

## Project 1 Write-Up

### Examining Electric Vehicle Adoption

---

Anand Shankar, Anjuli Gairola, Ariel Jones, Brendan Trafford

#### **Outline/Overview:**

Electric Vehicles (EV) have become a hot topic of conversation. Car manufacturers around the world are looking for ways to get in on the trend and provide products that are attractive to their consumers. Even if one's not ready to buy an EV, the data could show opportunities for investment and give drivers insight to make better purchases. With the popularity of EV, our group felt that data would be readily available to answer a few of our questions:

- What makes and models of EV are most popular?
- What is the relationship between EV sales per state and that state's median income and population?
- What is the relationship between the number of EV charging stations in a state and EV car sales?

#### **Data Sources and Models:**

We collected data from a number of sources including:

US Department of Energy: Energy Efficiency & Renewable Energy

World Population Review (US Census Data)

Kaggle datasets on Electric Alternative Fuel Vehicles

US Department of Transportation: Bureau of Transportation Statistics

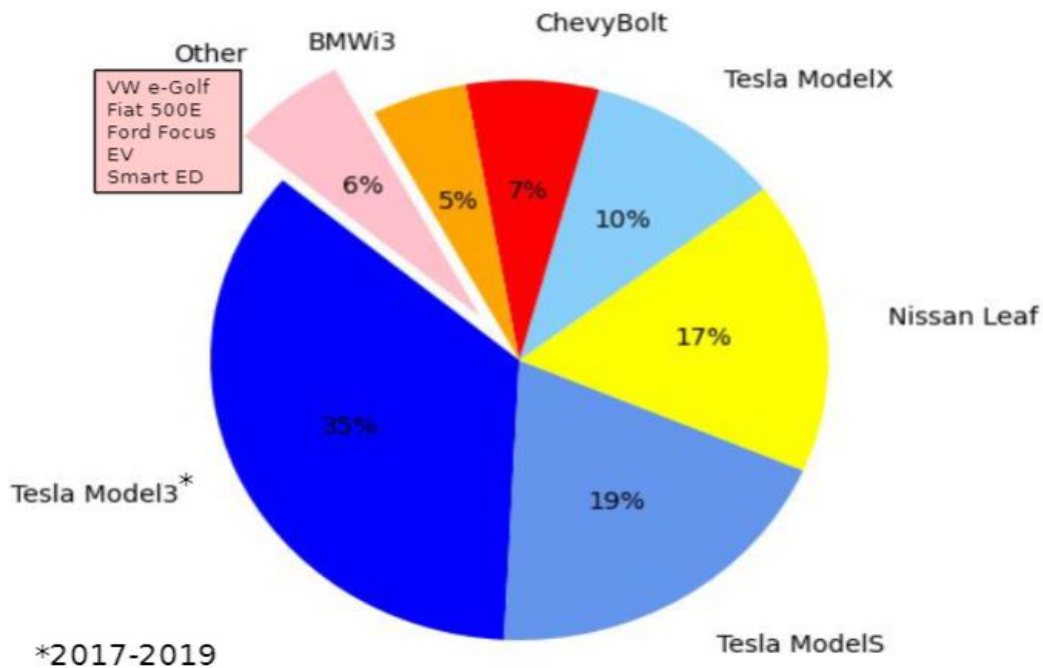
We wanted to make sure to collect data from reputable sources, so it was reassuring to find that government agencies provided free access to this information. It is clear that the political landscape will play a big role in the adaptation of EV and EV infrastructure,

In preparing our models, it was important to calculate the ratios between the factors we examined so that our numbers were more standardized and the relationships between them could be more readily apparent when plotting.

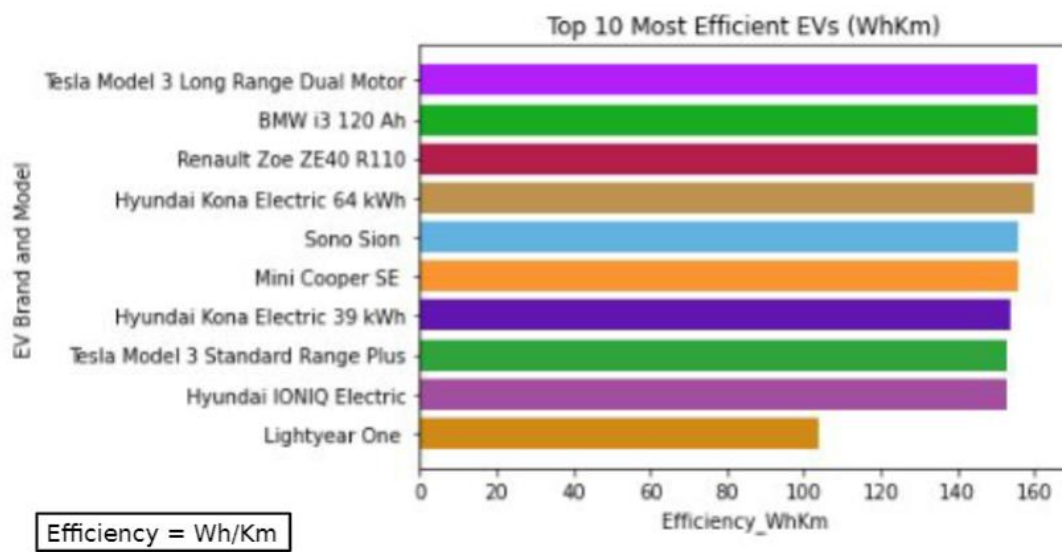
When comparing the number of charging stations to car sales, we had to make sure to examine the number of cumulative charging stations within a state across the years. When we first accessed the data, what we saw in the earlier years of EV adoption (~2016) there were years in which 0 charging stations were built.

