



2016 Educational Scholarship Amadea Tanner – Second Place Recipient

Pasadena is home to a population of avid drivers, but we're doing the environment no favors by adding to carbon emissions. My solution for Pasadena is a solar-powered car, or more specifically, solar-powered charging stations.

If we're going to continue driving as much as we do, having electric cars still isn't good enough. Electricity used for electric cars is created through the process of burning coal, oil, or natural gas, which combined, generate nearly as many carbon emissions as regular fuel-burning engines. Since Pasadena is gifted with plenty of sunlight, using solar energy is a reasonable practice, especially since solar energy releases no emissions and comes from an unlimited resource.

But we don't need special cars with built-in solar panels to have solar-operated vehicles. We can continue to drive electric—or even hybrid—cars to help our city. Since solar panels themselves generate electricity, they'd be replacing the pollutants from electrical plants and gas stations. Instead of tapping into electrical charging stations that take "dirty" electricity from power plants, we could plug cars into solar charging stations that produce clean electricity from the sun (see drawing 1).

Solar charging stations would function simply due to the fact that cars would park in individual stalls topped with solar cells, which would channel the electricity directly into individual charging stations. Taking the sun's energy would require more time than simply filling up with gas, so it would be most convenient to have these stations at public places where people stay for extended periods of time (ie. grocery stores, shopping malls, fitness centers, etc.) Theoretically, these charging stations could replace many parking lots, such that anywhere a person went for an outing in Pasadena would provide them with a chance to "fill up."

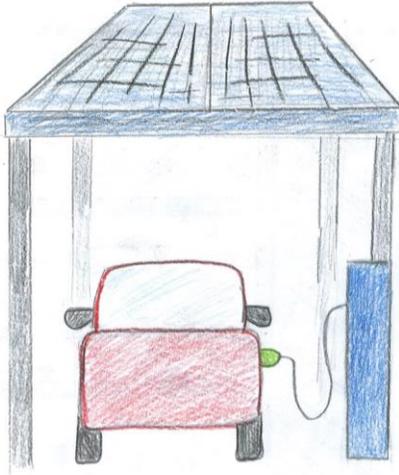
These charging stations would need to be justified by more electric cars in Pasadena, and even though solar panels aren't cheap, when used for public purposes, they could be paid for through state and federal rebates, parking fees, or a slight increase in taxes. Furthermore, if people started using solar energy instead of gasoline, they'd save a lot more money on transportation costs too. The typical driver spends \$2,000 to \$4,000 a year on gasoline alone, and the average cost of a car that runs on fuel is \$35,000 (with a fuel economy of 25 mpg). By comparison, the typical electric car wouldn't cost more than \$29,000, and could go anywhere between 60 and 200 miles on a single charge, making car ownership/leasing more efficient and more affordable when applied to electric vehicles.

The benefits of solar-powered vehicle charging should be enough to convince our city's auto dealers to promote electric cars from their manufacturers. A typical car lease lasts three to five years, so it would be easy for a family to switch over to an electric car once it's time for the next lease. Pasadena Water and Power itself could promote the solar charging stations, because this would also benefit the power company by supplying its power grid with any extra electricity that wasn't consumed by vehicles.

Having cars run by solar-generated electricity would benefit Pasadena greatly. Through the use of unpolluted electricity, we would have a cleaner city, a cleaner environment, and most importantly, a

cleaner conscience.

Drawing 1: Close-up of a solar-covered charging station



Drawing 2: Multi-stall solar-covered charging station

