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CONGRESSIONAL TESTIMONY OF **JASON E. BORDOFF**

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Chairman Murkowski, Ranking Member Manchin, and Members of the Committee, thank you for inviting me here today to discuss the status of the Strategic Petroleum Reserve and related energy security issues. In my testimony today, I would like to make the following seven points:

- First, the recent attack on key Saudi Arabian oil facilities serves as a reminder of America's vulnerability to global supply disruptions, notwithstanding the dramatic decline in U.S. net oil import dependence. While fortunate to avoid a sharp price spike as a result of those attacks, significant risks to oil supply persist around the world.
- Second, although the U.S. is on the cusp of becoming a net oil exporter—a stunning turnaround from our import dependence just a decade ago—that does not mean America is energy independent. Oil is priced in a global market, so prices in the United States move with the world price whether we import or not.
- Third, despite the shale boom and declining import dependence, the Strategic Petroleum Reserve (SPR) remains a critical national security asset. While the shale revolution does not insulate U.S. drivers from global supply shocks, it does offer an important buffer.
- Fourth, while the U.S. must act to reduce oil use more quickly to address the urgent threat of climate change, the U.S. will use oil for a long time; indeed, a clean energy transition period that is messy, unpredictable, and volatile increases, rather than decreases, the need for the SPR as a tool of transition.
- Fifth, the SPR only serves as a short-term, temporary fix to price spikes. In parallel, it is also necessary to encourage structural reduction in oil use. The best way to protect American consumers from the impact of inevitable global oil price spikes is to reduce how much oil we use in the first place. Higher fuel economy standards are one smart and effective tool.
- Sixth, SPR modernization is necessary to ensure its continued effectiveness, and more rapid progress needs to be made to achieve this.
- Finally, strategic review of the SPR remains needed and should extend beyond just the optimal size of the SPR to include its purpose, composition, and use. In some sense, the SPR is either way too big or way too small, depending on what risks it is intended to guard against. Rather than endeavor to identify its optimal size through cost-benefit analysis, the SPR should be viewed as a tool of risk mitigation and insurance.

Background

Congress authorized the creation of the Strategic Petroleum Reserve (SPR) in the Energy Policy and Conservation Act (EPCA) of 1975 in the wake of the 1970s Arab Oil Embargo as a way to insulate the United States from future petroleum supply disruptions.

As a member of the International Energy Agency (IEA), another byproduct of the 1970s oil crisis, the U.S. is required to hold stocks of crude oil and/or petroleum products equivalent to 90 days of net imports for use in emergency situations.[1] These stocks can be held either in private inventories or directly by the government. As of July 2019, the SPR contained the equivalent of 440 days of net petroleum import cover.[2] That figure has risen in recent years in response to surging oil supply, dramatically reducing the nation's dependence on imports.

The global oil market has evolved considerably since the 1970s. The conditions that prevailed at the time of the creation of the SPR no longer exist. Oil markets have matured and become more globalized and sophisticated than could have been imagined nearly a half century ago. Physical trading is no longer confined to long-term bilateral supply agreements but include spot deals and term contracts, both of which are backed by a deep, highly liquid futures market that did not exist in the 1970s.

Presently, the SPR holds 645 million barrels of crude oil in salt caverns at four sites in Louisiana and Texas. It has capacity to hold 713.5 million barrels. In addition to the SPR, the U.S. government maintains emergency reserves of one million barrels of heating oil and one million barrels of gasoline, both located in the Northeast.[3]

EPCA defines the circumstances under which the SPR may be used. Generally, three possible types of drawdowns are envisaged by EPCA (elaborated more fully in the appendix)[4]:

- Full drawdown: The president can order a full drawdown of the Reserve to counter a "severe energy supply interruption."
- Limited drawdown: Up to 30 million barrels if the president finds there is "a domestic or international energy supply shortage of significant scope or duration."
- Test sale or exchange: The secretary of energy is authorized to carry out test drawdowns and distribution of crude oil from the SPR not to exceed 5 million barrels.

To date, the president has only authorized three emergency drawdowns of the SPR: In 1991, during Operation Desert Storm; in 2005, during Hurricane Katrina; and in 2011, during the Libyan civil war. In addition, there have been a dozen exchanges for various reasons, including the creation of the Northeast Home Heating Oil Reserve to help respond to natural disasters and outages. There have also been three test sales to check for infrastructure and maintenance issues.[5]

In recent years, Congress has authorized sales of the SPR totaling nearly 260 million barrels by FY2027, leaving fewer than 400 million barrels remaining.[6] Nearly all of this has been to fund other priorities unrelated to energy security. An additional $2 billion worth of oil was authorized for sale to fund modernization efforts for the SPR to ensure it can function at its full release capacity. The support for selling off SPR barrels was bolstered by a perception that

because of the surge in domestic oil production, and concomitant decline in imports, the U.S. is less vulnerable to supply disruptions today.

