California Electric Transportation Coalition

A non-profit association promoting cleaner, healthier air through the development and use of zero-emission electric vehicles, hybrid-electric vehicles, electric mass transit and rail.
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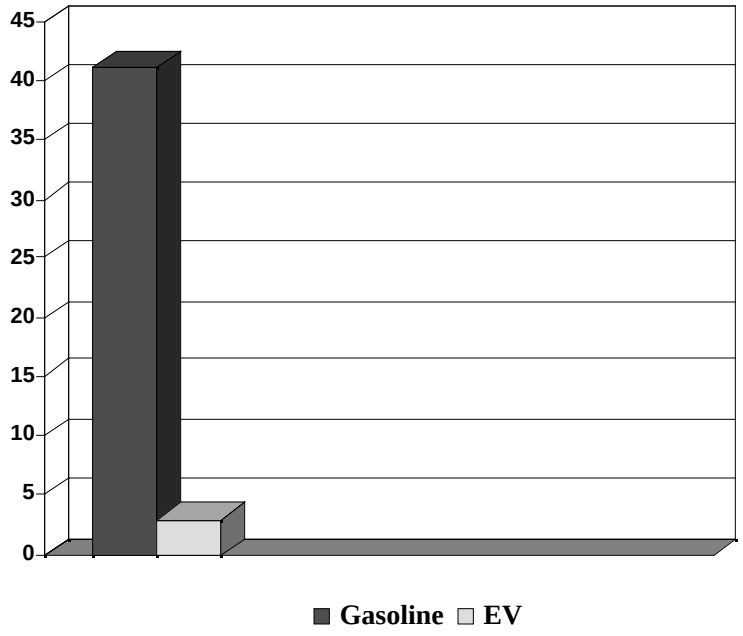
Upstream Emissions: More than the Exhaust from Your Tailpipe

The public health and environmental risks from automobiles cannot be measured by looking at the tailpipe alone. Upstream emissions are pollutants associated with automobiles that do not come from the tailpipe, and all vehicle fuels produce them. For gasoline, combustion, evaporation, and leakage occur during oil refining, fuel storage, distribution and refueling. For electricity, upstream emissions occur during the generation of power.

EVs Reduce Upstream Pollution

Even when upstream emissions are included, electric vehicles (EVs) produce less than 1 percent of the emissions of the cleanest gasoline vehicles available today. By eliminating gasoline, oil and many of the lubricants required for internal combustion engines EVs also reduce the threat of oil and gas spills, water pollution from roadway runoff, and hazardous waste disposal. With zero tailpipe emissions and limited upstream pollution, EVs continue to be an integral part of solving the public health and environmental risks America's transportation system poses.

Lifetime Upstream Emissions of Criteria Pollutants in South Coast Air Basin
(in kilograms)



Upstream emissions for gasoline are more than <u>14 times</u> higher than for EVs.

Source: "Driving Out Pollution: The Benefits of Electric Vehicles," Union of Concerned Scientists, November 1994.

It's common knowledge that EVs eliminate tailpipe emissions, but not so well known that they also reduce upstream pollution when compared to gasoline vehicles. Uninformed critics often make the incorrect assumption that electric vehicles simply shift the source of pollution from the tailpipe to the power plant. This assumption is simply not true. Power plants in California produce much less pollution per unit of energy than gasoline car engines because they use cleaner fuels such as natural gas. And about 30% of California's plants are hydroelectric, geothermal, wind or solar and produce no air pollution at all.

Further, it is much easier to control pollution from one large engine, like a power plant, than thousands of small engines in vehicles. And power plant emissions will always be easier than controlling the multiple sources of upstream pollution associated with gasoline vehicles. Presently, California power plants employ the most sophisticated emissions control equipment in the world.

With electricity industry restructuring, increased competition is creating new opportunities and incentives to improve power plant efficiency and lower emissions. Power plants are already twice as efficient as conventional gasoline cars, and the newest plants offer opportunities for even higher efficiencies. And, as power plants are replaced or re-powered, they must meet stringent new emissions standards.

Sources for investigating these issues further:

Driving Out Pollution: The Benefit of Electric Vehicles, Union of Concerned Scientists, November 1994.
Electric Vehicles Bring Large Long-term Pollution Cuts, EPRI Fact Sheet, 1995.
Guidance for Power Plant Siting and Best Available Control Technology, California Air Resources Board, July 22, 1999.
The Case for Electric Vehicles, Sperling, Dan, SCIENTIFIC AMERICAN, November 1996.
Inventory of Greenhouse Gases and Sinks***: 1990-94***, U.S. EPA, www.epa.gov/globalwarming.
GREET 1.0 Transportation Fuel Cycle Model, U.S. DOE, Argonne National Laboratory, June 1996.