Exemplary Advances

2015 August **"Exemplary Advances"** is the newsletter for Exemplary Energy Partners, Canberra. Feel free to forward it to friends and colleagues. Click here to subscribe or unsubscribe. Feedback is most welcome.

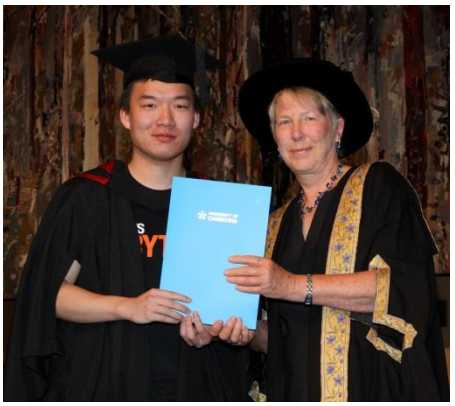
Past editions of **"Exemplary Advances"** are available on our website.

PV_OptiMizer – enhanced and available free

The latest version of our solar PhotoVoltaic (PV) evaluation app is now available for free. See our May edition or the June edition of ACADS-BSG's *"Megnus"* for a list of the enhancements.

The free download holds data for a tropical, an arid and a southern location. In-app purchases allow access to data for 100 locations and for editing the system components, making it a design tool for anywhere in Australia. Use the following links for your own free trial of the Android or iOS version.

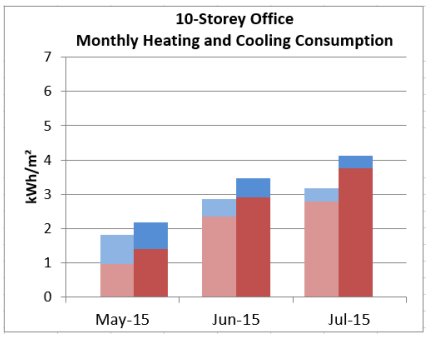
Exemplary Intern – Chris Miao Wang



Miao (Chris) Wang is a final year student at the University of Canberra completing a Master of Information Technology degree. He recently joined Exemplary as an intern and has been trained in using software for weather file analysis for the production of climate and weather data. He will focus on rebuilding Exemplary's website and its SEO (Search Engine Optimization). In the future, he will build up and add more functions (applications) in the website to provide more convenience and assistance to our clients. If you have any suggestions or requests, please let us know.

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

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

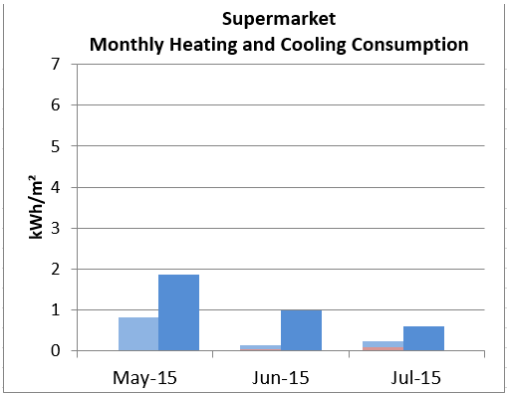


2015 July	Canberra		Perth		Sydney	
	Heat	Cool	Heat	Cool	Heat	Cool
10-Storey	35%	-4%	-16%	5%	-67%	20%
3-Storey	44%	-7%	-16%	7%	-64%	28%
Supermarket	27%	-	-23%	84%	-98%	315%
Solar PV	-5.6%		-6.3%		-1.0%	

Canberra was slightly cooler than average. The mean maximum is lower by 1.5°C while the mean minimum and average temperatures are each lower by less than 1.0°C. It was also cloudier. The PV model gave an energy yield of 5.6% lower than the July average despite the higher efficiency at lower temperatures.–All our commercial building models had heating consumptions higher than the July average due to colder and cloudier weather. The 10-storey office heating consumptions in the West and North facing perimeter zones, where the solar and temperature effects are most keenly felt, are about 37% and 46% higher respectively.

Perth had a slightly warmer and cloudier than average July. The PV model had an energy yield of 6.3% lower. The mean maximum and average are higher by 1.7°C and 1.2°C respectively. The heating consumptions in our two office models are both 16% lower. The 10-storey office heating consumptions in the West and North facing zones are about 18% and 4% lower, respectively, despite the reduced solar gain. The heating energy consumption of the supermarket model was 23% lower and cooling almost 85% higher, however the actual and average cooling values are all small.

Sydney has been warmer than average since May and the warm weather has continued through July. Although the mean maximum is only 0.6°C higher than the average, the mean minimum and average are higher by 4.6°C and 3.3°C respectively. It was slightly cloudier as well. The PV model had an energy yield of 1% lower than the long term average. Both our office buildings had a modelled cooling consumption higher and heating lower than the average. The cooling consumptions in the 10-storey office West and North facing perimeter zones are both over 50% higher and with heating lower by around 60%. The supermarket model had a cooling consumption over 4 times greater than the average due to its longer business hours (relative to the offices) and the substantially higher than average air temperature after sunset and in the early morning. Similarly, the heating demand was almost eliminated.



Energy Modelling in the Real World

On 14 July Exemplary Director, **Trevor Lee,** presented on the building optimisation uses of Real Time Year (RTY) weather data at the International Building Performance Simulation Association (IBPSA) seminar in Sydney called *Energy Modelling in the Real World*. Following presentations by Dr Paul Bannister from Energy Action on *"Optimising Supply Air Temperature Control"* and Quentin Jackson from Aurecon on *"Early Stage Simulation – Friend or Foe?"*, Trevor presented on *"Weather Affects Building Performance - Simulation vs Monitoring"* to a keen gathering of around 50 engineers and simulators.

Real Time Year (RTY) data sets to the end of July 2015 are now available for CBR, PER and SYD. Click here for details. Superseded RTYs are available at a discount of 10% per month past publication date, with up to a 50% total discount available (20% per month past publication date for student, academic and other non-commercial use). So please enquire about formats and delivery times.

Solar Radiation Data for >100 Locations – publication

Wherever ground-measured solar radiation data is available, we use it. But for most places in Australia this data is estimated by the Bureau of Meteorology from off-the-hour satellite observations. Accordingly, enhancing the precision of the Bureau's techniques is of some importance. Exemplary director, **Trevor Lee,** and engineering intern, **Fangwei Ding,** have been working in that direction with CSIRO's **Robert Davy** and presented the results at the International Conference on Energy and Meteorology in Boulder, Colorado, in June. The presentation of those results, showing massive individual-hour differences underestimating and overestimating the solar radiation and its significance for reliable simulation use, is now published on the ICEM website: *"Comparison of Satellite Estimated Hourly Solar Data with Coincident Ground Based Measurements and their Applications in Industry and Commerce"*.

[i] Exemplary publishes the EWE for three archetypical buildings and a residential solar PV system each month; applying the RTYs to EnergyPlus models developed using DesignBuilder for a 10-storey office, a 3-storey office and a single level supermarket as well as an SAM model of a typical 3 kW_{peak} solar PV system designed by GSES. All values are % increase/decrease of energy demand/output relative to climatically typical weather. Especially during the mild seasons, large % changes can occur from small absolute differences.