

Calculation of California's Mystery Gasoline Surcharge

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While it is difficult to know the reason that California's gasoline prices have increased so much relative to the rest of the country since February 2015, it is relatively straightforward to calculate just how large that increase has been. To be clear, the Mystery Gasoline Surcharge (MGS) does not measure the amount by which California prices exceed costs. Rather, it measures by how much California prices exceed the prices elsewhere in the U.S. after correcting for differences in taxes, environmental programs, and the additional cost of producing California's cleaner gasoline.

At any point in time, I calculate the Mystery Gasoline Surcharge as:

$$MGS = (Price_{CA} - Taxes_{CA} - Enviro Programs_{CA} - CARB Cost Premium_{CA}) - (Price_{US} - Taxes_{US})$$

where

$Price_{CA} =$	average retail price of gasoline in California
$Taxes_{CA} =$	average of all federal, state, and local gasoline taxes per gallon in California
$Enviro Programs_{CA} =$	per-gallon cost of compliance with California's cap and trade program, Low Carbon Fuel Standard, and UST maintenance fee
$CARB Cost Premium_{CA} =$	an estimate of the additional cost per gallon to produce gasoline that complies with California's stricter emissions standards
$Price_{US} =$	average retail price of gasoline in the U.S. excluding California
$Taxes_{US} =$	average of all federal, state, and local gasoline taxes per gallon in the U.S. excluding California

All variables are measured in cents per gallon, generally expressed in July 2017 constant dollars, using the Bureau of Labor Statistic's All-Urban Consumer Price Index.²

$Price_{CA}$ is the Energy Information Administration's (EIA) California Regular All Formulations Retail Gasoline Prices.³

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² Source: <https://data.bls.gov/timeseries/CUUR0000SA0>

³ Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=emm_epmr_pte_sca_dpg&f=m

$Taxes_{CA}$ is the sum of federal, state and local taxes applied to gasoline sales in California. The federal gasoline tax is taken from the EIA.⁴ The state gasoline excise and sales tax is taken from the California Department of Tax and Fee Administration.⁵ Based on discussions with state government experts, I add a 1% local sales tax, approximating the average local sales tax imposed on gasoline by city and county jurisdictions.

$Enviro\ Programs_{CA}$ include California's cap and trade (CaT) program for greenhouse gases, Low Carbon Fuel Standard (LCFS), and underground storage tank (UST) maintenance fee. The cost of the CaT and LCFS are calculated assuming that the gasoline sold is E-10, which is by far the most common blend of gasoline sold in the United States. The price of CaT allowances is taken from the most recent well-documented sales, either commodity transactions or CARB auction sales.⁶ LCFS credit prices are taken from the CARB's LCFS data dashboard⁷, cross checked with a recent presentation by Stillwater Associates.⁸ The translation from LCFS credit price to cost per gallon of gasoline is based on the CARB LCFS Credit Value Calculator.⁹ The UST maintenance fee is from the California Department of Tax and The Administration.¹⁰

$CARB\ Cost\ Premium_{CA}$, the additional cost to produce California's cleaner-burning gasoline blend, is the least certain number in the calculation. I am not aware of any reliable studies of the additional cost, but it is frequently discussed as being in the range of 10 cents per gallon or less. It was also said to be in that range in the mid-1990s when the fuel was introduced. I assume that refiners have improved their production processes over time. Furthermore, much of that cost premium reflects capital investments made in the 1990s, which have been depreciated over time. So as not to understate this cost, I assume that it is a constant 10 cents per gallon in nominal dollars. With a CPI base year of 2017, this implies that the cost per gallon (in 2017 dollars) is around 10 cents in recent years, and up to about 16 cents in 2000, the first year for which I do the calculation. This aspect

⁴ Source: <https://www.eia.gov/tools/faqs/faq.php?id=10&t=10>

⁵ Source: <http://www.cdtfa.ca.gov/taxes-and-fees/sales-tax-rates-for-fuels.htm>

⁶ Source: <https://www.arb.ca.gov/cc/capandtrade/auction/auction.htm> . The CO₂e content of a gallon of E-10 gasoline is assumed to be 0.007902 tonnes.

⁷ Source: <https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm>, tab 4

⁸ <https://stillwaterassociates.com/lcfs-credit-and-price-trends/> , slide 15

⁹ Spreadsheet downloadable from <https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm>, tab 7.

¹⁰ Source: <http://www.cdtfa.ca.gov/taxes-and-fees/ust-maint-fee.htm>

of the calculation would surely be improved if there are reliable studies, but the cost that I assume is very likely higher than the true cost, and the very gradual decline in this cost over time seems reasonable.

$Price_{US}$ is the Energy Information Administration's (EIA) United States Regular All Formulations Retail Gasoline Prices¹¹ adjusted to exclude California based on the assumption that California has a 10% weight in the national average, which is approximately California's share of national fuel consumption.

$Taxes_{US}$ is the sum of federal and state taxes applied to gasoline sales in the US adjusted to exclude California based on the assumption that California has a 10% weight in the national average.¹² Note that I do not adjust for local fuel taxes outside of California. Though they are quite small on average, to the extent that they exist and are not included, this would tend to bias downward my calculation of the MGS.

Throughout these calculations, I assume that all of the taxes, fees, and differential costs are passed through 100% to consumers. This seems like a reasonable assumption, which has been supported by many studies of gasoline prices, but it is almost certainly not precisely correct in all cases. Still, given that the MGS has increased drastically since 2015, during a time in which California taxes and fees increased relative to the rest of the country, this assumption would only yield an explanation for finding a larger MGS if the actual pass-through were far greater than 100%.

¹¹ Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=emm_epmr_pte_nus_dpg&f=m

¹² Source: <https://www.eia.gov/tools/faqs/faq.php?id=10&t=10>