

Power Generation by Wind Turbines Across Highways

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Abstract: *The rapid growth in energy demand and environmental concerns has accelerated the search for sustainable and innovative energy solutions. Wind energy is one of the fastest-growing renewable energy sources; however, its efficiency is often constrained by inconsistent natural wind patterns. This research presents a novel approach to harnessing wind energy by utilizing the airflow generated by moving vehicles on highways. By strategically placing wind turbines on highway medians, this system leverages bidirectional wind flow from both sides of the road, ensuring a consistent and substantial energy source. The study focuses on the aerodynamic design, feasibility, and optimization of wind turbines specifically engineered to operate under vehicular-induced wind conditions. Computational simulations and experimental analysis are conducted to evaluate power generation potential and efficiency. This system is a smart and eco-friendly way to add renewable energy to what we already have. It works by capturing wind energy created by cars and trucks as they speed down highways—something we usually don't think about but can actually be put to good use. It's a smart and cost-effective solution that transforms wasted airflow into a valuable source of clean electricity. Designed with sustainability at its core, the system not only reduces our dependence on fossil fuels but also helps minimize the harmful emissions typically produced by conventional power plants. By using this often-overlooked energy source, we're making progress in clean energy and helping the environment in the long run. It's a smart move toward a greener, more sustainable future*

Keywords: Electricity Generation, Arduino, Cost saving, Wind Turbine

