# Exemplary Advances

2020 March ***"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] - February 2020

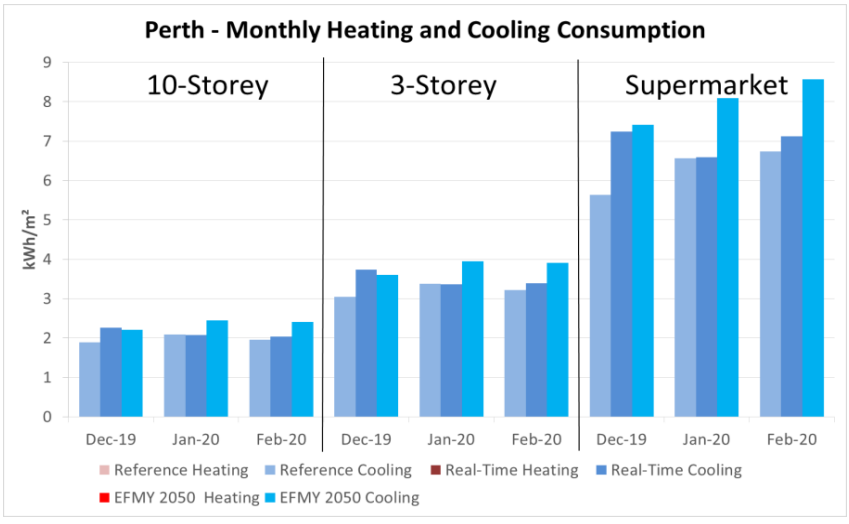
Monthly tabulation and commentary relative to the climatic norm – the Reference Meteorological Years

| 2020 February | Canberra | | Perth | | Sydney | |
|---|---|---|---|---|---|---|
| | Heat | Cool | Heat | Cool | Heat | Cool |
| 10-Storey | - | - | N.A. | 3.9% | N.A. | -15.4% |
| 3-Storey | - | - | N.A. | 5.4% | N.A. | -17.3% |
| Supermarket | - | - | N.A. | 5.8% | N.A. | -4% |
| Solar PV | - | | -7.6% | | 14.5% | |

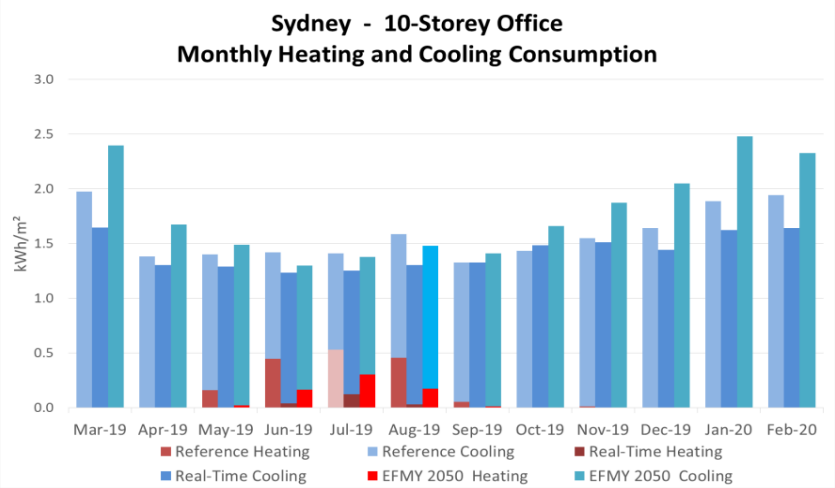
The Exemplary Real Time Year weather files (RTYs), the current Reference Meteorological Year files (RMYs) and the Ersatz Future Meteorological Years (EFMYs) used for these monthly simulations are available for purchase to allow clients to simulate their own designs for energy budgeting and monitoring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

**Canberra** – Data Not Available - but CSIRO's Chris Russell provided this encouraging update:
As of Monday, 30 March, "we are still missing a couple of days in January. We have processed the data for January and February (save for those couple of days). I'm still hoping to recover them, of course. We are actually hoping that it might still be this week. The CoVid19 issue has been a further complication. I'll be finalising the processing of the March data in the next few days. Things seem to be back to normal for newer incoming data."

**Perth** had warmer than average weather in February. The mean average and maximum and minimum temperatures were higher than the averages by 0.8°C, 0.1°C and 0.2°C respectively. All three commercial building models had higher than average cooling consumptions despite the fact that it was cloudier. The 10-storey office East and North facing zones had 2.4-2.8% higher cooling consumption than the norm. Southern zones had 4.2% higher cooling due primarily to the warmer air temperature. The supermarket model used ~5% more cooling energy than in the long-term average February but this is well short of the ~25% increase projected for the climate in 2050[ii]. The solar PV array had an energy yield of 7.6% lower in this warmer and cloudier weather.



