Exemplary Advances

2019 September ***"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.

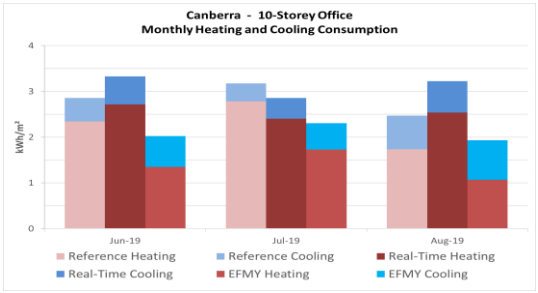
Past editions of ***"Exemplary Advances"*** are available on our website.

Exemplary Weather and Energy (EWE) Index[i] - August 2019

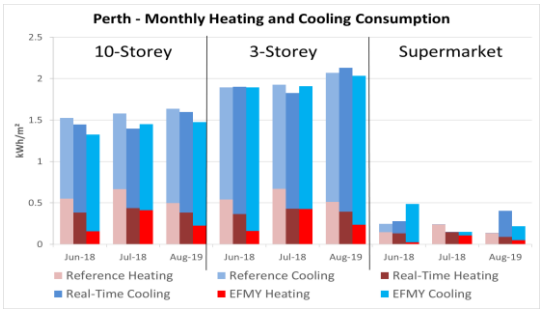
Monthly tabulation and commentary relative to the climatic norm – the Reference Meteorological Years

2019 August	Canberra		Perth		Sydney	
	Heat	Cool	Heat	Cool	Heat	Cool
10-Storey	46%	-7%	-23%	6%	-	-
3-Storey	46%	-9%	-23%	12%	-	-
Supermarket	44%	N.A.	-35%	N.A.	-	-
Solar PV	12.8%		0.4%		-1.9%	

The Exemplary Real Time Year weather files (RTYs) used for these monthly simulations are available for purchase to allow clients to simulate their own designs for energy budgeting and monitoring rather than rely on analogy with the performance of these archetypical buildings and systems.



Canberra had a cooler than average weather in August in terms of mean average air temperature. The mean maximum, minimum and average temperature were lower by 3.2°C, 0.3°C and 1.6°C respectively. Heating consumptions of all the three commercial buildings were higher than the averages. It was sunnier as well, therefore, the solar PV array had an energy yield of 12.8% higher. The 10-Storey office South facing zone had over 41% higher heating consumption than the norm due to the cooler air temperature. It was overall sunnier, but data shows that on average morning had less sun than the norm, therefore, the 10-Storey office East facing zone had close to 90% higher heating consumption due to the cloudier and cooler morning.



Perth had warmer than average weather in August. The mean maximum, minimum and average temperatures were higher by 2.0°C, 0.4°C and 1.2°C respectively. All three commercial building models had heating consumptions lower than the averages. The 10-Storey office West facing zone had over 25% lower heating consumption than the norm. South facing zones also had heating consumption close to 25% lower due primarily to the warmer air temperature. It was slightly sunnier, therefore, the solar PV array had an energy yield of 0.4% higher in this weather.

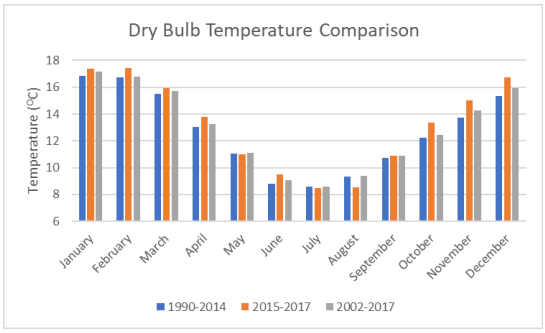
Sydney – No data was available for Sydney for the month of August.

