

Waste Not, Want Not – The Future of the American Automobile

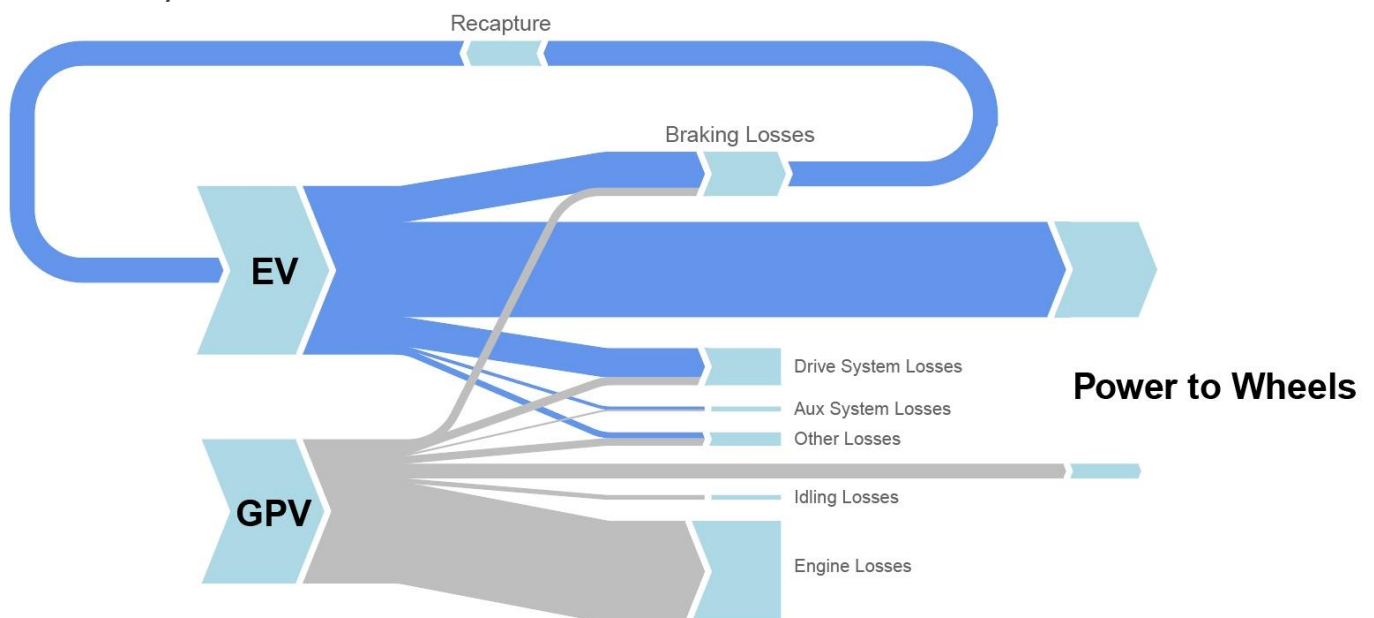
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There are currently around 276,000,000 vehicles registered to travel on U.S. roads. As of 2019, less than 1% of these are electric vehicles (EVs). However, due to a combination of consumer sentiment, shifting government policies, and corporate manufacturing decisions, electric vehicle sales are expected to grow and capture over 30% of the vehicle market by 2030.

At this time, electric vehicles rely mainly on coal fired power plants for battery charging. Proponents of maintaining a continued focus on gasoline powered vehicles (GPVs) point to this as limiting the benefit of electric vehicles. They also note that pollution is generated during the manufacture of EV batteries. However, even taking into consideration production of electricity by fossil fuel, emissions from the making of batteries, and electrical losses during power transmission and charging, EVs produce 40% less CO₂ emissions over their lifetime than GPVs. As power generation infrastructure shifts more toward renewable energy sources, these advantages will become even more pronounced.

Electric vehicles shine even brighter when their efficiency is compared to that of the typical gas-powered car. The figure below shows the power flow through both an EV and GPV when both are supplied with equal amounts of energy. Both types of vehicle lose power through drive systems, and auxiliary systems such as climate control, headlights, etc. Braking losses also occur in both vehicles but the EV recaptures much of this energy and returns it to the battery for re-use. More significantly, the GPV loses approximately 70% of its energy through heat and friction losses in the engine. In all, given equal amounts of energy as fuel, an electric vehicle will be able to apply over six times the power toward the job of traveling down the road when compared to even the most efficient gas-powered car. This effective use of energy makes the EV a smart and conscientious choice.

Efficiency of Electric and Gas-Powered Vehicles



Source: U.S. Department of Energy. Results based on equal inputs of 50,000 BTUs of energy to each vehicle

Arguments remain that EVs have a shorter range than GPVs and can require long recharge times. However, the average American drives only 40 miles per day and most current EVs have a range of 200 miles per charge or more. Electric vehicles appear well positioned to be the smart choice for the future.