It’s Not Easy Being Green

Fall 2025 1st Alternate Tuesdays 3-4:30 PM, Shapiro AB

Instructor: Rick Hearn
Coordinator: Susan Hanna

Electric Cars

Tuesday, September 23, 2025

This class will be a discussion of electric cars from the point of view of numerous disciplines: Economics, Climate Science, Engineering, Sociology, Politics, and more.

As an example, let’s look at my electric car, mostly because I have its data.

Your Mileage May Vary.

Economics (1):

I drive about 8,500 miles per year. The gas-powered car it replaced averaged about 25 mpg on premium gas at about $5 per gallon, so that is about $1700 per year of gas savings. Let's assume I was spending an equal amount per year on service. So, total of $3400 per year for gas plus service.

Economics (2):

I chose the electric car with the longest range available at that time (2018); it was luxurious and expensive at about $90,000. My fuel and service costs for the electric car are pretty close to zero. (CSUF offers free charging for electric cars and I've had next to no service cost beyond tires and brakes.)

Economics (3):

So, I expect to save back the purchase price over about 27 years. Yeah, in 2045 I'll be 92 so there is the possibility that the car and I won't be around, but I'm an optimist.

Climate Science (1):

A quick Google search says that a typical U.S. gasoline car produces about 4.6 metric tons of CO_2 annually. How much CO_2 was produced to make the approximately 2.6 MegawattHours per year of electricity powering my electric car? None, if you assume all the car's charging came from my rooftop solar system, but that's not true.

Climate Science (2):

How about if all the charging came from the grid? In California in 2024, average CO_2 emissions per MegawattHour of Electricity generated was 0.012 metric tons.

So, CO_2 emissions charging from the grid would be about 0.031 metric tons per year.

Climate Science (3):

The reality is that my car charging is a mixture of mostly charging for free at CSUF from the grid, charging at home from rooftop solar, and charging on road trips from the grid.

Engineering (1):

My car has a 100 KilowattHour battery and two electric motors driving the front and rear axles through reduction gears and differentials. It can accelerate from 0 to 60 mph in 4 seconds and it has fuel consumption of 307 wattHours per mile.

Engineering (2):

My electric car can charge at 150 Kilowatts at a DC fast charger, 17 Kilowatts at my home charger, and 6 Kilowatts at CSUF's chargers. If I want to add enough charge to drive 200 miles, that would take about 45 minutes at the DC fast charger, 3.6 hours at my home charger, or about 10 hours at CSUF's chargers.

Sociology:

How do the neighbors feel about electric cars?

Maybe they think it's "unAmerican" to drive one.

Maybe they think it's being good for the environment.

Maybe they think you're a snob for owning a Tesla.

Politics:

(Let's be gentle with each other on the Politics)

If you believe government should stay out of the subsidy business, then eliminating the electric car tax credit makes sense.

But, then again, should the government continue subsidizing the oil and gas industry?

Other relevant disciplines to consider?

- Aesthetics: How did you feel about the Prius when it first came out?
- What about people who live in apartments?
- Range anxiety
- Hybrids, Plug-in Hybrids, and full EV tradeoffs

Have you been thinking about getting an electric car?

If so, be aware that you must purchase the car by the end of September 2025 to qualify for the $7,000 federal tax credit.