DOE Hydrogen and Fuel Cells Program Record		
Record #: 11002	**Date:** January 5, 2011	
Title: Number of Cars Equivalent to 100 Metric Tons of Avoided Greenhouse Gases per Year		
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Approved by: Sunita Satyapal	**Date:** January 25, 2011	

Item:

A conventional mid-size gasoline car emits 0.45 kg of greenhouse gases (GHG) per mile.[1] One hundred (100) metric tons (t) of GHG per year are equivalent to emissions from 17 conventional gasoline cars.

Data and Assumptions:

The GHG emissions cited above are from an analysis record prepared by the Department of Energy's Fuel Cell Technologies and Vehicle Technologies Programs on life-cycle emissions of greenhouse gases and petroleum use for several light-duty vehicles.[1] For cars that are between 1 and 5 years old, the average mileage is approximately 13,000, based on Table 8-9 of the Transportation Energy Data Book.[2]

Calculations:

GHG emissions per year = GHG emissions per mile × annual mileage

$$\text{GHG emissions per year} = 0.45 \text{ kg/mile} \times 13{,}000 \text{ miles/year per car}$$
$$= 5{,}850 \text{ kg/year per car}$$
$$= 5.85 \text{ t/year per car}$$

Number of cars equivalent to 100 t of GHG emissions per year
= 100 t/year ÷ GHG emissions from one car per year

Number of conventional gasoline cars equivalent to 100 t of GHG emissions per year

$$= 100 \text{ t/year} \div 5.85 \text{ t/year per car}$$
$$= 17 \text{ mid-size conventional gasoline cars}$$

References:

[1] DOE Offices of Vehicle Technologies and Fuel Cell Technologies – Program Record 10001 "Well-to-Wheels Greenhouse Gas Emissions and Petroleum Use for Mid-Size Light-Duty Vehicles," October 5, 2010.
http://hydrogen.energy.gov/pdfs/10001_well_to_wheels_gge_petroleum_use.pdf

[2] U.S. Department of Energy Transportation Energy Data Book, Edition 29, July 2010.
http://www-cta.ornl.gov/data/download29.shtml