Exemplary Advances

Exemplary Weather and Energy (EWE) Index[i] - December 2015

Monthly tabulation and commentary relative to the climatic norm – the Reference Meteorological Years

2015 December	Canberra		Perth		Sydney	
	Heat	**Cool**	**Heat**	**Cool**	**Heat**	**Cool**
10-Storey	-	13%	-	-19%	-	-23%
3-Storey	-	15%	-	-15%	-	-17%
Supermarket	-99%	29%	-	-20%	-	-21%
Solar PV	7.6%		4.0%		0.2%	

3-Storey Office
Monthly Heating and Cooling Consumption

Canberra was warmer and sunnier than the average in December. The mean minimum temperature was 2.9°C higher than average and the average and maximum temperature were 1.2°C and 0.2°C higher respectively. As a result, there were noticeable increases for cooling energy consumption from all three types of commercial buildings, varying from 13% to 29%. The 99% decrease in the heating consumption for the supermarket was due to the extremely small value. The sunny weather also made an increase in the PV production: there was a 7.6% increase over the long term average. Additionally, Canberra was drier than average by a margin of 20.4% in relative humidity.
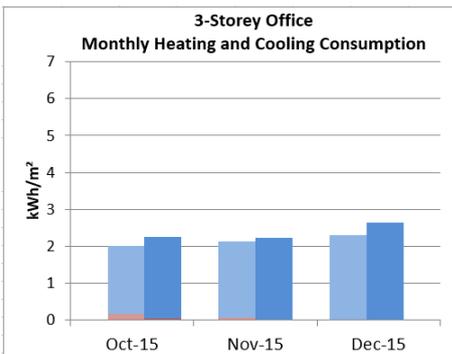
Perth had a cooler than average December, with the mean maximum 3.1°C lower and the average 1.7°C lower than the reference year values. However, the mean minimum was higher than the reference minimum by 0.2°C. The cooling consumptions of all our commercial building models were 15-20% lower than the December averages. The PV model had an energy yield 4% higher than the reference values. The cooling consumptions of the 10-storey office North, South and West perimeter zones were around 25% lower due to the lower average temperatures. The East facing zones also had cooling consumptions at 20.4% lower than the reference value due to the sunnier mornings.

Sydney has been warmer than average for 7 months (since May) until last month, the weather was cooler. The mean minimum was higher by 0.6°C but the mean maximum and average temperatures were lower by 1.7°C and 0.5°C respectively. The cooling consumptions of our commercial building models were 17-23% lower than the December averages. The cooling consumptions of the 10-storey office North and West perimeter zones were 29.5% and 20.8% lower respectively due to the cooler and cloudier weather. The East and South perimeter zones were also lower by over 30% due to the cooler air temperature. The PV model had an energy yield of 0.2% higher

Supermarket
Monthly Heating and Cooling Consumption

than the November average. Although it was cloudier, the lower air temperature and higher wind speed is beneficial to the panel efficiency.
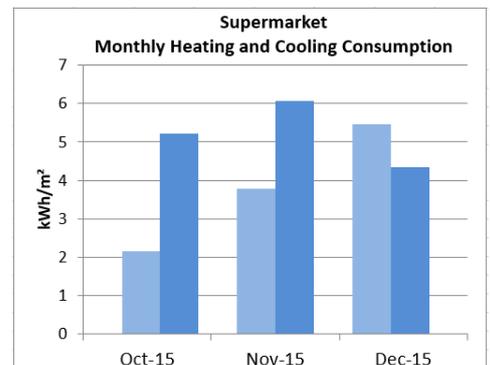
Mandatory Home Energy Rating in the ACT for 201 Months

Mandatory [rating](#) and disclosure of the energy efficiency of existing homes at the time of sale has been [law](#) in the ACT since April 1999 and we have tracked the $/star value correlation since then.

New Engineering Intern from ANU

Yoke Fung is in his final year of a Bachelor of Engineering degree at the Australian National University, majoring in Mechanical and Material Systems. While studying at [ANU](#), Yoke familiarised himself with a range of different softwares such as Solidworks and ANSYS for mechanical engineering; Matlab and Python for computer programming; IBM SPSS and Origin Lab for data analysis.

During his studies, Yoke has worked and collaborated with a number of stakeholders. This includes IT Power Australia where he was the technical team leader to design a solar photovoltaic ballasted mounting system and assessed its feasibility for large scale deployment; Queanbeyan City Council where he prepared a waste audit report covering the waste profile of households around Queanbeyan City. He is currently completing his thesis in an industrial cooperation with Fenghua Advanced Technology Co., one of China's biggest capacitor manufacturers in development of the next generation capacitor.

Yoke started working at Exemplary Energy Partners as an intern in January 2016, and is currently working on the normalisation and analysis of climate data for key sites in NSW. He is enthusiastic about future projects and hopes to learn more practical skills from the company.

Localised Climates within Metropolitan Areas

Even within the 69 Australian climate zones of the Nationwide House Energy Rating Scheme, there are already 2 Adelaides (3 if you count the Hills), 2 Brisbanes, 4 Melbournes, 2 Perths, and 4 Sydneys (5 if you count the Blue Mountains). Does Canberra warrant similar differentiation? The Bureau of Meteorology has a weather station in Tuggeranong, its most southern suburban area, which locals know will often enjoy different weather to that of the official Canberra weather station at the Airport. But does it enjoy a different climate? The CSIRO also has a high quality weather station at the base of Black Mountain which includes precision solar instrumentation which we use for our Real Time Weather data and EWE Index (see page one) but it has only been running for a little over three years and the relativities between these stations has been the focus of two recent interns: **Joshua de Botton** (Environmental Science, [Macquarie University](#)) and **Maria Salazar** (Engineering and Arts, [ANU](#)). We will report on this work in a future edition of ***"Exemplary Advances"***.

Home Energy Rating OptiMizer – HERO - available for free trial

The service is now available for AccuRate and BERS Pro files with a version to handle FirstRate5 files under advanced development. [Contact us](#) for your free trial.