I disagree. "The SPR should not be used like an ATM," I testified before this committee in 2015. "The SPR has served as a critical piece of our nation's energy security strategy since the oil crisis of the 1970s, and it remains so today, despite the sharp reduction in U.S. oil import dependence." That remains as true today as then.

The recent attack on key Saudi Arabian oil facilities serves as a reminder of America's vulnerability to global supply disruptions

On September 14, oil processing facilities in Abqaiq and Khurais in eastern Saudi Arabia suffered a massive attack—allegedly conducted by Iran, although claimed by the Houthi rebels in Yemen. The Abqaiq plant is perhaps the world's most critical piece of oil infrastructure, with the capacity to process 7 million barrels per day. In response to the sophisticated attacks, Saudi Arabia shut down nearly 6 million barrels per day of production—the largest oil supply disruption on record.[7]

When trading opened after the attacks, oil prices soared 20 percent.[8] They quickly pared back more than half of those gains after Saudi Energy Minister Prince Abdulaziz bin Salman and Saudi Aramco CEO Amin Nasser held a press conference on September 17 at which they indicated production capacity would be brought back online quickly and crude exports from the kingdom would suffer only minimal disruption.[9] Saudi Arabia's ability to bring back production more quickly than expected helped avoid a lasting price spike. Oil prices returned to their pre-attack level within two weeks.

In retrospect, it is remarkable that oil prices were so little impacted, even without a release from the Strategic Petroleum Reserve, by the largest oil supply disruption in history. The minimal impact on price can be attributed not only to Saudi Arabia's quicker-than-expected recovery, but also to bearish market fundamentals, notably a weaker macroeconomic and oil demand outlook, rising non-OPEC production, and healthy inventory levels.

Yet this combination of lucky factors that muted the price impact of the Saudi attacks this time should not lead to complacency. Had the attacks led to a more sustained supply outage, especially in a tighter market, an oil price spike would likely have persisted far longer. In such a scenario, an SPR release, in coordination with our other partners in the International Energy Agency, would have been both likely and justified to stem the oil price spike. Indeed, a large and temporary oil supply shock, in this case resulting from geopolitical tensions, is precisely the sort of risk the SPR was created to protect against, giving the private sector time to respond while smoothing the adverse price impact on consumers.

The continued risk to global oil supply is very real. The attack on Abqaiq and Khurais revealed vulnerabilities to Saudi oil facilities that previously were not fully appreciated. There is no reason to believe Iran or its proxy agents could not strike these or other facilities again. Indeed, Iran has targeted oil-related infrastructure in recent months in response to the economic pressure it feels from the renewed U.S. sanctions on its oil exports following America's withdrawal from the Iran nuclear agreement.

Moving forward, as I wrote recently in *Foreign Policy*, "With little prospect of a negotiated

settlement and facing maximum pressure on its economy at home, it would not be surprising if Iran felt it had no choice but to escalate militarily. The president has proven sensitive to oil prices and their domestic effects. Setting in motion a price increase may therefore be seen by Iranian leaders as the best way of matching the U.S. pressure campaign. As with the attacks on tankers transiting the Persian Gulf earlier this summer, the Iranians have demonstrated that they understand very well the global nature of the oil market."[10]

Not only is a further attack that disrupts global supply a real risk, but its impact on the oil market may well be greater next time. Any further disruptions to global oil supply would occur in a market with a very thin buffer of spare capacity, as Saudi Arabia has drawn on its existing spare capacity to respond to the Abqaiq attacks.

