

# THE SECRET LIFE OF AN ELECTRIC CAR



## How renewable is "renewable energy"?

### Climate impacts



Electric cars emit approximately 9 tons of CO<sub>2</sub> equivalent for construction and battery manufacturing, which corresponds to the average US family emission for electricity and gas combined [1,2].

### Emissions



The lifecycle greenhouse gas emissions of electric cars depend on the electricity mix that is used to full them [3]. In general, electric cars are not zero-emissions, as material extraction, battery manufacturing and electricity production all emit during their lifetimes.

### California



California for example, relies on natural gas for half its electricity production. This means that an electric car driven in California does not have zero emissions, and combining the effects of car manufacturing and car operation leads to a ~25% decrease in car emissions when using electric cars compared to regular cars. While 25% may seem large, light-duty vehicles account for just ~ 20% of emissions in the United States [4].

### A climate change solution?



As a result, switching to electric cars, even in states with high "renewable" integration, would lead to an emissions reduction of just 5%. In order to stabilize atmospheric CO<sub>2</sub> to 450 ppm by 2050, industrialized countries greenhouse gas emissions would have to decline by about 80% by 2050 [5]. Electric vehicles would achieve just 6% of this target.



In addition to limiting radical behavioral changes to combat climate change, electric vehicles may actually increase our electricity usage and increase environmental impact. Many individuals with electric vehicles, for example, now own two cars.



One ton of lithium also requires up to 500,000 gallons of water to produce from some of the driest regions on the planet while the mining operations are linked to human rights violations across the global south [6].



### Are batteries really renewable?

The recycling of lithium is complicated due to the material being toxic, highly reactive, and flammable. The high cost of recycling has led to low collection rates and, in most cases, lithium ending up in incinerators or landfills [7].

### Moving forward: sustainable for whom?

The lack of efficacy in electric vehicles to combat climate change IS NOT an indication we should keep relying on regular fossil fuel powered vehicles. Instead, we must strive for more radical solutions and behavioral changes such as:

- Addressing large scale patterns of how we consume goods (in a consumerist society)
- Utilize transportation systems that reduce both fossil fuels AND material consumption (public transit, biking, etc)
- Seek solutions to global climate change that are not predicated on the destruction of other peoples