

## Assignment 4 Load forecast and EV penetration

Load forecast is very important for power system planning and operation. First visit NYISO website's [Custom Reports](#) to explore all sorts of data out there. We will be focusing on day-ahead market (DAM) forecast (1-hour interval), and actual load (5-min interval), and comparing them and analyze how to make forecast better. Download one whole year (2023) of [Real\\_Time\\_Dispatch\\_Actual\\_Load](#) and [Day Head Market Load Forecast](#) for New York City. (5pts)

- Plot the load curve and load duration curve of New York City.
  - **Load Curve:** Plot the NYC hourly actual load for 2022, highlighting daily, weekly, and seasonal variations.
  - **Load Duration Curve:** Sort the load data in descending order and plot it to show the distribution of demand over time. This reveals the percentage of time different demand levels occur.
- Show the characteristics of hourly load curve of an average day in New York City
  - All days average
  - Weekday vs. weekend
  - Monthly average
  - Seasonal average (Winter, Spring, Summer, and Fall)
- Find the hour(s)/day(s) with the largest forecast error [actual - forecast], and try to explain why (e.g., weather events, holidays, disruptions)?
- Now make reasonable assumptions of EV penetration rate and EV charging in New York City, and try to show how that would change the load curve.
- Should ConEdison/NYPA worry about it, what policy/incentives should you use to change people's charging behavior so to save costs for the utility companies?

### Further reading:

Arvind Jaggi, Senior Economist, Demand Forecasting & Analysis, [Electric Vehicle Forecast Impacts \(Gold Book 2021\)](#)

Play around the [En-ROADS](#) model, and change some of the parameters and check how assumptions affect modeling results.