

**MICHIGAN STATE**  

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**UNIVERSITY**

# Beta Presentation

## Electricity Grid Planning Tool

### The Capstone Experience

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*From Students...  
...to Professionals*

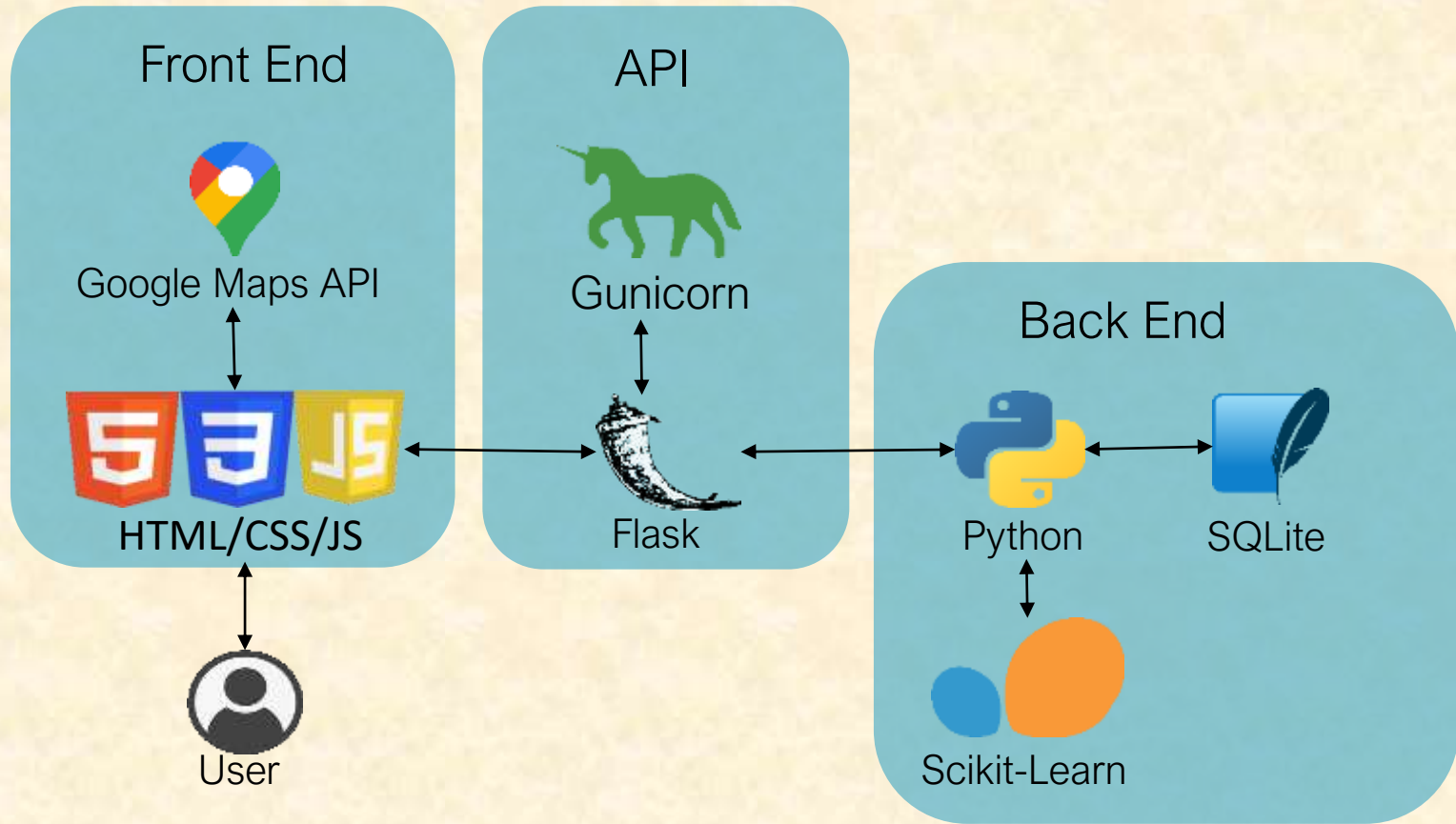
# Project Overview

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- The goal is to help grid planners and policy makers understand the costs and benefits of deploying SMRs at substations in California.
- The tool will be able to make comparisons and create a general overview of statistics on SMR placement.



