Exemplary Advances

2020 June ***"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.

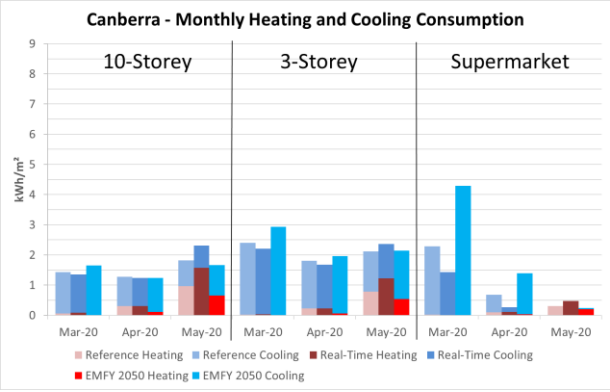
Exemplary Weather and Energy (EWE) Index[i] - May 2020

Monthly tabulation and commentary relative to the climatic norm – the Reference Meteorological Years
Caution: modest differences in the mid-seasons can produce large % relativities due to the small base values.

2020 May	Canberra		Perth		Sydney	
	Heat	Cool	Heat	Cool	Heat	Cool
10-Storey	64%	-15.2%	9.7%	-2.1%	-30.1%	-0.8%
3-Storey	57%	-14.8%	3.0%	0.2%	-23.3%	-2.8%
Supermarket	58%	N.A.	14.3%	65.5%	-82.0%	-57.0%
Solar PV	4.6%		-0.3%		-0.7%	

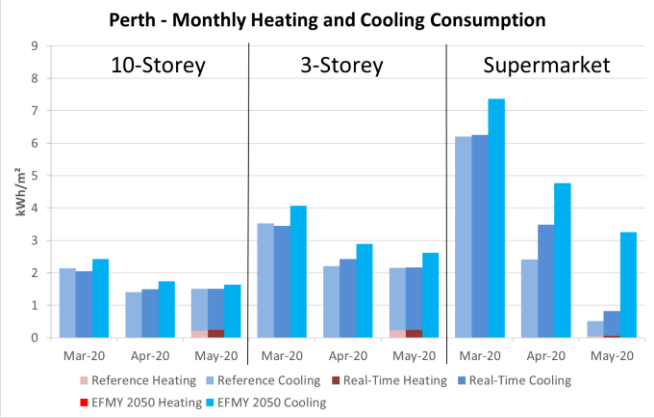
The Exemplary Real Time Year weather files (RTYs), the current Reference Meteorological Year files (RMYs) and the Ersatz Future Meteorological Years (EFMYs) used for these monthly simulations are available for purchase to allow clients to simulate their own designs for energy budgeting and monitoring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

Canberra had a cooler than average May. The mean average, mean maximum and mean minimum temperatures were lower than the averages by 1.2°C, 1.5°C and 0.5°C. All three commercial building models had higher than average heating consumptions. It was overall cloudier in terms of the amount of solar radiation, however, the cold weather was beneficial to the solar PV system efficiency and therefore, the solar PV array had an energy yield of 4.6% higher than the average. The heating energy consumption of the 10-storey office East facing zones were 104.9% higher than the averages due to the generally colder mornings. North and West facing zones consumed relatively less but also significantly higher in terms of percentage of heating energy than the average by around 43% to 67%. The temperature at the hour when heating consumption was at its peak was -2.1°C, which was 5.9°C lower than the average. The peak heating consumption of the 10-storey office model therefore was 49.6% higher than the average. When comparing the simulation results using our EFMY 2050 climate data with the RTY, it is projected that the two office building models would both have over 28% higher heating consumption than the RTY, and the supermarket would require heating consumption in May (currently no cooling in the supermarket).

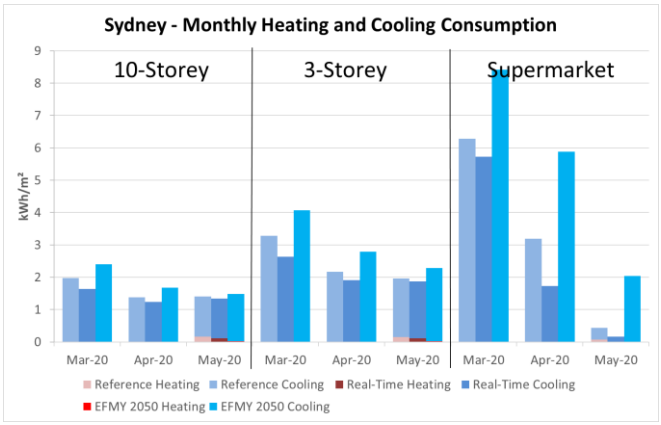


Perth had a cooler than average May during the night but warmer during the day. The mean average and mean maximum temperatures were higher than the averages by 0.1°C and 0.9°C respectively, and the mean minimum temperature was lower than the average by 0.47°C. The 10-storey office had a lower than average cooling consumption due to the cooler morning. The 3-storey office had slightly higher than average cooling energy consumption but only by 0.2%. The supermarket had comparatively