**Sydney** had a generally cooler than average February. The mean average was 1.4°C lower. However, the maximum and minimum temperatures were higher by 1.9°C and 0.7°C respectively. The cooling consumption of the two office building models were lower than the averages. The supermarket model had relatively less reduction in cooling consumption when compared with the office models. It is due to its longer operating hours and generally warmer air temperature during the early morning.




The 10-storey office East and North facing zones had over 17% lower cooling consumption. West facing zones had around 14% lower cooling consumption, and, Southern zones had over 22% lower cooling consumption. It was much sunnier, therefore, the solar PV array had an energy yield of 14.5% higher.

## Exemplary teams with DeltaQ and Northrop for DISER Job

DeltaQ, led by engineer **Grace Foo** (pictured), is undertaking a research project entitled *Climate Change – Impact on Building Design and Energy* on behalf of the Department of Industry, Science, Energy and Resources (DISER) to better understand the impact of climate change on commercial building energy consumption and any HVAC and building design changes. Simulation expertise for the project comes from Northrop's **Michael Smith** while the Ersatz Future Meteorological Years (EFMYs) and climate change expertise are being provided by **Trevor Lee** of Exemplary. The results from this research will inform the Department and the Australian Building Codes Board (ABCB), if changes to the 2019 National Construction Code Section J (NCC Section J) or other regulation mechanisms are required to ensure future building resilience.

## Exemplary teams with UNSW to analyse climates over Metro Sydney

UNSW Built Environment has embarked on a research program toward a paper entitled: *"Efficacy of current NatHERS climate files for energy efficient homes in the changing climatic context: A case study of Sydney Metropolitan Area"*. Led by Scientia-Professor-**Deo-Prasad**, researcher Dr **Anir Upadhyay** (pictured) is teaming up with **Chris Lockhart Smith** of EcoDweller and **Trevor Lee** of Exemplary to analyse spatial and temporal aspects of climate within metropolitan Sydney including the application of data for Ersatz Future Meteorological Years (EFMYs). The project will focus on housing and is just getting inaugurated. We will report more in our next edition.

# Vale Jeff Hoy – Doyen of Early Solar PV Industry

Exemplary wishes to honour a former collaborator, Jeff Hoy, principal of **JP Technology**, the creator and distributor of his PV-SPS and PV-GC software to assist the early solar electrical industry to design and install code-compliant systems whether as Standalone Power Systems (SPS) or more recently Grid Connected (GC). Through that software, Jeff disseminated the latest climate and solar data that Exemplary produced. Here a long term colleague and friend of Jeff's, **Trevor Berrill**, tells us more.

*Jeff Hoy contributed significantly to the development of the solar industry through Australia and it is a pleasure for me to write this obituary. Jeff sadly passed away last year. But his character and contribution will not be forgotten.*

*Jeff was trained as a Telecom technician and studied the first comprehensive course developed by the TAFE system in 1989 to address training needs in off-grid (then called remote or stand-alone) power systems - solar, wind and micro-hydro. This was at a time when Telecom was being downsized and workers were being given redundancy packages. He then joined my team at the Renewable Energy Centre, Brisbane Institute of TAFE, as a trainer and course developer in the mid 1990s, while installing PV systems throughout SE Queensland. Jeff focused on teaching electrical theory and practice, especially extra-low voltage wiring.*

*Like his fellow Telecom workers who also joined my team, engineer **Paul Monsour** and technician **Dave Keenan**, he was very thorough in his work with great attention to detail. This was a trait that I much admired, and a necessity to ensuring a high standard of stand-alone power system reliability and performance.*

*Jeff worked at the Renewable Energy Centre until 2003 and was the principal author of a training manual for extra-low voltage and wiring, as well as being a contributing author to training manuals for solar PV and hybrid power systems. These manuals were part of training materials developed for national training in renewable energy and funded through the Australian Cooperative Centre for Renewable Energy (ACRE).*

*Jeff was a committee member for the development of* Australian and New Zealand Standard AS/NZS 4509 – Stand-alone Power Systems. *After that he worked with **Geoff Stapleton** and others in inspections of off-grid systems throughout eastern Australia. As well he assisted the Solar Energy Industries Association and the Business Council for Sustainable Energy (now the Clean Energy Council, CEC) with information for installers, including installer maintenance guides, checklists for off-grid and grid connected PV and a spreadsheet for designing off-grid PV systems to AS/NZ 4509.*

*Jeff will be much missed for his valuable contribution to achieving quality system design and installation.*

[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.

[ii] Exemplary uses CSIRO's Projected Change Values to produce Ersatz Future Meteorological Years (EFMYs) for two scenarios for 2030 and four scenarios for 2050 for 80 locations. These are available for purchase.