Exemplary Advances

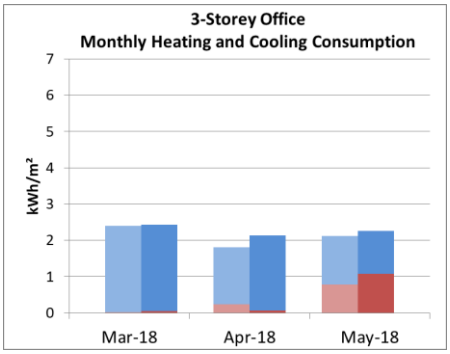
2018 June ***"Exemplary Advances"*** is the newsletter for Exemplary Energy Partners, Canberra. Feel free to forward it to friends and colleagues. Click here to subscribe or unsubscribe. Feedback is most welcome.

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

Exemplary Weather and Energy (EWE) Index[i] - May 2018

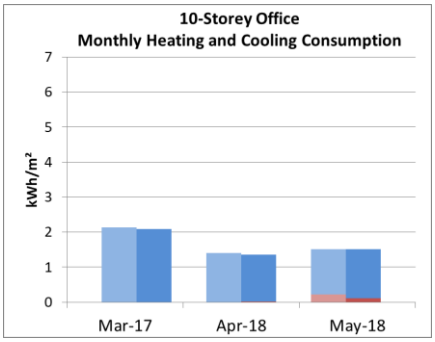
Monthly tabulation and commentary relative to the climatic norm – the Reference Meteorological Years

2018 May	Canberra		Perth		Sydney	
	Heat	Cool	Heat	Cool	Heat	Cool
10-Storey	43%	-10%	-46%	7%	-52%	1%
3-Storey	39%	-11%	-50%	13%	-45%	4%
Supermarket	35%	N.A.	-46%	186%	-82%	33%
Solar PV	8.5%		3.2%		0.7%	

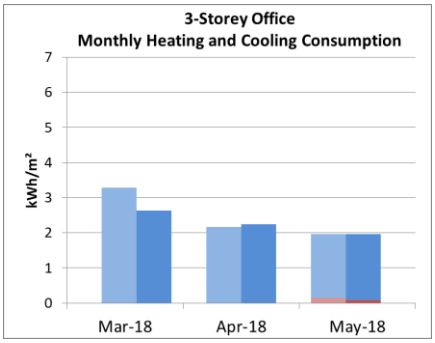


Canberra had cooler than average weather in May. Although the mean maximum was higher by 1.4°C, mean minimum and average temperatures were lower by 2.4°C and 0.5°C respectively. All the commercial building models had heating consumptions higher than the averages. The 10-storey office East facing zone had nearly 90% more heating than the norm due to the lower air temperatures during the night and early morning. North facing zone also had around 53% more heating consumption. It was sunnier as well, the solar PV array energy yield was 8.5% higher in this weather.

Perth had warmer than average weather in May. The mean maximum, minimum and average were higher by 2.4°C, 4.3°C and 1.6°C respectively. All the commercial building models had heating consumptions lower than the averages and higher in cooling. It was sunnier as well.



The 10-storey office North and West facing zone had heating consumption less than the averages by 32% and 44% respectively due to the warmer air temperatures and sunnier weather. The PV panel energy yield was higher by 3.2%.



Sydney also had warmer than average weather in May. The mean maximum, minimum and average temperatures were higher by 0.3°C, 1.6°C and 1.3°C respectively. It was slightly sunnier hence the solar PV energy yield was 0.7% higher.

The heating consumption of the 10-storey office South facing zone was 50% lower than the norm due primarily to the higher air temperatures. The West facing zone also had heating consumption over 50% lower due to the warmer air temperature in the afternoon.

Feasibility of 100% renewable electricity systems: response to critics

By Mark Diesendorf and Ben Elliston, UNSW

The rapid growth of renewable energy (RE) is disrupting and transforming the global energy system, especially the electricity industry. As a result, supporters of the politically powerful incumbent industries and others are critiquing the feasibility of large-scale electricity generating systems based predominantly on RE through the publication of myths about renewable electricity (RElec) in scholarly journals, popular articles, media, websites, blogs and statements by politicians. We use current scientific and engineering theory and practice to refute the principal myths by showing that large-scale electricity systems that are 100% renewable (100RElec), including those whose renewable sources are predominantly variable (e.g. wind and solar PV), can be readily designed to meet the key requirements of reliability, security and affordability.

Also, the transition to 100RElec could occur much more rapidly than suggested by historical energy transitions because the principal barriers to 100RElec are neither technological nor economic, but instead are primarily political, institutional and cultural in nature.

For the full paper, visit Renewable and Sustainable Energy Reviews.

Mandatory Home Energy Rating in the ACT for 230 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.

Heating and cooling costs of high and low performing homes

Exemplary Energy Partners has updated its published cost/performance tables allowing householders to estimate the financial effect of improving the energy efficiency of the home and/or the heater/cooler appliances.

		Home Energy Rating Stars (EER)								
	Stars	1	2	3	4	5	6	7	8	9
Gas Furnace and Air Conditioner Energy Rating Stars	1	$3,689	$2,292	$1,622	$1,189	$900	$686	$500	$320	$148
	2	$2,957	$2,042	$1,445	$1,059	$802	$611	$445	$285	$132
	3	$2,606	$1,800	$1,273	$934	$707	$539	$393	$251	$116
	4	$2,264	$1,564	$1,106	$811	$614	$468	$341	$218	$101
	5	$1,928	$1,332	$942	$691	$523	$399	$290	$186	$86
	6	$1,598	$1,104	$781	$573	$434	$330	$241	$154	$71

The new electricity price (GST inclusive) that applies from 1 July 2018 has increased by 15.1% (increased by 19.0% last financial year) from 21.758 cents/kWh to 25.036 cents/kWh. The price of gas has fallen by an average of 3.4% from 3.2105 cents/MJ to 3.1017 cents/MJ.

Canberra is located in a heating dominated climate where the amount of energy used for heating is 70%-80% of the total energy consumed, and, gas is the most common fuel for heating at home. The reduce in gas price will lower the annual energy cost, however, the unit price of electricity is significant when compared with gas, the overall annual energy cost has raised as a result.

The resulting cost/performance tables are based on electricity and natural gas prices current for Canberra from 1 July 2018 as published by Evoenergy (formerly ActewAGL). Readers interested in other climates and/or other residential tariffs should contact us with their requests and suggestions.

[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.