

U.S. DEPARTMENT OF THE TREASURY

The Price Impact of the Strategic Petroleum Reserve Release

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To help address rising energy prices and mitigate a shortfall in the production of oil owing to Russia's war in Ukraine, President Biden in March of this year [announced](#) a historic release of oil from the Strategic Petroleum Reserve (SPR). Following this action, the Department of Energy is in the process of [releasing 180 million barrels](#) from the SPR over six months while International Energy Administration (IEA) partners are releasing an [additional 60 million barrels](#). This blog presents analysis estimating the impact of this release on the price of retail gas in the United States.

We use two approaches to calculate the impact of oil releases: the total change in stocks (a change of 180 million to 240 million barrels) and the flow change in barrels (a change of 1.0 million to 1.33 million barrels per day). Both measures have merit. [A 2017 study by Richard Newell and Brian Prest](#) argues that the change in stocks is a more appropriate measure, as it includes market expectations, although their analysis models considerably smaller changes in stocks over shorter time windows. Conversely, for a steady change in supply, it may be more appropriate to model price changes based on flows.

We make several simplifying assumptions. First, we assume that the market clears on the demand side – that is, there is zero elasticity of crude supply. Second, we assume any transportation or issues of crude differentiation are not large enough to have a meaningful impact on prices. Third, we assume the market is driven by fundamentals, so responds to changes in supply and demand, rather than speculation or other drivers. And we present these estimates with the caveat that they are more accurate in the short run than over a longer period.

There are additional factors that could also impact crude prices. First, some of the sales were anticipated in advance. Second, private US crude stocks have increased by 17 million barrels from a low on March 25 to the most recent value on July 15. The impact of these factors is likely second order and not accounted for in our analysis.

We consider large and small options for the demand elasticities, or the responses of prices to a change in supply. Specifically, we use 0.08 and 0.20 to bracket a range of possible short-run demand elasticities but note that higher or lower values are possible.

It is unclear how much of these changes in oil prices were passed through to retail gasoline and diesel prices. In general, we would expect one-for-one passthrough: a \$1 per barrel decrease in crude would lower the price of gasoline by \$1 per barrel, equal to \$0.024 per gallon, since there are 42 gallons of gasoline per barrel. However, recently refining markets have been very tight, and it's possible that a \$1 change in crude oil would not lead to an equal decline in the retail price of gasoline. The following table summarizes estimated impacts of the SPR releases on gasoline prices, assuming full pass-through:

	Demand elasticities	Newell and Prest (2017)
	Price change (\$ per gallon)	Price change (\$ per gallon)
U.S. only	\$0.13-\$0.31	\$0.33
U.S. + IEA	\$0.17-\$0.42	\$0.38

As shown in the table above, our analysis suggests that President Biden's historic SPR release, in coordination with IEA partners, lowered the price of gasoline by 17 cents to 42 cents per gallon, with an alternate approach suggesting a point estimate of 38 cents per gallon. This decline in prices had meaningful benefits for American consumers and helped to mitigate the impacts of rising gas prices on economywide inflation. Moving forward, the Biden Administration is committed to further addressing concerns about rising energy prices.