

Abstract #: 428

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Abstract Title: Fuel-related Emissions Savings from Electric Vehicles Relative to All-Gas Vehicles

Abstract Text:

Through analyzing a statistically significant sample of residential electric vehicles' (EV) hourly charging data, derived from Pecan Street Inc.'s public database, for a one-year span focusing on homes Austin Texas' Mueller neighborhood, we find fuel-related emissions – in terms of carbon dioxide-equivalent (CO₂e) – for EVs are 57%-71% below fuel-related emissions from traditional all-gas passenger vehicles. Average hourly EV electricity consumption for cars in our sample is 0.267 KWh, which corresponds to an hourly emissions rate of 0.260 lbs. CO₂e, equivalent to 1.11 tCO₂e/year. Traditional vehicles consume zero KWh of electricity, so the annual household electricity emissions rate from fueling a traditional passenger vehicle is 0 tCO₂e/year. Annual car gasoline emissions from EVs in our sample (our sample of EVs includes Chevy Volts) are 0.4-1.12 tCO₂e/year and for traditional all-gas vehicles this number is 5.18 tCO₂e/year. Annual emissions from this sample's average EV are 2.95 tCO₂e-3.67 tCO₂e lower than emissions from a typical all-gas passenger vehicle. Applying this emissions savings rate to a context in which 1.5 million EVs behaved like those in this sample, there would be annual emissions savings of 4.4 million tCO₂e-5.5 million tCO₂e, equivalent to annual emissions from 1 million traditional passenger vehicles, or emissions from one coal-fired power plant.