Mote

Patrick Kennedy Law/2018
Mary Vu Law/2018

Mote

Fleet vehicle carbon capture

UCLA School of Law students Mac Kennedy and Mary Vu founded Mote, a fleet vehicle carbon capture company. Leading our carbon capture team is Joshuah Stolaroff, Ph.D., head of the carbon capture program at Lawrence Livermore National Laboratory. Leading our carbon recycling team is Joseph DuChene, Ph.D., postdoctoral scholar in the Atwater Group at Caltech. We are committed to capturing the CO_2 emissions of buses, more than 99.9% of which run on fossil fuels, until their decades-away electrification.

For the second year in a row, transportation continues to surge above electricity as the U.S.'s largest source of CO_2 emissions—the greenhouse gas most responsible for climate change. By 2030, California must reduce its greenhouse gas emissions by 40% below 1990 levels.

Using our patent pending rooftop mount system, we can instantly decarbonize fleet vehicles at no hassle. Our rooftop mount system holds interchangeable, carbon-capturing filters. Hoses interconnect the system, ultimately attaching to a vehicle's exhaust pipe, allowing us to capture 40 miles of CO_2 at a time. During a driver's meal break, when the filters are near maximum capacity, maintenance workers take five minutes to swap the loaded filters for unloaded ones. Captured CO_2 is recycled into ethylene, the building block of everyday plastic goods.

We charge, per bus, a $10,000 initial fee and a $4,000 annual service fee. This pales in comparison to buying a new $1,000,000 electric bus. We capture CO_2 for $68/ton, half the price of industrial applications (e.g., power plants). We also sell our ethylene byproduct on the commodities market at $125/ton, which is significantly lower than the current market price of $716/ton. By reaching just 5,000 subscribers, which is attainable in California alone, we will eliminate 1,000 tons/day (that is, 365,000 tons/year) while earning a revenue of $108,674,750/year.