# System Architecture

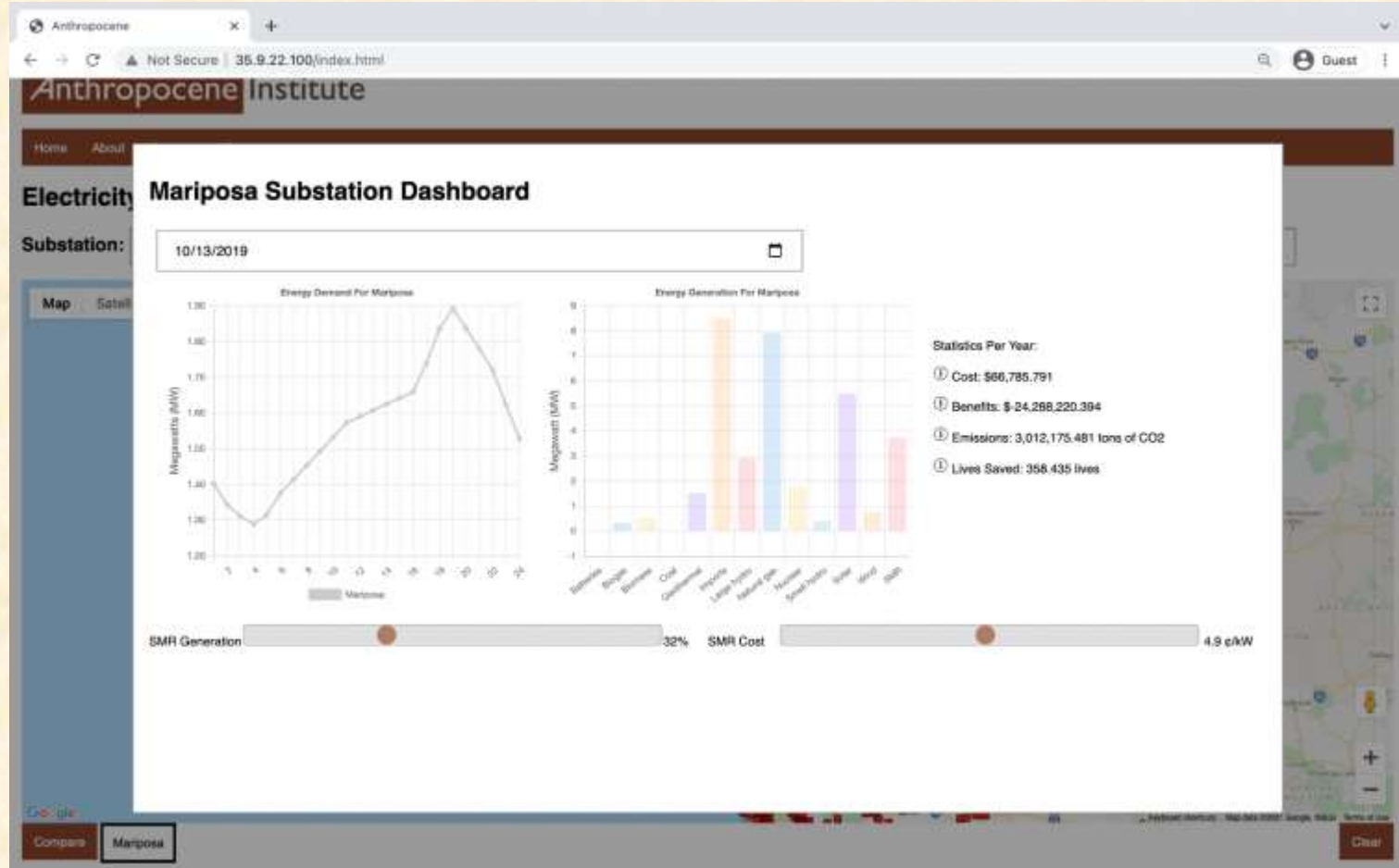


# Substation Map

The screenshot displays a web browser window with the URL `35.9.22.100/index.html`. The page header for the Anthropocene Institute includes navigation links for Home, About, Overview, and Resource. The main heading is "Electricity Grid Planning Tool". Below this is a "Substation:" label followed by an empty text input field. The central feature is a map of the western United States, including California, Nevada, and Arizona, overlaid with a dense distribution of red square markers representing substations. The map interface includes "Map" and "Satellite" view options, a search bar at the bottom left containing "Woodchuck, Division Creek", and a "Clear" button at the bottom right.



