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Estimate of the total amount of gasoline consumption since the invention of the car

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Energy

How many grams of gas has been burned by all of the cars in the world ever since the invention of the automobile?

Given: 264 gallons = 1 cubic meter
 density of gasoline = 740 kg/ cubic meter
 1000 grams = 1 kg
 Mass = Density x Volume

Number of years we've had cars: [100]
 Miles per gallon average of the first 50 years: [10]
 Miles per gallon average of the last 50 years: [25]
 Cars driven in the first 50 years: [500,000,000]
 Cars driven in the last 50 years: [5,000,000,000]
 Number of people who have driven: [2,000,000,000]
 Average miles driven on each car: [300,000]

Assuming that we have been driving since the year 1909, 100 years ago (as of 2009), I can estimate that there were around 5,500,000,000 automobiles driven.

I would then find the average miles consumed per gallon over the 100 years of time.

$$([10 \text{ mpg}] + ([25 \text{ mpg}] * 10)) / 11 \sim [23.5 \text{ mpg}]$$

1:10 ratio

5,500,000,000 cars have all totaled 300,000 miles during its lifetime with a 23.5 mpg.

$$([5,500,000,000 \text{ cars}] * [300,000 \text{ miles}]) / [23.5 \text{ mpg}]$$

$$= 70,200,000,000,000 \text{ gallons}$$

Using this figure, and the figure of the drivers in the world who have driven, every driver is accountable for about 3510.5 gallons of gas consumption.

To convert this measure into grams:

$$70,200,000,000,000 \text{ gal} * (1 \text{ cubic meter} / 264 \text{ gallons})$$

$$= 266,000,000,000 \text{ cubic meters}$$

$$266,000,000,000 \text{ cubic meters} * (740 \text{ kg} / 1 \text{ cubic meter})$$

$$= 197,000,000,000,000 \text{ kg}$$

$$= 197,000,000,000,000,000 \text{ g}$$

How much energy stored in gasoline has been used by all the cars in the world, since the invention of the automobile?

Given: 51.6 kJ / 1 g

$$197,000,000,000,000,000 \text{ g} * (51.6 \text{ kJ} / 1 \text{ g})$$

$$= 10,200,000,000,000,000 \text{ J}$$

How long does the Sun have to shine in order to use as much energy as all the cars ever used since they were invented?

Given: Power of the output of the Sun is about 10^{26} Watts
Watt = J/second

$$\text{Sun's energy: } 10^{26} \text{ W} = [10,200,000,000,000,000] / (\text{seconds})$$

$$= 0.000000000102 \text{ seconds}$$

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