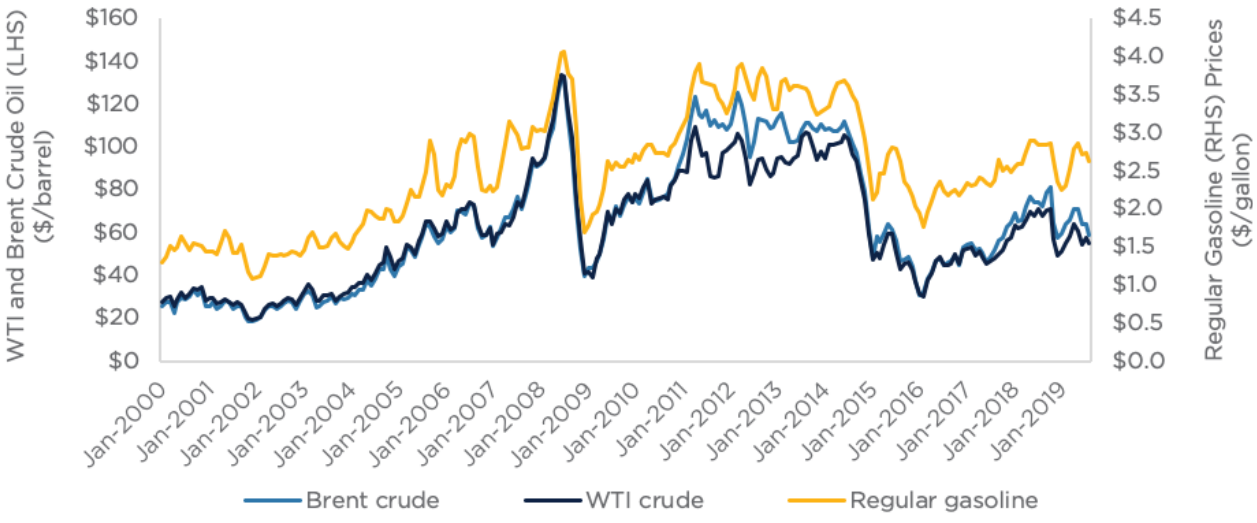
America is not energy independent

As a result of the shale revolution, the United States is on the cusp of becoming a net oil exporter—a stunning turnaround from the country's foreign-oil dependence dating back to the Arab oil embargo of 1973. Nonetheless, U.S. drivers are still very much vulnerable to global supply disruptions such as Abqaiq.

In 2006, the United States imported 60 percent of its oil. As a result of the shale boom, it will be a net exporter of oil annually by next year. While this brings important economic and geopolitical benefits to the U.S., it does not mean we are "energy independent."

Oil is priced in a global market, so prices in the United States move with the world price, whether we import or not. U.S. gasoline prices reflect world oil prices, as figure 1 shows. In an integrated global oil market, the consequence of a supply disruption anywhere is a price increase everywhere—regardless of how import-dependent a consuming nation is.

