Electric Vehicle Infrastructure in Massachusetts

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Project Goal:
To create a set of recommendations for how the state of Massachusetts can develop adequate infrastructure to support electric vehicles.

Background

• EVs are the future green cars due to the problems with ethanol and hydrogen
• Installing battery switching stations and charging stations is cheaper than installing gas stations
• New methods for funding the Highway Fund need to be created
• The federal government provides a $7500 tax credit on PHEVs and EVs
• Charging stations, battery switching stations already exist, and General Electric is installing 600,000 by the year 2015!
• Other countries and regions of the world are switching over to EVs, including Israel, Denmark, and Australia

Survey Results

If there were a significant increase in electric vehicle infrastructure, I would look into purchasing an electric vehicle

Conclusions/Recommendations

• Massachusetts will need 12,000-15,000 public charging stations or battery switching stations installed in order to support 8,000-10,000 electric vehicles that are predicted to be on the road in Massachusetts by the year 2020
• Public stations should be installed in areas such as commuter rail/MBTA parking lots, shopping malls, and major businesses
• The state should look into joining Project Get Ready and Charge Point America to receive educated assistance for building infrastructure
• Massachusetts should keep the tax incentives relating to EVs in place until battery technology improves significantly or until the cost of EVs is equivalent to a gas powered vehicle

Summary

• Electric vehicles will significantly penetrate the market unless there is a supporting infrastructure
• The impact the proposal may have is that people will switch from gasoline-fueled cars to electric vehicles
• Research involved obtaining public opinion, analyzing market trends, an interview with a state official, and comparing data on gas stations, charging stations and battery switching stations
• Between 8,000 and 10,000 EVs will be on the road by the year 2020 in Massachusetts, and that in order to support that many vehicles, there needs to be 12,000-15,000 public electric vehicle refueling stations in the form of charging stations or battery switching stations
• Battery switching stations and charging stations will be successful in metropolitan areas. These stations will reduce the “range anxiety” most people worry about when buying an electric car

Methods/Process

• Surveyed 554 people from WPI and across the country
• Analyzed the market trends of PHEVs and extrapolated the findings to estimate the predicted number of EVs on the road by 2020
• Interviewed Linda Benevides (EOEEA) to find out what is currently happening in MA. in terms of building EV infrastructure
• Compared and contrasted Gas Stations to Charging Stations to Battery Switching Stations

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References


Benevides, Linda, Environmental Engineer of the Executive Office of Environmental Affairs of Massachusetts. Personal Communication; Adrianzen, D; Darby, K; McCallum, H. 23 November, 2015.


Picture from www.chargepointamerica.com