

Can electricity consumption patterns tell us anything about the pandemic?

Understanding effect of COVID-19 using real time data is hard. Electricity like all other sectors is affected heavily due to this virus. Electricity patterns explain a lot about Consumer and business behavior. In this report, electricity consumption in Victoria will be discussed over the period of 3 years from 2018- 1st October, 2020. Some of the key take ways from this summary report are:

1. In Quarter 1,2020 starting from January, the demand was lowest as compare to 2018-19 in Victoria.
2. There was a steep increase in demand as the pandemic hits everyone's life. Australia declare the lockdown after mid-march and demand of electricity increase in Quarter 2.
3. Starting of Q3 has seen steep increase in demand as compare to last 2 years.
4. The decrease in demand was significant in Q3, 2020 as compare to other two years. During this time, Victoria was under stage 4 restriction and pandemic was at its peak. Victoria recorded highest number of virus cases in this Q3.
5. There was increase in retail price at end if Q2 and starting of Q3 during which the demand decreases significantly.
6. Electricity demand was high from 5am till after noon and then during dinner time in year 2018-19 which remain same in 2020.
7. January was the month with highest demand in 2020, this was the time of bushfires but the pandemic which went throughout the winter has seen less demand.

From these trends and further analysis, we can understand about the behavioral changes during pandemic. Decrease in consumption can explain spending habits of the consumers during a pandemic. The lowest ever demand can tell us that consumer spending has decreased significantly when it comes to electricity, this may be due to the reason that several offices and businesses are closed.

Quarterly Average Demand over 3 years

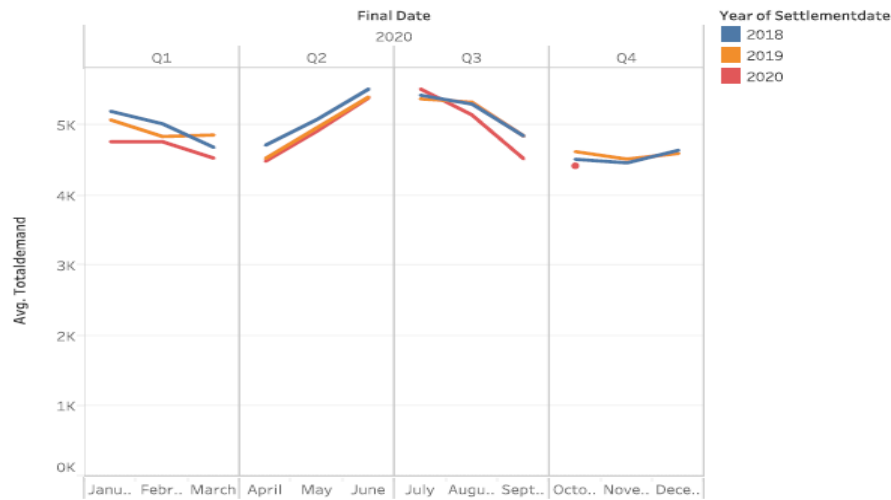


Figure 1: Quarterly demand from 2018-2020

Figure 1 depicts that till now 2020 has overall seen less demand than 2018-2019. The demand was high during Q2 when pandemic started but gradually it decreased in Q3. Q4 can see rise in the demand based on available data as Christmas is approaching and number of cases are decreasing. This may be due to several reasons such as rise in RRP during Q3, loss of income and closure of businesses due to stage 4 restrictions, End of winter and start of autumn, the reasons are numerous. As from above and only above graph it can be interpreted that 2020 was no different trend wise, although the demand is affected but the trend is same from 2018-2020.

Change in RRP over 3 years

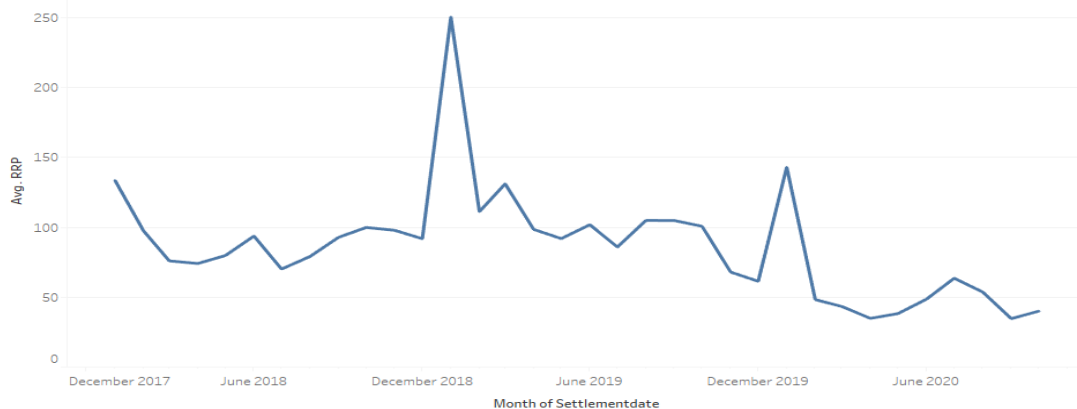


Figure 2: Change in retail price over 3 years.