Figure 1: U.S. Gasoline Prices Still Set by World Oil Price

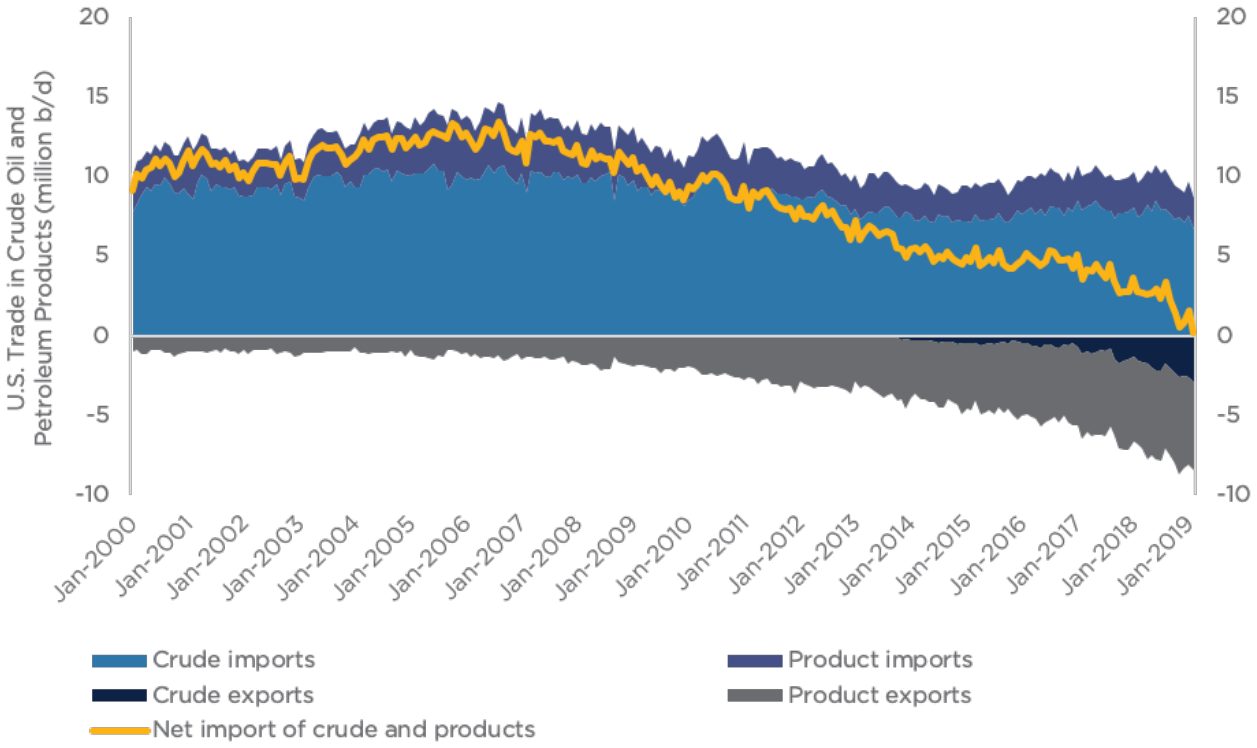


Source: U.S. Energy Information Administration, 2019

Had the price spike following the Abqaiq attack persisted, drivers would have felt the impact at the pump, even though the U.S. imports almost no oil on a net basis any longer. Global supply disruptions, including geopolitics in the Gulf Arab states or OPEC production cuts, still affect U.S. consumers economically.

Moreover, while the United States may not import oil on a net basis, it still imports a vast amount of oil even as it exports growing volumes of crude oil and petroleum products (figure 2).

Figure 2: Net Zero Imports Include Large Gross Imports and Exports



Source: U.S. Energy Information Administration, 2019

U.S. imports of oil from the Gulf Arab region, a focus of American energy security concerns since the Arab Oil Embargo, have fallen, but only modestly, to just below 1 million barrels per day last year (figure 3).

Figure 3: U.S. Oil Imports from the Persian Gulf Have Declined, But Are Still Large

Source: U.S. Energy Information Administration, 2019

The SPR remains a critical national security asset

The stunning surge in U.S. oil production and decline in net imports is not a rationale for selling off the SPR, for several reasons.

First, import dependence is the wrong metric by which to assess U.S. vulnerability to an oil-supply disruption. Unlike in the 1970s, today there is an integrated global oil market with spot cargoes moving around the globe and a robust futures market. As a result, the consequence of a supply disruption anywhere is a price increase everywhere, regardless of import levels. Gasoline prices in the U.S. still reflect world oil prices, so America's vulnerability to global oil supply shocks is determined by how much oil we consume, not how much we import. The risk against which the SPR needs to guard today is a global disruption to crude supply that causes domestic prices to spike, regardless of whether U.S. refineries import from the disrupted countries.[11] Indeed, as of next year, when the U.S. becomes a net oil exporter, we will technically have no obligation to hold strategic stocks. Yet the recent attacks in Abqaiq serve as a reminder that global supply risks still threaten U.S. pump prices.

Second, the underlying logic behind holding public oil stocks remains intact, despite the recent production boom. In theory, private stocks can fulfill our IEA obligation and help cushion global disruptions. To some extent, the government's holding of strategic stocks crowds out private sector incentives to hold inventory. But the full social costs of oil supply disruptions are not borne by companies, and thus they lack adequate incentives to safeguard against them—a market failure that justifies a continued role for government in offsetting supply disruptions. While the government's role is not to guarantee price stability, emergency stocks can smooth economically harmful price spikes until markets are able to adjust.

Third, although the shale revolution continues to deliver remarkable supply increases, many

questions remain about its ultimate magnitude and duration. Shale can be brought to market more quickly, but the flip side is that shale requires continued drilling to maintain, not to mention grow, production. If the resource base begins to decline, technological innovation and productivity wane, or drilling rates slow, shale output could decline in the future as well. It would be shortsighted to sell off a strategic asset the U.S. has held for nearly half a century based on the performance of shale over the past decade.

Finally, even if the SPR is not used, its existence and potential use also affect market expectations and temper price spikes resulting from a disruption.[12] Shortly after the Abqaiq attacks, President Trump stated clearly that he stood ready to use the SPR if it proved necessary, which contributed to the retreat of oil prices. I saw this same dynamic play out when I served in the Obama administration, which ordered an emergency release from the SPR following the Libyan civil war in 2011, which disrupted roughly 1.5 million barrels per day. The following year, in 2012, the impact on the world oil price of sanctions to limit Iranian oil sales and other geopolitical fears was tempered, at least in part, by a perception in the market that the U.S. and perhaps other IEA members might release the SPR if prices rose too far.[13] In the summer of 2012, both the G-20 and G-7 issued statements intended to signal they might tap strategic oil stocks if necessary.[14] Policymakers sent numerous other signals to this effect as well, such as the reported conversation in March 2012 between President Obama and U.K. Prime Minister David Cameron about using strategic oil stocks.[15] As a result, numerous analysts cautioned that the Obama administration might release SPR crude if oil prices rose above roughly $120 per barrel.

