Exemplary Advances

2016 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.

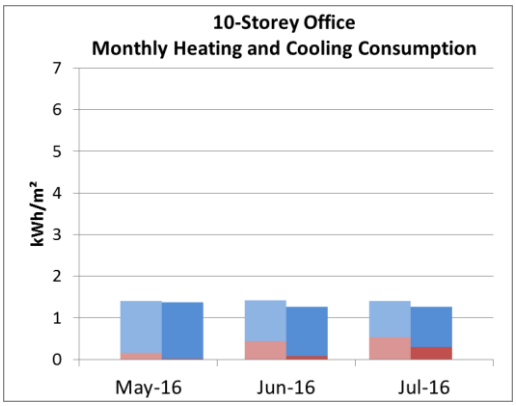
Exemplary Weather and Energy (EWE) Index[i] - July 2016

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

2016 July	Canberra		Perth		Sydney	
	Heat	Cool	Heat	Cool	Heat	Cool
10-Storey	-3%	-7%	65%	-17%	-43%	9%
3-Storey	-2%	-5%	59%	-14%	-38%	12%
Supermarket	-14%	0%	123%	-90%	-51%	385%
Solar PV	-11.1%		-23.1%		-6.7%	

Canberra had warmer and cloudier than average weather in July. The PV panel had an energy yield of 11.1% lower in this weather. The mean maximum, minimum and average temperature were higher by 4.1°C. 1.7°C and 1.2°C respectively. The overall heating consumptions of our 3 commercial building models were lower than the average as a result. The 10-storey office South and West facing zones had heating around 2% - 3% lower due to the warmer air temperature. However, the heating of the 10-storey office North and East perimeter zones were around 8% higher due to the cloudier weather. The cooling consumptions were also lower in our 2 office models but the actual values were negligible.

Perth also had warmer than average weather in July. The mean maximum and average temperature were higher by 2.4°C and 0.3°C respectively. Only the mean minimum was lower by 0.2°C. However, the warmer weather occurred mostly at night time (outside of the office working / supermarket trading hours). During the morning (7am to 11am) the average air temperature was slightly lower than the average weather. Also, it was cloudier and windier than the average. All our commercial building models incurred greater heating consumption under this weather. The 10-storey office North and East facing zones had more than doubled the normal heating consumption. The PV panel had an energy yield of 23.1% lower than the climatic average.



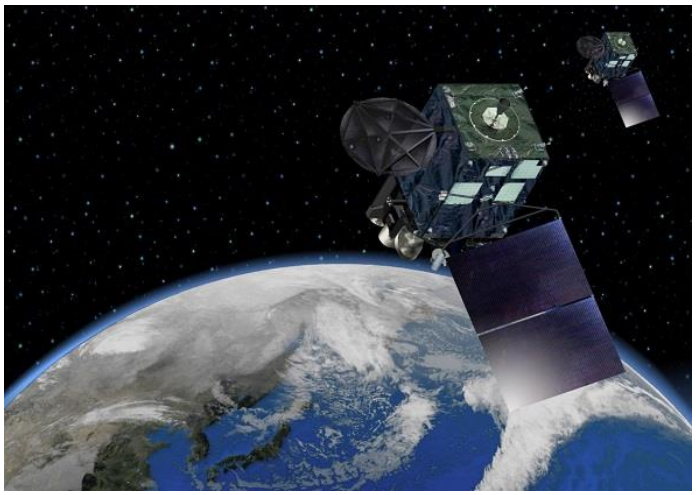
Sydney has been warmer than average since May and the warm weather has continued through July. The mean maximum, minimum and average temperature were higher by 1.0°C, 1.3°C and 1.0°C respectively. As a result, the heating consumptions of our 3 commercial building models were lower than the average. The South and West perimeter zones of the 10-storey office had over 40% lower heating consumption because the warmest time of the day was mostly during the late afternoon. The cooling consumption of the supermarket was almost 400% higher than the average but the actual value was small. It was also cloudier than the average, therefore the PV panel energy yield was 6.7% lower than the climatic norm.

Mandatory Home Energy Rating in the ACT for 209 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. Recently, we have disaggregated the data by housing type and will be publishing those results soon.

Bureau of Meteorology switches to Himawari for Solar Data

Himawari is the Japanese word for sunflower. Himawari-8 and -9 are new geostationary weather satellites operated by the Japan Meteorological Agency (JMA). They are successors to JMA's Multi-functional Transport Satellite (MTSAT) series, offering significant improvements in frequency, resolution and precision.



The Advanced Himawari Imager (AHI) instrument carried by both Himawari-8 and -9 records more data than previous geostationary meteorological satellites—16 channels, including three visible wavelength bands (red, green and blue) to create 'true-colour' images of the Earth. Different channels give us greater insights into different characteristics of the atmosphere.

Imagery from the AHI instruments also has finer spatial resolution (0.5–2 km, compared to 1–4 km for MTSAT) and precision (12–14-bit images, vs 10-bit for MTSAT). It also has higher temporal resolution; that is, new images are recorded more frequently, with one 'full disk' scan of the observable area every ten minutes (compared to hourly from MTSAT).

Unlike the MTSAT orbital configuration (with MTSAT-1R at 140°E, MTSAT-2 at 145°E), Himawari-8 and Himawari-9 orbit in close formation, both at around 140.7°E (in line with Japan, Irian Jaya and central Australia). This will offer the same view perspective when operations are switched between the satellites. With only a few days of overlap to allow calibration and testing, the switchover from MTSAT to Himawari occurred in mid-March this year.

So, when the Bureau publishes its next tranche of gridded solar data (slated for September, retaining the hourly frequency) we will need to amend our interpretive code to suit its higher spatial resolution and changed perspective (longitude) and scan times.

For more detail, click here.

Humidity Issues in Australian Climates – AIRAH Workshop

In Sydney on 3 August, AIRAH convened a one-day workshop on Humidity Issues in Australian Climates. Making a preliminary report for peer review of methodology for a project for the Insulation Council of Australia and New Zealand (ICANZ), Director (Buildings) **Trevor Lee** prepared a presentation with joint project participants Dr Mark Dewsbury (Architecture, University of Tasmania) and Dr Peter Lyons (Director, Fenestralia) entitled *"Condensation risks in bulk insulation in hot and mixed climates"*. That presentation can be viewed as a PDF here.

[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.