The retail price hasn't changed significantly, in fact year 2020 has seen lowest rise in prices as compare to previous years. From RRP, we can confirm that Demand was not decreased in 2020 due to prices. There may be several other factors but price is not the one affecting the demand.

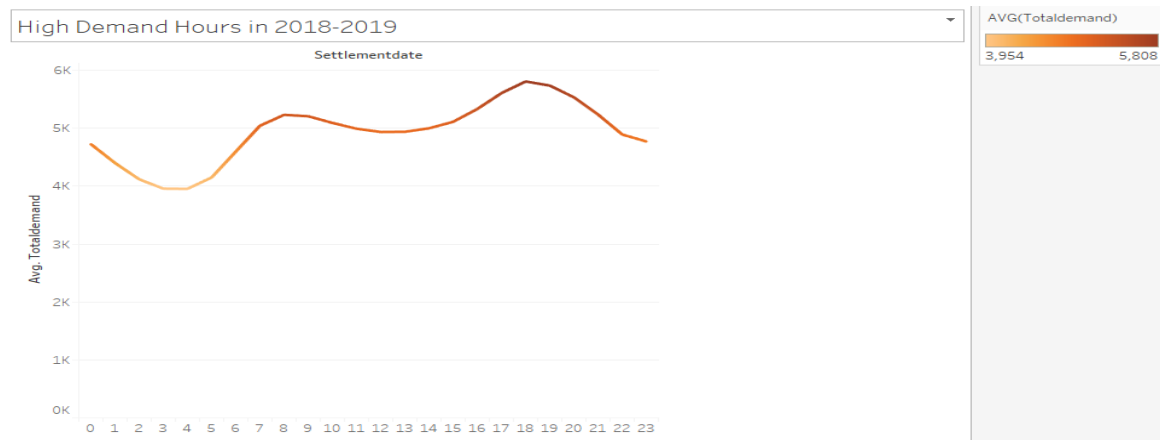


Figure 3: Consumer demand hours in 2018-2019

In 2018-2019, the demand was much higher from 5am – afternoon and then from 18:00 till 22:00. The demand was at peak during office hours and dinner hours in 2018-2019 where as in 2020 the demand was high during the day. It can be depicted from this that businesses have high consumption as comparison to residential areas but during pandemic residential demand has seen nearly 20% increase where as businesses demand has decrease significantly impacting the overall demand.

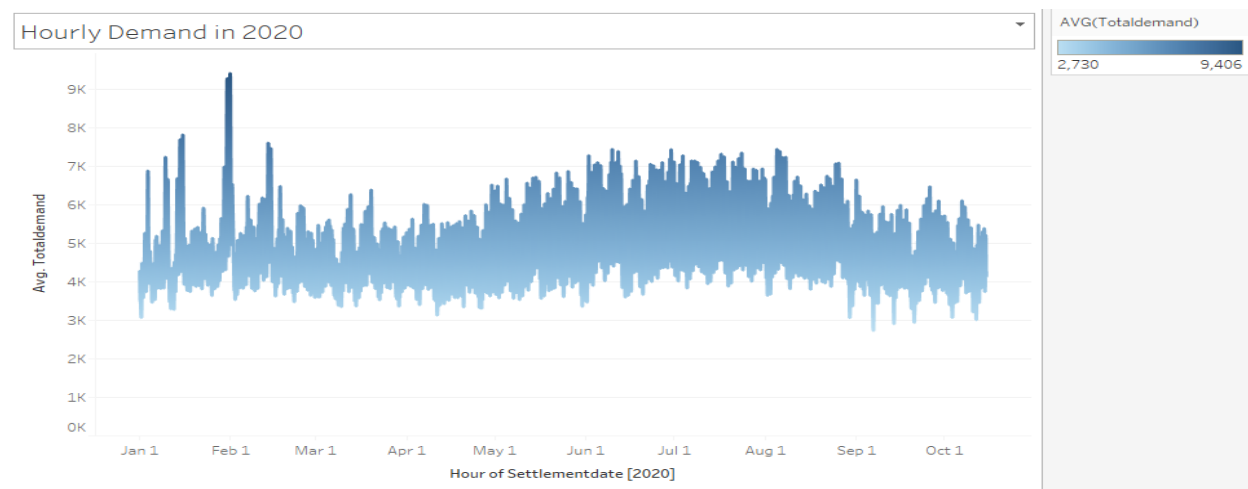


Figure 4: Hourly Demand in 2020

The highest demand in Victoria was seen in January which was new year month and there was no impact of pandemic on Australia whatsoever. This was the month with bushfires, in January only Melbourne was fogged with fire clouds and face its worst pollution till date. This can be one of the reasons of high demand.

The changes in the overall demand were not significant, there was nearly 2% decrease in overall demand which can be due to weather, transfer to new energy source such as renewable or other minute factors.

Current spending habits and trends can give us the idea about the change in demand in residential and corporate areas from which electricity companies can plan ahead. Electricity market is spot market and has huge short-term traders dealing. So a 2% change looks small but in such a volatile market with changing consumption every 30 minutes, this 2% can have significant effect.

Data source: <https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/aggregated-data>

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