While the shale revolution does not insulate U.S. drivers from global supply shocks, it does offer an important buffer

By offering a reminder that America is still connected to a global oil market, the Abqaiq attack belied claims that because of the shale oil boom, what happens in oil-producing countries in the Persian Gulf no longer matters to the United States.

Moreover, while shale is also a short-cycle source of supply that can come to market far more quickly than conventional crude oil production, it still takes 6-12 months.[16] Shale is not spare capacity, which can be brought to market in a matter of weeks and can quickly replace lost oil supply. Saudi Arabia is the only country in the world that holds true spare capacity to any meaningful extent.

That the U.S. is still part of the global oil market and not a source of spare capacity, however, does not mean shale has no impact in protecting America from global supply disruptions. The shale revolution tempers the impact of oil supply disruptions on global oil prices in at least five ways. Furthermore, by eliminating U.S. net oil imports, shale also reduces the harm to the U.S. macroeconomy of global price spikes.

First, the massive increase in U.S. oil production over the last 10 years, the largest addition to global supply over that period of time in history, has loosened the oil market. In response to rising non-OPEC supply, of which shale was by far the greatest source, global inventories swelled above their historical averages, contributing to the oil price collapse of 2014 and forcing OPEC countries to come together to cut production in an effort to bring oil inventories

back down to their historical range. OPEC's ability to do that has also been undermined, as the growth of shale plus other non-OPEC supply has reduced OPEC's share of the global oil market from 70 percent in 1980 to 40 percent in 2018.

Of course, had the shale revolution not occurred, oil supply investment would have flowed elsewhere and other countries would have contributed greater volumes to global supply. But to the extent those other sources of supply are higher cost—otherwise they would have been developed before shale—the total increase in global supply would presumably have been lower than shale provided. Because of shale, any given disruption now represents a marginally smaller share of total global production, so the price impact of disruption would be slightly lower.

Second, oil prices today are likely lower than they would be absent the shale revolution, so any loss in supply is easier for consumers to absorb than it would be if they were already coping with historically high fuel prices. While shale was previously believed to be high-cost supply, technology improvements have brought down the cost of shale supply remarkably and contributed to a decline in the average per barrel cost of finding and developing oil from $30 in 2015 to $15 in 2018. (On the flip side, to the extent shale's supply surge lowered prices, they also led to higher global oil demand, which increases vulnerability to global oil price fluctuations.)

Third, oil prices reflect market expectations of future supply as well as current supply levels, and shale's rapid growth rate—1.6 million barrels per day last year alone—has shifted the market outlook from scarcity to abundance. The impact of a large supply loss on price is lower than it would otherwise be if the market were not anticipating such a rapid increase in production. To be clear, this is a function of shale's rapid rate of growth, not the total level of shale production, and that is a temporary phenomenon. It is unclear how many more years shale can grow at such a robust rate—the outlook for growth next year has recently been downgraded from 1.0 to 0.9 million b/d by the IEA. In the past, producers outspent their free cash flow and focused on production growth. But two years ago, investors started demanding capital discipline, and most publicly reporting producers are now focusing more on returns. Once the rate of growth stagnates, as EIA data is already showing, even if shale production levels remains very high, the effect of rapid growth on future market expectations will abate.

Fourth, the surge in shale production over the last decade, the primary contributor to the oil price collapse of 2014, forced OPEC countries to partner with non-OPEC countries, namely Russia, to cut production to prevent a price collapse. OPEC production cuts, in turn, create a larger buffer of spare capacity to offset a supply loss like Abqaiq and Khurais.

Fifth, because shale is short-cycle and can be ramped up quickly, it reduces the extent to which global supply shocks increase forward oil prices (the price of oil the market anticipates as reflected in the futures curve), which in turn helps bring spot prices down. When oil prices spike, recent experience shows that shale producers hedge their production, locking in the future price at which they can sell their oil. That increases the market's expectation of how much shale oil will be produced in the future. The effect of shale is thus to push the futures curve into steeper backwardation when oil prices spike, keeping the future price of oil from rising as much, even as current prices rise. A more backwardated futures curve creates incentives for commercial participants to use crude stockpiles rather than store them, and that increased supply helps cushion the immediate price impact of a supply shock.

