

Our project is focused on predicting EV charging load and the required EV charging infrastructure to satisfy it in New England from 2025 to 2045 on the zip code level. Our major target user is the **New England ISO**, the independent system operator for the New England power market and its **CEO, Gordon Van Welie**.

When first deciding on this project, we mostly thought about how this data could be useful for policymakers and the government. As seen locally by MTA's proposal to transition to emission-free electric buses, there have been many policies starting to be put in place to transition to cleaner energy sources. The New England ISO is responsible for the clean energy transition across six states. Furthermore, in New England, states including Massachusetts, Vermont, and Connecticut have mandates for 100% zero-emission vehicle new car sales by 2035. However, there are several concerns about not meeting the demand for EV chargers and the development of charging deserts, regions with no charging ports near them. Since the ISO regulates all utility companies in New England, by making them our target user, we are able to contribute to how utility companies will set up charging stations to address EV charging demand.

In our project, first, we projected New England's EV load in each zip code by predicting the number of EVs that will drive through that location on a given day. This addresses concerns like how the lack of EV chargers in rural New England towns is decreasing tourism. By accounting for how many EVs pass through the zipcode, instead of traditional studies that estimate how many EVs are owned by individuals in that zip code, our predictions highlight regions that other studies might claim have no EV charging load. Additionally, being able to predict the granularity of zip codes allows the New England ISO to understand how to distribute load in their power system. New England EV charging forecast is by eight regions in the entirety of six states. The large geographical area their forecast data considers makes it difficult to estimate which locations have enough capacity to satisfy demand. Thus, by analyzing the data by zip code, New England ISO can ensure enough power is allocated where it is most needed.

Furthermore, we projected, for every month and year up to 2045, how many charging ports need to be installed in each zipcode. Building the right amount of EV infrastructure in the right locations is the ISO's biggest challenge in the clean energy transition. Additionally, the ISO has to guide utility companies and approve their plans for building charging stations. Without an independent investigation, they lack a framework for deciding upon which plans of utility companies should be approved versus denied. Our final dataset offers them a potential framework which can be used to evaluate the proposals of utility companies. ISO can also share this information with energy companies proactively, ensuring they have a better understanding of how electricity demand may increase in the regions they operate.

EV adoption is something that is expected to increase as we focus more on clean, zero-emission energy. Understanding how this increase varies by zip code and how the demand can be met without creating charging deserts is vital. We believe our project will support ISO New England's clean energy transition.