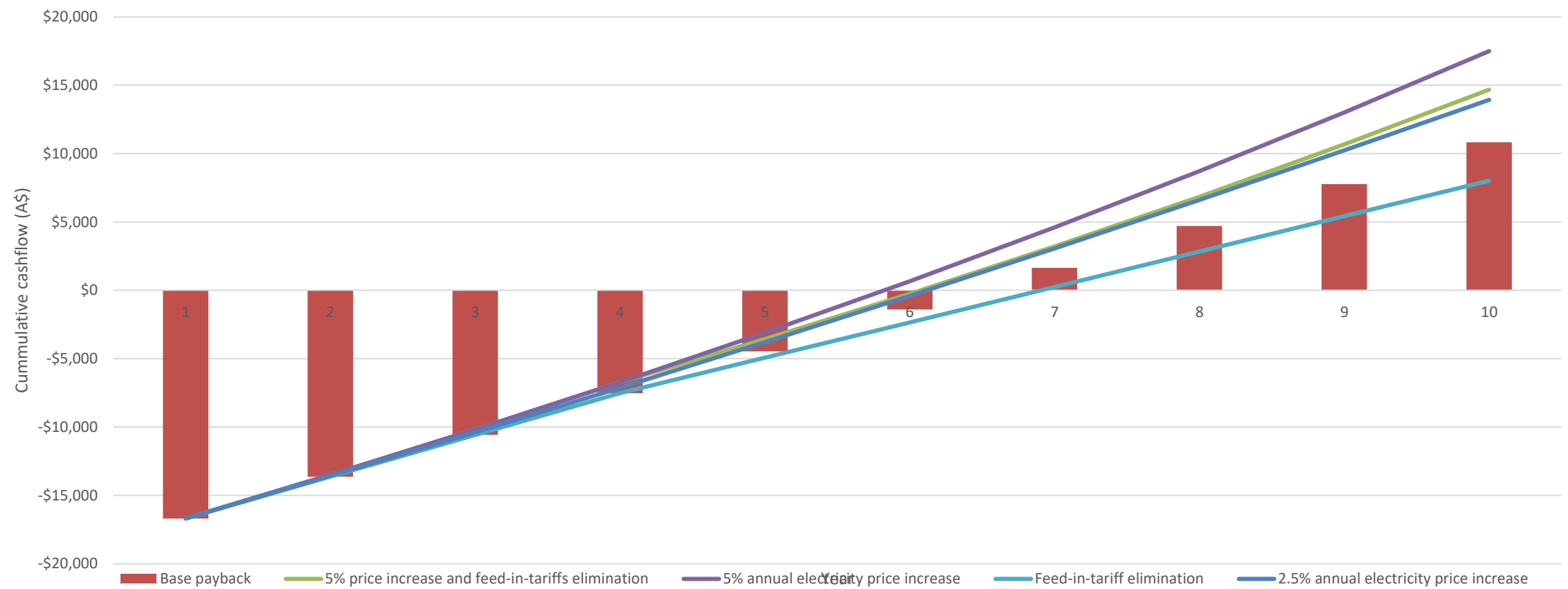
Collaborative Design Review





Credit: SJD Homes

Cost Analysis



Display Phase



Credit: SJD Homes

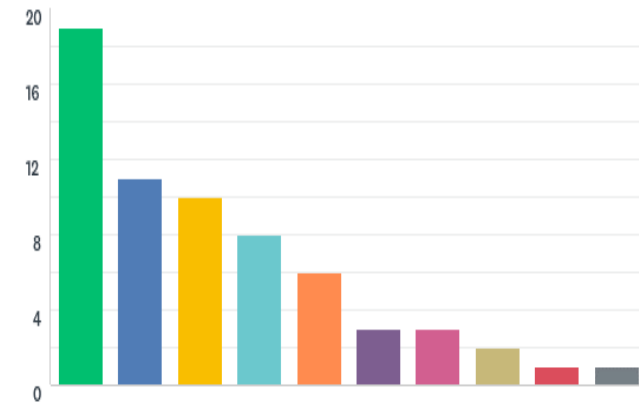


Credit: Sustainability Victoria

Market Surveys



Credit: SJD Homes





w: joshshouse.com.au



w: densitybydesign.com.au



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