

November 22, 2021

The Geopolitics of the Strategic Petroleum Reserves

(NB: Due to the Thanksgiving holiday, the next report will be published on December 6.)

During the 1970s, the world economy suffered through two oil shocks. The first, in 1973, was caused by the Yom Kippur War. The U.S. supported Israel, and the Arab states retaliated with an oil embargo. In 1979-80, the Iranian Revolution and the Iran-Iraq War disrupted oil flows from the Middle East, leading to another oil spike. Due to these events, the OECD, through the auspices of the International Energy Agency (IEA), created a member Strategic Petroleum Reserve (SPR) system. This system was designed to be an emergency backup supply of oil and oil products that could be shared to prevent panic buying of oil and to ensure that the economic damage that was suffered due to the 1973 and 1979 oil shocks would never be repeated.

However, as the world moves away from fossil fuels, these SPRs could be holding inventory that will no longer be needed. Simply put, governments that hold reserves could find themselves with worthless inventory. Merchants often find themselves in this situation; a seasonal item remains on the shelf when a season is winding down. A decision has to be made—cut the price to sell out the item before the season ends and lose margin or hold the good and hope that buying emerges to maintain margin. With the SPRs, governments may face the problem of what to do with this oil in the face of falling demand. The decisions that

these governments make will affect oil prices, consumers, and producers in the coming years.

We will begin our analysis with a history of the SPRs, explaining how they work, who has them, and how much oil they contain. From there, we will discuss the difference between a buffer stock and a reserve. Next, we will examine the role of climate change policy on SPR management. How OPEC+ manages its production policy in light of SPR releases will follow. We will close with market ramifications.

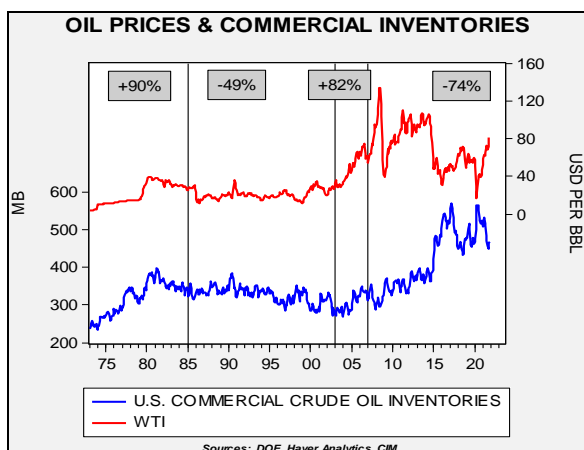
The Creation of Strategic Reserves

In the wake of the 1973-74 Arab oil embargo, the OECD created the IEA. This new body was established to counter OPEC; it gathers a wide variety of data on the fossil fuel market so that policymakers can make informed decisions on energy policy.

Part of the IEA's mission is to manage the OECD's SPRs. Member nations that are net importers of crude oil are required to hold 90 days of the prior year's net imports in SPRs. Essentially, the goal is for nations to be able to overcome a full three-month disruption of imports. In addition, if the OECD declares an emergency, the IEA has the power to coordinate oil flows from the SPR. In theory, this would mean that U.S. SPR oil could be sold to Brazil to alleviate a supply problem. This arrangement has never been fully tested and, in practice, may not work as fashioned. It isn't hard to imagine that Congress would oppose the sale of U.S.-funded oil to a foreign nation even at elevated market prices. Although the political argument for having U.S. taxpayer-funded crude oil go to another

nation is weak, the economic argument is sound. The goal is to prevent hoarding, which can drive prices to damaging levels.

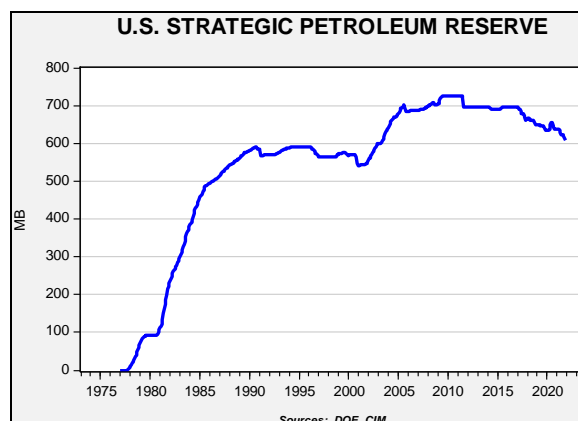
Perhaps the best way to portray hoarding is to view the correlation between commercial inventories and prices.