higher than average cooling consumption than the 2 office models due to the cooler evening, night and early in the morning (the time when the supermarket operates while the offices are still closed). The solar PV array had an energy yield of 0.3% lower due to the warmer weather during the day and lower than average wind speeds which reduced the modules' efficiency. The 10-storey office North and East facing zones all had higher than average heating energy and cooling energy consumption due to the cooler mornings but warmer afternoons. The air temperature was at 26.7°C at the hour of peak cooling, which was 1.2°C higher than the average. Also, the global horizontal radiation was 24.9% higher than the average. Therefore, the peak cooling consumption of the 10-storey office model was 14.0% higher than the average due to the warmer and sunnier weather during the hour of peak load. When comparing the simulation results using our EFMY 2050 climate data with the current climate, it is projected that the two office building models would have 23%-27% higher cooling consumption and the supermarket would have 76% higher cooling consumption than for the May just gone.



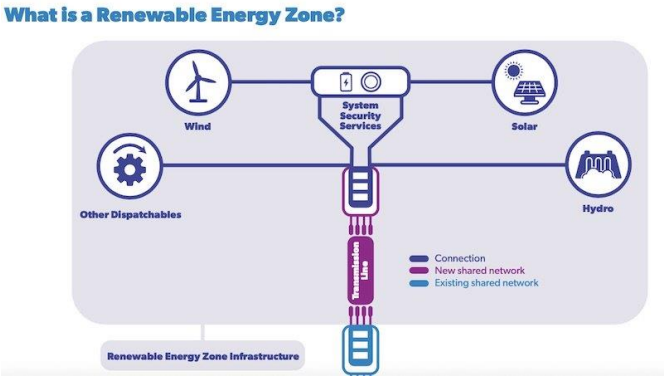
Sydney had a slightly warmer than average May. The mean average and mean minimum temperatures were 0.6°C and 0.7°C higher than the averages. Only the mean maximum temperature was 0.7°C lower. Both the heating and cooling consumption of all the commercial building models were lower than the averages and the lower Relative Humidity (RH%) was also a contributing factor (16.2 percentage points lower). The 10-storey office North, East, South and West facing zones all had cooling consumptions lower than the averages by around 5%-14%. It was overall cloudier; therefore the solar PV array had an energy yield of 0.7% lower. The temperature at the hour of peak cooling was 23.4°C which was 1.6°C lower than the average. Also, the global horizontal radiation was 21.8% less than the average. Hence the peak cooling consumption of the 10-storey office model was 12.9% lower than the average due to the cooler and cloudier weather at the hour of peak. When comparing our EFMY 2050 simulation results with the results for the May just gone, it is projected that the two office models would have around 16%-22% higher cooling consumption and the supermarket would have 90% higher cooling consumption than the May of the RTY.



NSW first renewable zone attracts stunning 27 GW

Sophie Vorrath 23 June 2020

The New South Wales government's plan to establish its first renewable energy zone in the state's Central West has received a "phenomenal" response, attracting 113 registrations of interest for projects totalling a massive 27 gigawatts and valued at $38 billion.



The stunning response was revealed on Tuesday, less than one month after the state Coalition government put out the call for 3,000 MW or more of potential wind, solar and storage project proposals looking to join the state's – and Australia's – first Renewable Energy Zone (REZ).

"With our local communities doing it tough from drought and now the Covid-19 pandemic, this phenomenal response shows the massive opportunity REZs can create with jobs, investment and new revenue streams for regional NSW," said NSW deputy premier **John Barilaro**.

"The Central-West Orana REZ is expected to generate $4.4 billion in investment, create 450 construction jobs, help put downward pressure on electricity prices and allow landowners to diversify their incomes by hosting renewable energy infrastructure.

For more information visit Renew Economy.

Delays to Solar Radiation Data for 2019

Regular readers might recall that Dr Ian Grant, the scientist at the Bureau of Meteorology (BoM) who processed the satellite data into estimated gridded solar irradiation data, died late last year (see "*Exemplary Advances"* 2019 December). Sadly the BoM has yet to restore that service to the renewable energy and building simulation community. The Australian PhotoVoltaic Institute (APVI) is working with other interested groups and the BoM to restore that service as soon as possible. We hope to provide an update on their progress in the next edition as there has been no progress over the past month.

Australia has Failed Miserably on Energy Efficiency

Australia has failed miserably on energy efficiency; and government figures hide the truth according to the ANU's Dr Hugh Saddler.

Amid the urgent need to slow climate change by cutting greenhouse gas emissions, energy efficiency makes sense. But as Australia's chief scientist **Alan Finkel** last week warned, we're not "anywhere close to having that nailed".

Energy efficiency means using less energy to achieve the same outcomes. It's the cheapest way to cut greenhouse gas emissions and achieve our climate goals. Improving energy efficiency is also vital to achieving so-called "energy productivity" – getting more economic output, using the same or less energy.

But Australia's national energy productivity plan, agreed by the nation's energy ministers in 2015, has gone nowhere.

It set a goal of a 40% improvement in energy productivity by 2030. But my analysis, based on the most recent official data, shows that in the three years to 2017-18, energy productivity increased by a mere 1.1%.

For more information visit The Conversation.

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[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.