Can Wind Power be used to Provide Sustainable Energy to Electric Vehicles?

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Over half of the electricity generated in the United States comes from burning fossil fuels. Burning fossil fuels, such as coal and petroleum, releases CO_2 and other harmful gasses into the environment. Wind turbines harness renewable wind energy, do not produce CO_2, and have minimal environmental impacts. Electricity produced with wind turbines depends on the speed of the wind. In most places, however, it is windy late at night (when the demand and price for electricity is lowest) and calm during the day (when the demand and price for electricity is highest). In fact, wind turbines are sometimes forced to shut down at night because they generate more electricity than can be sold. This reduces revenues produced by wind turbines and dissuades further investment.

Electric vehicles are a potential solution to this issue. Charging electric vehicles requires significant electricity, and most electric vehicles are charged at night. Therefore, electric vehicles are potential customers for the electricity wind turbines produce at night. Matching supply and demand in this manner could increase investment in wind turbines and the number of emission-free electric vehicles.

This project investigates the correlation of electric vehicle charging and wind power generation in the Pacific Northwest. Real-world datasets are used to compute correlation coefficients and other statistical measures of association. The research will conclude in the submission of a technical conference paper