From 1973 to 1985, U.S. commercial crude oil inventories were positively correlated to oil prices at the 90% level. So, the more refiners stored crude oil, the higher the price rose. Under normal circumstances, one would expect higher inventories (supply) to lead to lower prices. As the above chart shows, there have only been two periods when the correlation was positive. The first occurred during the turbulent years of the 1970s into the early 1980s. The second was during the commodity bull markets in the early 2000s.

Under conditions of hoarding, inventory accumulation becomes a source of demand and has a positive effect on price. One goal of the SPR system is to give consumers confidence that oil will be available and weaken the pressure to bid up prices to secure supply.

The U.S. has built a large SPR, but we have seen the reserve decline in recent years.



The U.S. SPR peaked at 727 mb in 2011 and has fallen to below 610 mb recently.

The [most recent IEA report on total stocks](#) was as of Q3 2020. It suggested that OECD government inventories were at 1.551 billion barrels, or 36 days of demand. Other nations outside the OECD have also created strategic stockpiles. [China](#), which is not a member of the OECD, is thought to have 400 mb of strategic reserves.

Strategic versus Buffer Stockpiles

The goal of strategic reserves is to create an inventory that will act to discourage hoarding. The inventory remains in reserve until there is an emergency, which triggers a release of inventory to reduce supply concerns and at least stabilize, if not reduce, prices. But it isn't designed to fix a price, although its very existence does tend to put a cap on prices.

A buffer stock, on the other hand, is created to fix a price. Economics postulates that market participants can either fix a price and let quantity change or fix quantity and allow for price flexibility. Commodity-producing groups have attempted, on occasion, to create buffer stocks to encourage price stability. The buffer manager buys or sells the commodity to stabilize the price. As long as the target price is roughly in line with the free market equilibrium price, the system can work reasonably well. Of

course, if conditions were stable, it begs the question as to why anyone would create a buffer stock in the first place. Most of the time, producers want prices that are too high and the buffer manager is forced to accumulate ever larger amounts of inventory. If stockpiles become too large, the target price can't hold and the buffer manager will be forced to sell off stockpiles, leading to lower prices.¹

Currently, SPRs use the strategic model; the reserves are not being used to establish a steady price. At the same time, [energy prices are politically sensitive](#). Governments will be tempted to use their SPRs as buffer stocks since their future value is in doubt. However, the very act to cap oil prices will likely discourage investment and production, requiring more rapid SPR sales.

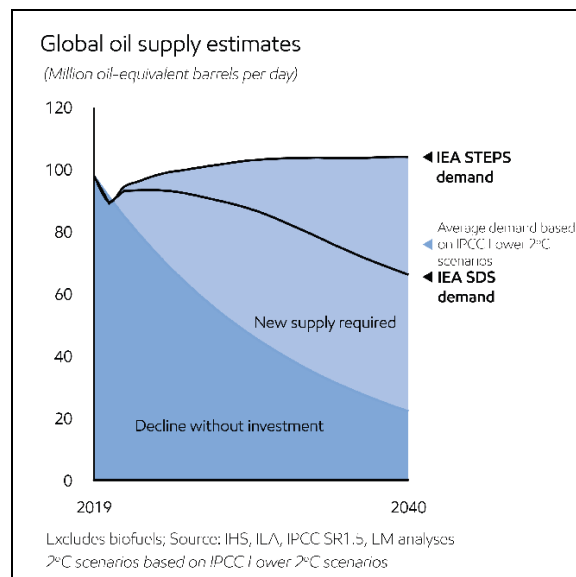
The Climate Change Conundrum

The generally accepted assumption is that, at some point in the future, oil usage will fall significantly. However, the problem lies in the details. For example, how quickly will oil demand decline? Will the decline be gradual or precipitous? Although governments make promises to contain carbon emissions, those promises run head long into the demand for energy that, so far, has not been fully met by sources outside of oil and other fossil fuels. The “free rider” problem from game theory would suggest that there will be little progress because while all nations might benefit from carbon

¹ Perhaps the most visible situation of a buffer stock collapse was the [U.S. sale of cheese and powdered milk in the 1980s](#). The USDA dairy support program set an overly generous price to dairy farmers for milk, forcing the government to accumulate tons of cheese and powdered milk. By the mid-1980s, the “dairy mountain” had become so large that storage costs became unsustainable. Thus, the cheese and milk was “distributed” to the poor in a chaotic fashion.

reduction, a single nation is better off letting others make the sacrifice. Of course, if all nations adopt that attitude, little progress will be made.