# Substation Dashboard



# Overview

Anthropocene Institute

Home About Overview Resources

## Electricity Grid Planning Tool - Overview

County:  Date:

SMR Generation  23% SMR Cost  5.6 c/kW

### Top Substations in Alameda County for SMR Deployment

Show 10 entries

Substation Name	Benefits (\$)	Emissions (tons of CO2)	Lives Saved
Tesla	720,726	176,978,336	21.06
Tracy	714,428	175,431,869	20.876
Newark Distribution	343,896	84,445,262	10.049
Fayette Energy Corp.	338,49	83,117.99	9.881
Flowind Corp.	336,401	82,605,225	9.83
Lawrence Livermore	329,328	80,868,351	9.623
Eastshore	329,067	80,804,34	9.615
Castro Valley	324,316	79,637.86	9.477
Newark	322,633	79,224,278	9.427
Las Positas	316,227	77,651,223	9.24

Showing 1 to 10 of 80 entries

Previous  2 3 4 5 ... 8 Next

Energy Demand For Alameda

Megawatts (MW)

Alameda

Top Substations in Alameda County for SMR Deployment

Benefits (\$)



# Multiple Substations



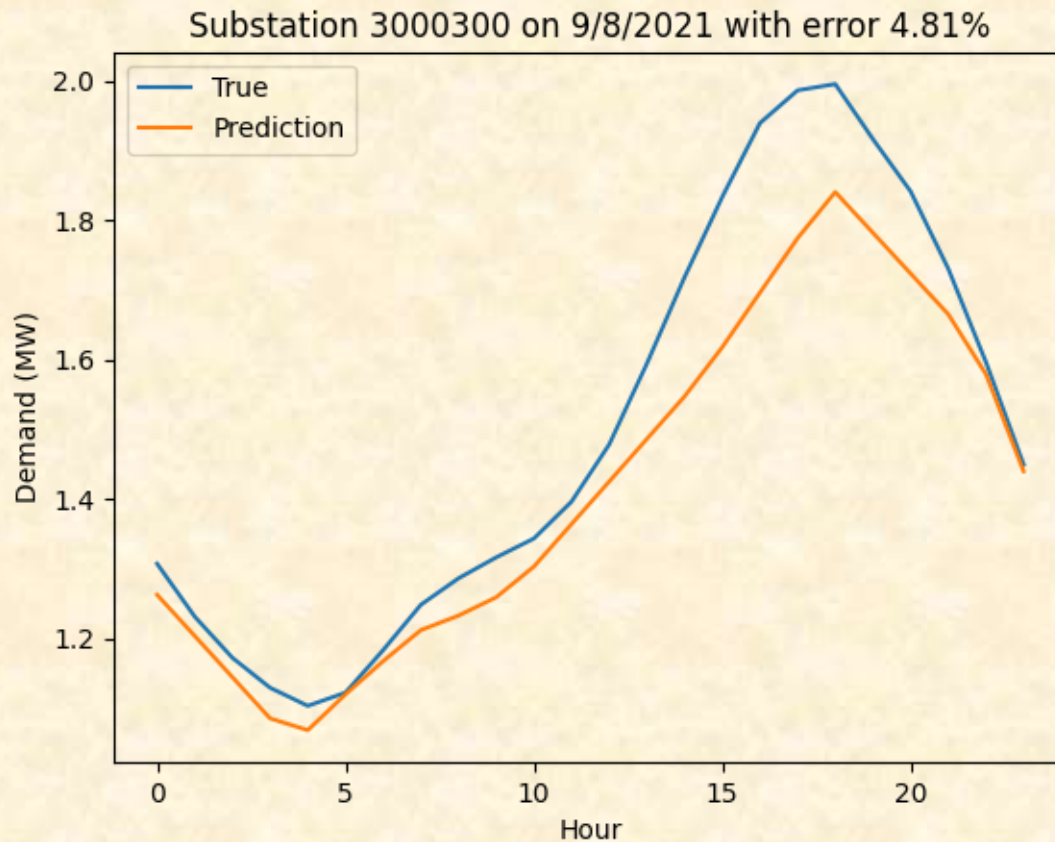
# How It Works

- Raw CAISO Data
- For Each Type Of Model
  - Data Is Synthesized
  - Training
    - Model Input Is Standardized
    - Shuffle And Split
    - Trained with MLPRegressor
  - Score Each Model with  $R^2$
  - Low Scores Are Retrained





# Model Performance Example



# What's left to do?

- Features
- Stretch Goals
  - Power Outage Rates
  - Coloring Substations On The Map
  - Overview “All County” Displaying County Level
- Other Tasks
  - Minor Bug Fixing
  - Organizing/Refactoring
  - Update Visual Elements Based On Feedback



# Questions?

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