**Overview**

A new Electricity Retailer company **Sun Energy** is starting their business operations in Victoria and in need of insights on how the electricity market has been performing in Victoria state. Company needs to understand which parts of Victoria has the highest demand, which areas had highest demand growth, and understand how Melbourne weather is affecting the electricity demand and finally the impact of COVID for the electricity demand.

Company has outsourced this project to a team of Data Scientists.

**Business Problems**

A. Which geographical areas in Victoria have highest electricity demand and demand growth to define the marketing strategy?

B. How weather is impacting the electricity demand in Victoria?

**Background and Data Sources**

Victoria State has five electricity distributors and each are covering different parts of Victoria. AEMO (Australian Energy Market Operator) is the governing body of Electricity market in Australia, which provides historical electricity demand information which includes electricity demand for each 30-minute interval for each distributor from 2011 to 2019. (https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/data-nem/metering-data/victorian-mrim-meter-data)

Electricity customers are mainly two types, Commercial customers and Residential customers. Since electricity demand comprise of both customer types, we could use time of the demand to categorize the demand driver as Business hours demand would be driven by Commercial customers while Non-Business hours demand will be driven by residential customers. Assume Business hours are from 7AM to 5PM on weekdays while rest of the hours are non-business hours.

Victoria postal codes are from 3000-3999 and 8000-8999.

https://www.powercor.com.au/what-we-do/the-network/postcode-network-locator/ is a website which provides who is the electricity distributor when postal code is passed. Capture the postal code and distributor mapping and save it to a csv. (use screen scraping if possible, if not manually derive this)

Google API can be used to pass the postal code and get the location latitude and longitude and Map can be used to visualize data.

BOM provides historical weather statistics for locations (http://www.bom.gov.au/climate/data/index.shtml)

<http://www.bom.gov.au/climate/data/stations/>

**Solution Overview**

Problem A

1. Using AEMO dataset, considering last 12 months electricity demand, show market share for each Distributor in Pie Charts,

-Commercial customer Electricity market share for distributors in 2019

-Residential customer Electricity market share for distributors in 2019

Show in the Map which areas had highest electricity demand in last year. Use different colours to mark different distributor.

2. Considering last 5 years data, calculate electricity demand growth percentage of each distributor for Commercial and Residential markets and show in a clustered column bar chart.

Problem B

1. Check if there is a correlation between Max temperature and Electricity demand for CITIPOWER distributor.

H1 : When Max temperature is > T\_Median electricity demand is > D\_Median

H0 : No such relationship

1. Do the similar analysis for Rain and Solar