Finally, while gasoline prices that drivers pay still rise and fall with world oil prices, the adverse impact of an oil price shock on the U.S. economy as a whole decreases as our import dependence falls. As the White House Council of Economic Advisers explained during the Obama administration, "the resilience of the economy to international supply shocks—macroeconomic energy security—is enhanced by reducing spending on net petroleum imports and by reducing oil dependence."[17] When the U.S. is a net-zero importer, oil price spikes mean that the increased oil spending flows from U.S. consumers to U.S. producers rather than overseas. This still raises concerns about distributional equity, but the macroeconomic harms are mitigated—although not eliminated, given consumers have a higher propensity to spend. For example, based on historical experience, the oil price collapse of 2014 would have been expected to boost U.S. GDP by nearly one percentage point, but in reality, the U.S. economy saw little benefit from the oil price collapse because the boost in consumer spending was almost entirely offset by a reduction in oil-related investment.[18] Indeed, in several years, when the U.S. is projected to be a large net exporter of oil, higher oil prices may well be better for the U.S. macroeconomy than lower oil prices.

The end of the Oil Age is neither imminent nor a rationale for reducing the SPR

Beyond the rise of shale and fall in net imports, another argument that the SPR is less needed is because the end of the oil age is in sight, thanks to climate action and trends like vehicle automation and electrification. To be very clear, we need to much more urgently reduce carbon emissions and address the threat of climate change. But U.S. oil demand is at its highest level since 2007, and demand growth is projected to continue. Even if demand peaks sooner than expected, the U.S. economy is likely to remain dependent on oil for some time. In a scenario consistent with limiting temperature rise to two-degree Celsius, U.S. oil demand is projected to fall but still be about 14 million barrels per day in 2030, according to the IEA.[19]

Moreover, if oil demand were to peak and begin declining, that would counterintuitively increase rather than decrease the need for the SPR as an energy transition tool.[20]

The transition away from the oil economy is likely to be a period of great volatility in oil markets. Expectations of peak oil demand are already causing shifts in investments in the energy sector. Concerns over stranded assets are leading some major institutional investors to move away from the oil sector altogether. Oil companies themselves are reexamining their portfolios and redirecting investment flows at the expense of long-cycle investments in new oil supply capacity.

While a transition away from oil, were it to occur, would necessarily involve less investment in oil over time, the transition itself will be disruptive and uncertain. Currently, global oil supply declines at a rate of roughly 5 percent of world production per year. That means trillions of dollars of *new* investment is needed to bring 5 million barrels per day of new supply to the market even if oil demand does not grow at all. However, expectations of declining oil demand and uncertainty about the pace of the energy transition may well deter investors.

Suppose oil demand growth is flat next year—and the year after and the year after that. There will be breathless headlines around the world about how peak oil demand has been

reached and projections about oil's impending decline. That may be true, but there will still be a huge amount of uncertainty about oil's demand path. The transition may well be messy and volatile. Growth may stagnate and then resume again—just as global greenhouse gas emissions did over the past five years. Demand may rise at times through periods of growth and then decline, even if the longer-term trend turns down. Yet that may mean periods of both oversupply and undersupply on the path away from oil over time. Uncertainty—and possibly excess hype—about the pace of oil's decline, along with investor pressure, may cause an excessive pull-back in investment.

Moreover, the IEA projects that even in a two-degree scenario, more than $13 trillion of investment would still be needed to meet the world's gradually declining oil demand, compared to $21 trillion of investment that will be needed in the oil and gas sector given the current outlook.[21]

Yet the change in perception from a growing to a dying industry may mean a sharp cutback in investment, falling oil firm equity values, and higher cost of capital. If not properly managed, that underinvestment relative to demand could lead to periods of undersupply, tight markets, and price spikes during the energy transition. The SPR's value in a period of uncertainty and transition is thus likely to be enhanced even if the longer-term trend is toward lower demand. As a result, there is a risk that the industry will divest faster than the energy system can transition away from oil-based fuels, leading to disruptive shortfalls. Expectations of peak oil demand could become disruptively self-fulfilling.

The energy transition could also heighten the risk of instability in key producer countries, leading to dramatic supply shortfalls. On the face of it, OPEC countries, by virtue of being the lowest-cost producers, should be better able to withstand the effect of reduced demand than others. This, however, does not take into account their social spending requirements, which more often than not can be met only through oil export revenues. Should high-cost producers be driven out of the market by reduced demand, there is a risk that oil prices would fall to a level that would undermine the social stability of low-cost producers and disrupt their production, leading to supply shortfalls and volatility.

