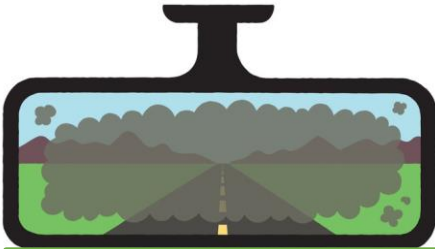


ENERGY EFFICIENCY

&25* lb CO₂ /GAL

Unit 10 & 11 Dr. John P. Cise , Professor of Physics, Austin Com. College , 1212 Rio Grande St., Austin Tx. 78701 jpcise@austinctc.edu & New York Times , March 10, 2016. By Daniel F. Becker & Jim Gerstenzang

Stalling on Fuel Efficiency



EDITOR'S NOTE: (-: It's just the nature of combustion that 8 CO₂ Molecules are produced for every Octane(gas) are burned. A gallon of gas weighs 6.2 lb. But, when it burns 25 lb. of CO₂ are produced)-:

INTRODUCTION: * In the combustion reaction, gasoline(aka,octane,C₈H₁₈) combines with atmospheric oxygen(O₂) to produce carbon dioxide (CO₂) and water (H₂O). Of course, we need to balance the equation so the same number of elements enter and exit our reaction: $2C_8H_{18} + 25O_2 = 16CO_2 + 18H_2O$ Thus, **(((for every octane molecule in combustion process, 8 CO₂ molecules are produced)))**6 billion tons/yr. of CO₂ are emitted into the atmosphere by vehicles (see last sentence in article below). The article states world vehicles produce 25 lb. CO₂/Gal. of gas used by cars.

QUESTIONS: (a) Convert 6 billion tons to lb.? (b) How many gallons of gas/yr. need to be burned to produce the amount of CO₂ in (a)? (c) The government EPA site states cars use on average 498 Gal gas/yr. How many cars are on earth?

ANSWERS: (a) 12 X 10¹² lb. , (b) 0.48 X 10¹² Gallons , (c) 0.963 X 10⁶ vehicles , NOTE: Huffingtonpost.com says 1 billion cars exist in the world. So, your solution is close!

THE Obama administration's stringent fuel **efficiency standards are intended to reduce auto pollution and drive up gas mileage.** They are the biggest single step any nation has taken to fight [global warming](#). The rules worked well, at first. They no longer do. They can be fixed. The repairs are all the more important since the [Supreme Court](#) last month put a hold on the administration's plan to limit pollution from coal-fired power plants. **The fuel-economy standards are designed to deliver a new-car fleet averaging 54.5 m.p.g. in 2025.** But this goal is in jeopardy as automakers increase the *production of gas-guzzling light trucks, minivans and most S.U.V.s, which are subject to less stringent standards than other cars.* These vehicles are driving up oil consumption and pollution and putting at risk American compliance with the Paris climate accord. Under the rules, **fuel efficiency rose five miles per gallon from 2007 to 2013. But reports from the Environmental Protection Agency show no overall improvement in 2014 models, the most recent year for which data is available.** And with the production of S.U.V.s, pickups and minivans continuing to rise, fuel efficiency and emissions for 2015 vehicles most likely grew worse, though we won't be able to confirm that until December. From well to wheels, **(((burning a gallon of gasoline spews 25 pounds of greenhouse gases into the atmosphere.)))** Of all the major automakers, American companies delivered the worst fleetwide mileage. Ford's fuel efficiency was 9.2 m.p.g. worse than the industry leader, Mazda, which achieved 37.9 m.p.g. G.M. and Fiat Chrysler were worse than Ford. **Only Honda and Hyundai were in full compliance with the standards without resorting to loopholes.** More than three-quarters of **Subarus and Nissans use highly efficient continuously variable transmissions,** but Ford, G.M. and Chrysler use them in only a small fraction of their fleet. **BMW, Volkswagen and Mercedes-Benz use turbochargers, which maximize engine efficiency,** in a majority of their vehicles. **Ford employs turbochargers in nearly 50 percent of its fleet,** but G.M. and Chrysler have left them largely on the shelf. **(((If the rules achieve their goal,** they will cut our payments at the pump, saving consumers as much as \$8,000 even after they pay for the technology that delivers better mileage; **ease our oil addiction; and keep six billion tons of carbon dioxide out of the atmosphere.)))** We can't afford to let automakers stop this progress