Temporal Analysis of Weather Data – Hobart

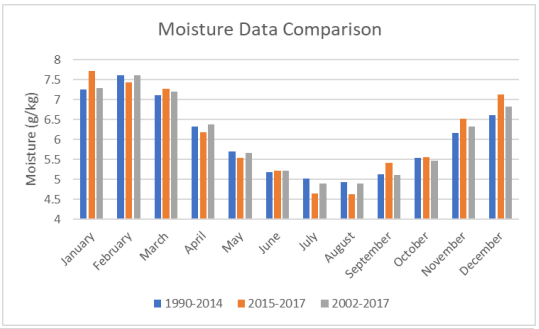
Exemplary has prepared updates to its set of 201 Australian sites most recently published for the quarter century of 1990-2014. Especially in the context of a changing climate, we are routinely processing data from subsequent years and comparing this with the prior decades. Most recently, this has been done for

the three years 2015-2017 and the change analysed through the increments over time of the five key weather elements. For completeness, we have also compared the potential new climate data season of 2002-2017 (the most recent available 15-year data sets – long enough to smooth out the perturbations of the ~11-year Sunspot Cycle).

The Temporal Analysis has been carried out for the eight capital cities plus Alice Springs NT (Arid) and Cabramurra NSW (Alpine) so as to cover the gamut of the Climate Zones in the Building Code of Australia (BCA) - now part of the National Construction Code (NCC). This issue of Exemplary Advances brings to you the Temporal Analysis for the city of Hobart.

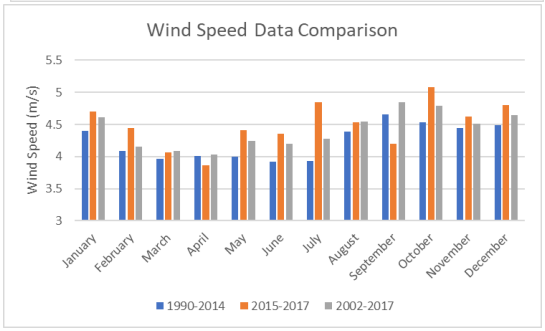


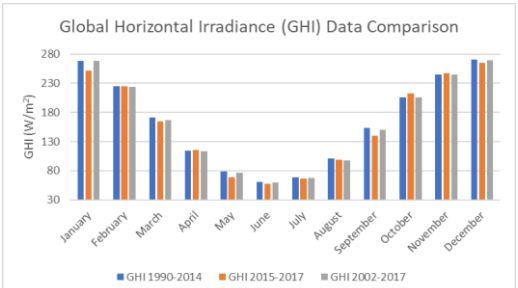
The new batch of processed data did not result in as many changes as other cities on which the comparison was made. P10 data had 8 changes while P90 data had only 5 changes. February for P90 was the only month in the whole dataset to have a change to a recent year from the 2015-2017 period, the change being from 2014 to 2016.

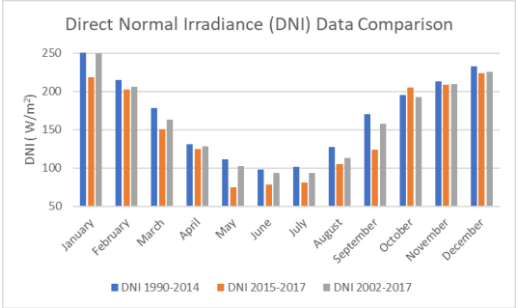


RMY-A months had only a single change in March, from 2004 to 2007. While RMY-B and RMY-C data each had 3 changes, all for the months of June, July and October. Comparing the averages of the weather parameters for the old months and the new months, there was an increase to all values. Mean dry bulb temperature increased by 0.55 degrees, moisture content by 7.96%, wind speeds by 20.27%, GHI by 0.9% and DNI by 6.31%.

Comparing 1990-2014 data with that of 2015-2017 showed an increase in mean temperature of 0.51 degrees, an increase to moisture of 0.90% and an increase to wind speed of 6.17%. GHI and DNI witnessed a decrease by 2.68% and 11.26% respectively.







Upon Comparison of 1990-2014 months with months of 2002-2017, the mean temperature showed a rise of 0.23°C, moisture content increased by 0.43% and the wind speeds rose by 4.23%. GHI and DNI, however, declined by 0.99% and 4.45% respectively.

Further to this temporal analysis of weather data for **Hobart** between the widely-used current set of data (1990-2014) with the recently developed new batch of weather data (1990-2017), each issue of ***"Exemplary Advances"*** will see a similar comparison for each of the other nine sites around our country to assist readers to consider the need to update the weather and climate data they use for their simulations and other analyses. Look out for them in past and future editions of ***"Exemplary Advances"***.

[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. RTYs are available for purchase for your own simulations.