Far from being made obsolete by the energy transition, therefore, strategic reserves are, in fact, a critical transition tool.

The best protection against global oil supply disruptions is to reduce oil consumption

Because oil is priced in a global market, and gasoline prices reflect world oil prices, the best way to protect drivers from inevitable oil price spikes is not to import less but to use less. Reducing the oil intensity of the U.S. economy lowers its exposure to inevitable oil price spikes and reduces the vulnerability of drivers at the pump to higher gasoline prices. Along with a robust SPR, therefore, policies that reduce oil demand, such as higher fuel economy standards, also help protect American consumers against global oil supply disruptions.

SPR modernization is necessary to ensure its continued effectiveness

In response to a sustained, large-scale supply outage, like Saudi Arabia's 5.7 million barrels per day disruption, the SPR needs to be able to put large volumes of oil on the market to offset the supply loss. The SPR's reported maximum release rate is 4.4 million barrels per day. Experts and analysts widely believe the actual SPR release capacity is far smaller, perhaps 1.5 to 2.5 million barrels per day.[22] This is a severe limitation on the SPR's effectiveness that must be remedied.

The SPR's outdated infrastructure needs to be modernized to ensure that it can remain effective in the event of an emergency by delivering additional and incremental barrels to the market. First, the SPR's equipment and infrastructure is aging and needs to be replaced.

Additionally, the changes in the use of U.S. oil infrastructure, such as ports and pipelines, to accommodate the shale boom have impeded the ability of the SPR to deliver incremental barrels of crude oil to refineries in the event of an SPR release. Moving SPR oil to refineries in the Midwest, as historically has been the case, no longer frees up imported barrels because non-Canadian and Gulf Coast crude has been largely backed out of inland refineries by the unconventional oil boom. That means that SPR crude would need to be moved by ship to East and West Coast refineries. Yet, as a result of the surge in U.S. oil supply, Gulf Coast marine facilities are operating at high capacities. If those dock facilities were used to load SPR crude in an emergency, the result would thus be to crowd out commercial supplies that would have otherwise been loaded, and thus the SPR supplies would not be incremental.[23]

Congress authorized sales of $2 billion worth of SPR crude for the purpose of SPR modernization. To date, the Department of Energy has not made much visible progress. According to the Government Accountability Office, SPR modernization will cost up to $1.4 billion, and according to officials, the agency had spent $22 million as of the end of February 2018.[24]

In addition to modernizing the infrastructure, a recent study by the Center on Global Energy Policy evaluated ways in which improved management techniques could further cut SPR costs.[25] While the benefits of the SPR (in terms of preventing a supply disruption or blunting its impact) are hard to quantify and partly intangible, its current costs are easier to assess. Maintenance and operational costs associated with the SPR, as well as the opportunity cost of locking up large amounts of capital in oil reserves, have spurred calls to reduce this burden by cutting the reserve down to size. Yet since the creation of the SPR, the growing depth, breadth, and sophistication of the global oil market has provided governments with the market tools to lower these expenditures. Better still, the U.S. SPR is a formidable asset that could, under the right conditions, be turned into something of a profit center. Insufficient attention has been paid to the opportunity to reduce SPR operating costs and increase SPR benefits through upgraded inventory management practices and other innovations.

Strategic review of the SPR remains needed and should extend beyond size to include purpose, composition, and use

Changes in both the international oil market and the U.S. energy landscape warrant a thorough reexamination of the rationale, purpose, composition, and use of the U.S. SPR. The

decision about whether to reduce (or increase) the size of the SPR should be based on a prudent analysis, not driven by an imperative to fill a budget hole, no matter how meritorious the intended use.

A recent study by the Center on Global Energy Policy examined past SPR releases and what lessons could be learned about the size and management of the SPR.[26] It found that the experience of past emergency releases is, frankly, mixed. This finding is consistent with recent research by economists Lutz Kilan and Xiaoqing Zhou, who find that SPR releases have worked to bring down prices, although by less than often claimed.[27] But a lesson that comes across clearly is that in order to be effective, SPR releases should be rapid and the mix of petroleum released should be targeted to the nature of the disruption.

Moreover, any analysis of the SPR's optimal size must consider the evolving purposes of the SPR. Historically, the SPR was aimed at global oil supply disruptions, but increasingly strategic stocks, at home and abroad, may be tapped to address disruptions resulting from severe weather. In recent years, some of the most severe supply disruptions suffered by the United States have come not from abroad but from extreme weather events and their effects on the domestic upstream, midstream, and downstream oil sectors. The 2005 hurricane season, with its crippling impact on U.S. Gulf of Mexico crude oil production and, more importantly, on the Gulf Coast refining and pipeline system, is a case in point.