Oil and gas companies have to make an assessment of the effectiveness of these promises.



(Source: [ExxonMobil](#) (XOM, USD, 65.02) from IEA data)

The IEA has two scenarios for future oil production. The first, called the [Stated Policies Scenario](#) (STEPS), suggests that there will be some progress toward carbon reduction targets, but all goals won't be met. Essentially, this is a flat production forecast into 2040. The [Sustainable Development Scenario](#) (SDS) assumes the policies necessary to achieve a “well below 2° centigrade” goal. In that situation, oil production will fall by 35% by 2040. And, in the situation where investment in oil production ends now, production will fall by nearly 80% by 2040.

The problem for oil producers is that they can probably assume that future supply requirements will fall somewhere between the STEPS scenario and no investment. That will mean that, at best, investment

should merely match current depletion. The SDS scenario would argue for lower investment going forward. Obviously, underinvestment will likely boost prices, while overinvestment will drive prices lower; the trick is that these supply forecasts suggest lower demand going forward as well.

The SPRs complicate matters further. Take the U.S. SPR as an example. The U.S. currently holds around 605 mb. At \$80 per barrel, the reserve represents an asset worth \$48.4 billion. Obviously, with trillion-dollar fiscal budgets, this amount isn't a game changer. At the same time, this is not an insignificant asset and it is one that will likely become less valuable over time. After all, if electric vehicles become widespread, transportation will steadily decline.

It should also be noted that the U.S. is planning a series of oil sales from the SPR in the coming years. Earlier budget legislation will lead to a [U.S. SPR of 410 mb](#) by the end of 2028, almost 200 mb below current levels. Since the U.S. is a net oil exporter, it is no longer bound by IEA rules requiring an SPR representing 90 days of net imports.

Essentially, oil and gas companies are having to deal with second order effects in terms of SPRs. They know that the best outcome, based on the STEPS scenario described above, is a steady state market and there is a chance they will be coping with falling future demand. At the same time, they have to anticipate the actions of governments surrounding their SPRs. All of these factors increase uncertainty, and, in most cases, elevated uncertainty tends to depress investment.

WDOPECD?

What Does OPEC Do? If the cartel believes that it will face governments moving toward an effective buffer stock model to keep prices capped at an acceptable level, there is no reason for them to increase output; in fact, the rational behavior would be to cut production in order to offset SPR sales. Of course, OPEC+ has to manage a world of flat to falling demand as well. Producers have to decide whether to maximize short-term revenue, which would likely restrict sales, or try to deplete their oil fields as quickly as possible in order to not have a stranded asset.

Our expectation is that OPEC+ will opt for maximizing short-term revenue. As governments try to lower prices by selling SPR oil, the cartel will steadily cut output, thwarting the goals of government. We doubt the cartel will be completely successful, but OPEC+ actions will likely prevent a bear market in oil.

Ramifications

On its face, more rapid depletion of SPRs is bearish for oil prices. After all, the additional supply, in isolation, should lower prices to some extent. However, this position ignores second and third order effects. Oil companies will react to the additional supply, and so will OPEC+. It will be hard to justify supply-increasing activity when governments are purposely trying to reduce prices through strategic sales.

Although this report isn't designed to discuss the climate change issue, one element of reducing fossil fuel consumption is higher prices. It is hard to see how the world can reduce fossil fuel consumption without higher prices; it is also clear that higher prices won't be politically popular. Governments will have to manage that

contradiction. The most likely way it will be managed is to allow oil prices to rise but at a slow pace.

One common adage of commodity markets is that “nothing cures high prices like high prices.” The idea is that when prices rise, it encourages increased production and lower consumption. However, climate policy is thwarting production increases because the policy raises uncertainty about future demand and prices. Therefore, the market can only reach equilibrium from falling demand. Since energy demand usually has

an inelastic demand curve, the demand adjustment can be painful.

We believe price weakness in oil caused by SPR sales will be short-lived and will probably create buying opportunities for energy commodities and related equities. In the long run, energy equities will fade, even if the price of oil and products remain elevated, but that process may take a number of years.

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