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**Topic Choice:**

- Benefit Cost Analysis of implementing Tesla charging stations in \*\*\*Lakeland/Florida Polytechnic within existing parking structures.
  - \*\* - *could become more generic and would need info/the goods from FPU*
- Tesla is still holding about 80% of the US electric vehicle market despite buyers not having access to the federal tax credit anymore unlike they do for some of the competition...but TSLA has a much larger head start than any other automobile company with EV's
  - <https://electrek.co/2020/08/21/tesla-holds-us-ev-market-losing-federal-tax-credit/>
- <http://www.swenergy.org/pubs/azevstudy>
  - [Full CBA was conducted for EV's in AZ]

**Potential Social Costs:**

- Installing a charger at home can be expensive after the costs of the electrician and components. Using a regular wall plug will charge but can be very slow.
  - <https://www.marketwatch.com/story/youll-save-money-on-gas-with-a-tesla-but-also-consider-these-unique-expenses-2017-07-06>,
- The Impact of Charging Plug-In Hybrid Electric Vehicles on a Residential Distribution Grid
  - <https://ieeexplore.ieee.org/abstract/document/5356176>
- This article goes into the potential cost of having unregulated or controlled charging stations in a residential distribution grid. The purpose of the article would be to clarify what costs EV implementation would have, by using the data provided here.
  - The economics of using plug-in hybrid electric vehicle battery packs for grid storages
    - <https://www.sciencedirect.com/science/article/abs/pii/S0378775309017303>
- This article goes through implications of plug in stations for EV vehicles and may help in daily pricing for EV vehicles.
  - <https://www.investopedia.com/articles/active-trading/041515/economics-owning-tesla-car.asp>
    - Using a TSLA Model S as the basis for the individual consumer:
      - Costs: \$69,490 basic model

- Model 3:
  - Costs: \$33,690 for basic model

### **Examples to lean on for BCA:**

#### *Willingness to pay for electric vehicles and their attributes*

- We can use this article for considering what attributes or variables to consider in our analysis based on their survey results
  - <https://www.sciencedirect.com/science/article/abs/pii/S0928765511000200>
- California is mandating only the sale of electric vehicles by the year 2035. Dealerships/companies can only sell electric vehicles – pushing this issue into the forefront and forcing consumers to choose EV's in the near future.
  - <https://www.wsj.com/articles/california-to-ban-sales-of-new-gas-powered-cars-starting-in-2035-11600882738>

“Tesla’s Supercharger network solves the range anxiety issue in three ways. First, the Supercharger network is designed to be large enough to cover key routes so that consumers can have confidence that they can access them when needed. In the United States, we have placed Superchargers across major transcontinental routes, as well as along key routes on the East and West Coasts. In Europe, Superchargers enable long distance travel along key routes in numerous countries, including Norway, the Netherlands, Germany, Switzerland and Austria. And in Asia, we began in 2014 to establish Supercharger stations along key routes in China, Japan and Hong Kong. Second, charging a Tesla vehicle using the Supercharger network is fast enough to comfortably enable long-distance travel. It is designed to replenish up to 50% of the vehicle’s battery pack in as little as 20 minutes. Third, access to the Supercharger network is free for every Tesla vehicle that is enabled with Supercharging capability.”

- As of December 31, 2013, the net book value of our Supercharger network assets, including those in-service and under construction, was \$25.6 million. This amount represented approximately 3.5% on total property, plant and equipment, net of \$738 million and approximately 1% on total assets of \$2,417 million. Thus, notwithstanding the importance of the Supercharger network to the Tesla brand, the cost to build this network has remained small compared with our other capital expenditures, including throughout 2014.
- <https://www.sec.gov/Archives/edgar/data/1318605/000119312515017866/filename1.htm>
- Growing supercharger networks across the world.
  - The Supercharger network currently consists of 1,533 stations with 13,344 Superchargers. [at the time the article was written]
  - Tesla has been talking about more than doubling the network over the next year. [at the time the article was written]
    - <https://electrek.co/2019/07/19/tesla-updates-map-supercharger-stations/>
- 1,971 Supercharger stations with 17,467 Superchargers
  - Superchargers are now being implemented into Urban Areas and where out of town visitors can easily charge

- Placed at convenient locations like grocery stores, downtown districts, and shopping centers so charging fits seamlessly into the life
- Less than the cost of gas – for a baseline of 2,000 miles, gasoline \$271 and supercharger cost is roughly \$155
- \*\*\*\*\*Charging cost estimate assumes Supercharger cost of \$0.26 per kilowatt hour. Gasoline cost assumes 21 MPG for Model X and Model S and 28 MPG for Model 3 at \$2.85 per gallon. Cost may vary depending on the vehicle location, configuration, battery age and condition, driving style and operation, and environmental and climate conditions.\*\*\*\*\*
  - <https://www.tesla.com/supercharger>
- Discusses the costs of installing electric vehicle chargers based on costs of installing past chargers and how implementations in different places will cost different amounts.
  - [https://afdc.energy.gov/files/u/publication/evse\\_cost\\_report\\_2015.pdf#:~:text=The%20cost%20of%20a%20single,51%2C000%20for%20DC%20fast%20charging.](https://afdc.energy.gov/files/u/publication/evse_cost_report_2015.pdf#:~:text=The%20cost%20of%20a%20single,51%2C000%20for%20DC%20fast%20charging.)
- A business model for financially sustainable EV charging networks. Three phases: assess the state of EV charging in Washington, identify and evaluate "innovative business models for EV charging," and made recommendations for how the public sector can support the business models to maximize private sector investment.
  - <https://www.c2es.org/site/assets/uploads/2015/03/business-models-ev-charging-infrastructure-03-15.pdf>