A customer has a fleet of electric vehicles (EVs) they want to charge each weekday. There are 10 EVs, each one requires 20kWh of charge per day and they can be charged between 9am and 5pm. Each EV can be charged at a maximum rate of 25kW. We want to find the cheapest charging strategy for the following scenarios:

1. The EV charging energy costs are based purely on the attached wholesale price data.
2. The EV charging energy costs are based on the attached wholesale price data, plus a network tariff that charges $15/kW for the maximum kW demand recorded each month.
3. The EV charging energy costs are based on the attached wholesale price data, plus a network tariff that charges $12/kW for the maximum kW demand recorded each month between 4pm and 9pm on weekdays and $3/kW for the maximum kW demand recorded outside of this peak demand period.

We would also like to see how this charging strategy varies when the EV chargers are installed at a site with existing load using the attached load data.

As output we would like to see the time-series data for the optimised charging strategy. Feel free to plot this alongside the attached data sources if you like. We'd also like to see how quickly the code runs and will ask about how you think it will scale and how easy it would be to generalise to other scenarios.

Data sources

- wholesale_data.csv
  Datetime column and *WholesalePrice* in $/MWh
- load_data.csv
  Datetime column and existing kWh load *E*