

GPM, Not the Metric System

Prepared by Rick Larrick and Jack Soll. Last updated June 23, 2008. This note provides additional materials regarding Larrick, R. P., & Soll, J. B. (2008). The MPG illusion. *Science*, 320, 1593-1594.

This note considers two issues regarding GPM and the metric system and was last updated July 12, 2008:

Section A. Would adopting GPM be as difficult for the US as adopting the metric system?

Section B. Would adopting the metric system cure the MPG illusion?

Section A: Is GPM Hard to Adopt?

Many people have asked whether adopting a GPM measure, such as gallons per 10,000 miles, would be as futile as the attempt to go metric in the 1970s. We think the analogy is a poor one and that GPM adoption will be relatively easy. Here are a few basic reasons:

1) The imperial system of measures contains no flaws except the difficulty of reasoning with bases of 12 (inches) and 16 (ounces). It yields no incorrect inferences. MPG, however, does lead people to make mistakes about the value of fuel efficiency.

2) GPM measures use two familiar measures: gallons and miles. Unlike “deciliters,” there is no mystery as to the quantities. (How big is a deciliter? Is it 10 liters or 1/10th of a liter?).

Moreover, 10,000 miles is a realistic and familiar figure. It’s how far many people drive in a year. It is easily adjusted if one drives a different distance.

3) No “system” needs to be put in place that would require learning how to translate up and down an unfamiliar scale (millimeters, centimeters, meters) or between scales (meters to grams to liters). Instead, there is a single number that can be added to publications or to car stickers: gallons per 10,000 miles.

4) GPM measures can be used in addition to MPG; GPM contains information that complements MPG. GPM does not need to replace MPG.

Section B: Is Metric Better?

1) Some people have proposed that the U.S. should simply switch to the metric system to solve the MPG illusion (replacing miles and gallons with kilometers and liters). This alone will not solve it. For example, India uses metric scales (kilometers, liters) but puts distance on top of volume (km/l) and, not surprisingly, it creates the exact illusion as MPG. See this story at Livemint:

<http://www.livemint.com/2008/06/19222458/Efficiency-measure-gives-wrong.html>

The key is not whether we use metric or imperial; the key is having the right number in the denominator.

2) Some living in countries that use liters per 100 kilometers, such as Canada, have argued that it has not led consumers to buy more efficient cars. If this is true, we think there are two primary reasons. First, differences in taste make it hard to change car choices with fuel efficiency numbers of any kind. Second, we suspect that 100 kilometers is too small a distance to make differences in gas consumption clear. That’s why we prefer a distance such as 10,000 miles because it makes gas savings clear to see. The analog in the metric system might be liters per 10,000 kilometers. At the point of purchase, this might make car buyers more sensitive when purchasing a gas guzzler.

3) Finally, some living in countries that use liters per 100 kilometers note that this metric makes it hard to calculate the range of their gas tank. That is the one thing that *distance over volume* is good for. *Distance over volume* and *volume over distance* are each useful at different stages of the purchase and ownership process. Thus, we recommend jointly publishing gallons per 10,000 miles *and* MPG, or, in countries that use the metric system, liters per 10,000 kilometers *and* kilometers per liter.