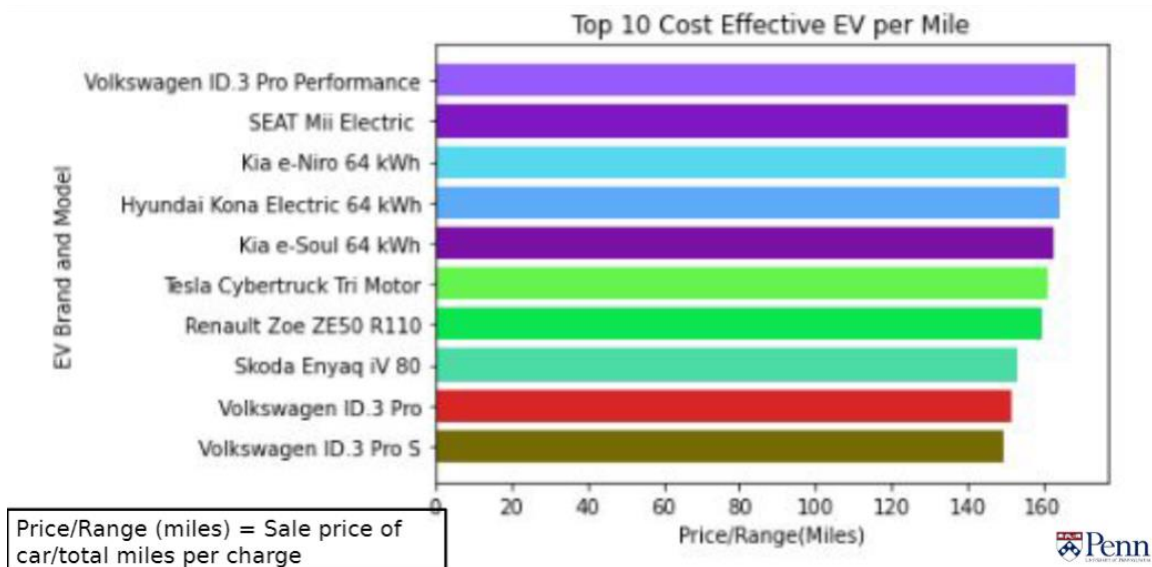
## Conclusions:

*What makes and models of EV are most popular?*



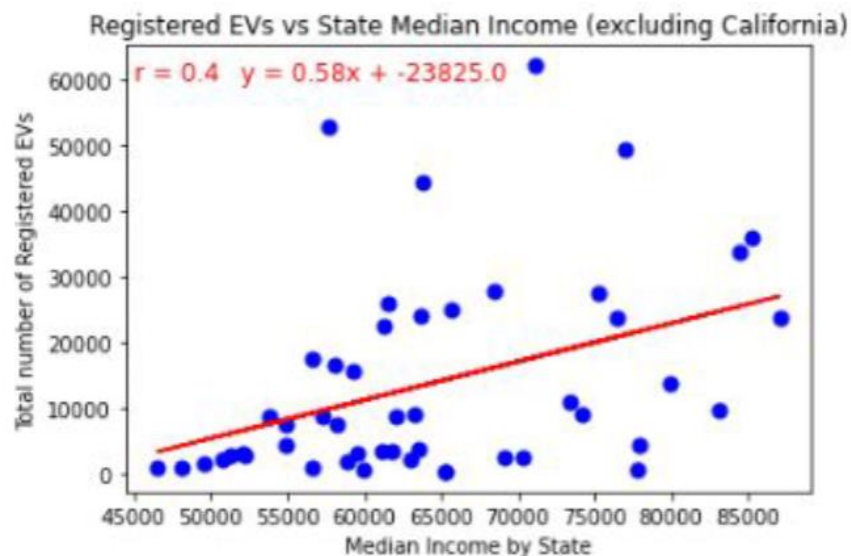
Tesla Model 3, Tesla Model S, Nissan Leaf are the top three sellers, only the Model 3 appeared in the top 10 or top 15 list of our analysis of most efficient EV. So the data that we initially evaluated does not necessarily show why those vehicles are at the top. Some factors or possible limitations of our data sets that could explain this are that the comprehensive list of high performing cars includes a number of vehicles that are not available in the United States.





*What is the relationship between EV sales per state and that state's median income and population?*

Knowing that EV are generally a lot more expensive than gasoline-powered vehicles, we wanted to know if states with higher incomes sold more or registered more EV. It was readily apparent that California was a huge outlier in that the EV sales are very high regardless of the median income. However, even when removing California from the data set, the correlation (.4) between median household income and registered EV still appeared to be weak. This goes to show that there are still more factors that contribute to the popularity of adopting EV than the amount of money that families bring in. These could include social factors, sense of luxury, tax advantages, etc.



*What is the relationship between the number of EV charging stations in a state and EV car sales?*

By having a solid amount of data between the years 2016-2020 we were able to see that there is a strong correlation between the number of EV charging stations and the number of EV sales that year. There were instances where there was a stagnation or slowdown in growth in charging stations, but sales of EV continued to go up.

