How to Use Python and Mathematical Modeling to Better Understand the Impact of Electricity Pricing on Consumption

Saba Nejad

November 2, 2023

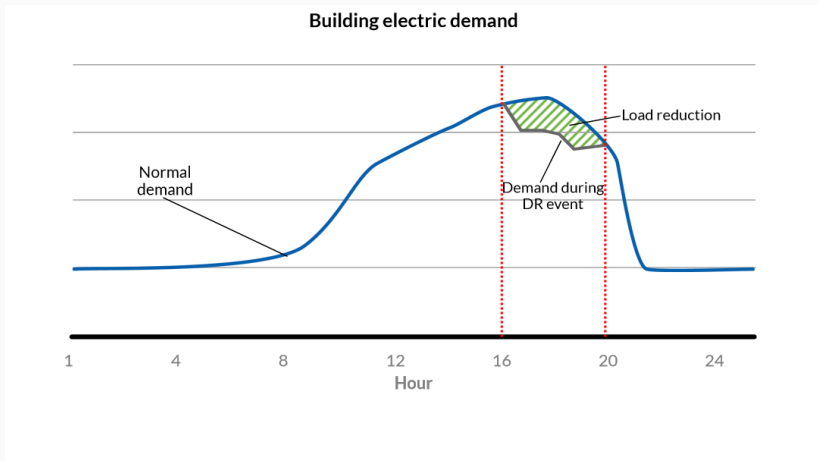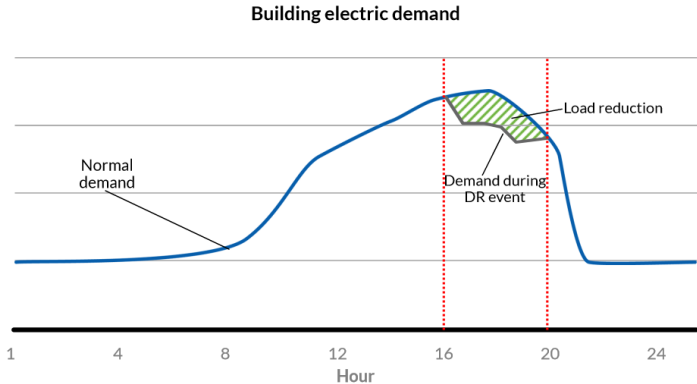PyData NYC 2023

Outline

- Introduce the problem space; defining terminology
- Introduce the trial and the dataset
- Mathematical Model
- Data prep, cleaning, processing
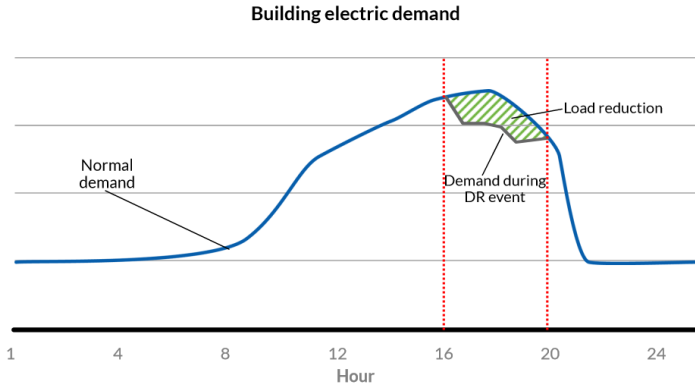- Results

Introducing the Problem Space

Building electric demand

The Power Grid

Building electric demand

system operators: resposible for reliable delivery of electricity to consumers

The Power Grid

Building electric demand

Normal demand

Load reduction

Demand during DR event

Hour

system operators: resposible for reliable delivery of electricity
to consumers

demand response:

3

The Power Grid

Building electric demand

- Load reduction
- Normal demand
- Demand during DR event
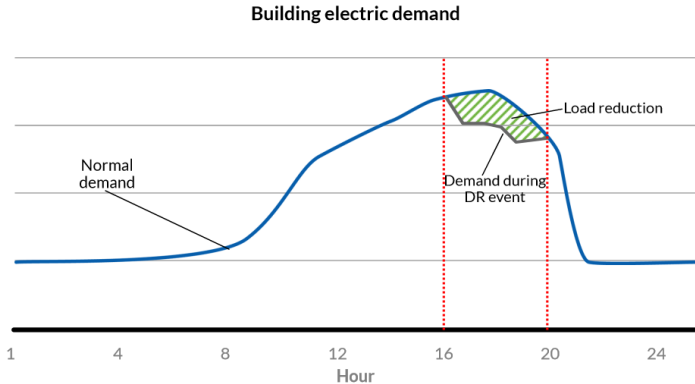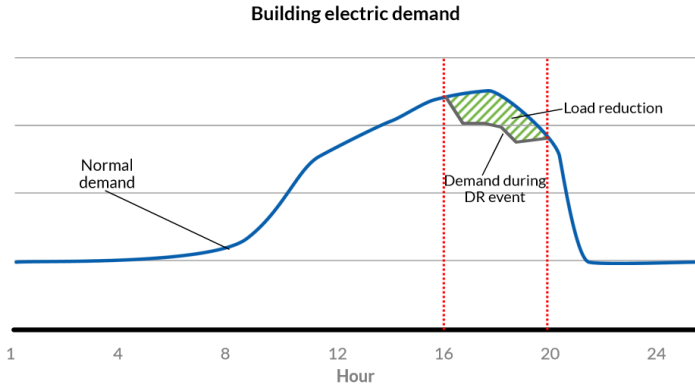
Hour

system operators: resposible for reliable delivery of electricity
to consumers

demand response:

3

The Power Grid

Building electric demand

system operators: resposible for reliable delivery of electricity
to consumers

demand response:

Mathematical Model

motivation and experiment design

motivation and experiment design

shortfalls

a little bit about electricity markets

a little bit about electricity markets

causal analysis

a little bit about electricity markets

causal analysis

break down your data to match the mathematical model at hand

What did we learn?

a little bit about electricity markets

causal analysis

break down your data to match the mathematical model at
hand

how was the data aggregated? is there bias? how does that
impact your analysis and results?

Thank You

- https://github.com/sabanejad
- https://www.linkedin.com/in/sabanejad/