Climate science is clear that the incidence of extreme weather events will increase due to a temperature rise that causes changes in sea level and shifts in ocean currents and wind patterns.[28]

Recent SPR reviews have focused on the need for the DOE to conduct analysis to determine the optimal size of the SPR.[29] In our study, we acknowledge the inherent limitations of such an exercise. Before assessing the SPR's optimal size, it is necessary to agree on what the purpose of the SPR is and what risks it is expected to protect against.

To a certain extent, the SPR is either far too big or far too small, depending on what risks the federal government is looking to insure against. The SPR need not contain 500–700 million barrels to mitigate a weather-related or other localized disruption of one to two weeks in duration. At the same time, 500–700 million barrels, even in partnership with other IEA countries, may be inadequate to replace the loss of a major oil-producing country or a blockade of the Strait of Hormuz for weeks or months. Moreover, how large the SPR should be depends on one's view about when the SPR should be used—namely, how large a disruption and how large a price spike would justify a release versus letting market forces respond on their own?

Right-sizing the SPR is thus a tricky exercise. While assessing the costs of the SPR is relatively straightforward, measuring its benefits is more difficult. The current size of the SPR is more a result of political compromise than any precise analysis. But given the changes to the global oil market and prevailing risks, in my view, the burden should be on those who wish to sell off a strategic asset the U.S. has held for nearly half a century before the U.S. commits to that course of action.

The truth is that the SPR does not lend itself easily to rigorous cost-benefit analysis and optimization. From a public policy point of view, the SPR is more akin to an insurance policy,

where a fixed payment is made to avoid a small probability of a significant loss in the future.[30] Just like with insurance, the costs of the policy are known and relatively certain, but the benefits only accrue if a loss event actually occurs. The decision of what type of insurance—if any—the United States needs against oil supply disruptions and price shocks should depend entirely on our risk tolerance and preferences as a society and will ultimately have to be a public policy decision.

Moreover, the effectiveness of the SPR depends on far more than simply its size. It needs to have the right mix of crudes and products. It needs to have the necessary infrastructure so that releases can impact the global market. And it needs to have a clearer and more analytically based usage policy. Today, policymakers—often without detailed knowledge of or experience in oil markets and without the ability to consult those with such expertise because of the market-sensitive nature of SPR deliberations—are left to evaluate whether to release the SPR without clear metrics to assess the rationale for a release. The lack of a clear analytical framework also exacerbates the risk that political considerations play an outsized influence in SPR releases.

Conclusion

Recent attacks in Saudi Arabia serve as a reminder that the SPR remains an important national security asset to protect against global supply disruptions and concomitant gasoline price spikes here at home. The stunning turnaround in U.S. oil output and import dependence helps cushion the U.S. macroeconomy against oil price spikes, but the U.S. is not energy independent. It remains connected to an integrated global oil market and thus world oil price spikes still lead to higher prices for U.S. drivers at the pump. The best way to protect the U.S. economy and consumers from inevitable oil price spikes remains to reduce how much oil we use in the first place.

SPR modernization remains a critical and neglected priority. Moreover, the continued efforts by policymakers to determine the optimal size of the SPR remain too narrow a focus, as that question cannot and should not be answered in isolation. Rather, the size, purpose, composition, and use of the SPR needs to be strategically reconsidered given the rapidly changing landscape—including a shift in the U.S. energy outlook from scarcity to abundance, the evolution of the global oil market, rising risks of oil disruption from climate-related events, and potential long-term reductions in oil demand to achieve decarbonization goals. But it would be wrong to conclude based on these trends that the SPR is no longer needed. Indeed, the SPR can serve as a helpful tool of transition and may actually be too big or too small depending on what risks it is supposed to protect against.

Appendix[31]

The circumstances that might require the use of the Strategic Petroleum Reserve are defined in the Energy Policy and Conservation Act (EPCA). Generally, there are three possible types of drawdowns envisioned in the Act:

Full drawdown: The president can order a full drawdown of the Reserve to counter a “severe energy supply interruption.” EPCA defines this as “a national energy supply shortage which

the President determines –

(A) is, or is likely to be, of significant scope and duration, and of an emergency nature;

(B) may cause major adverse impact on national safety or the national economy; and

(C) results, or is likely to result, from (i) an interruption in the supply of imported petroleum products, (ii) an interruption in the supply of domestic petroleum products, or (iii) sabotage or an act of God."

EPCA also states that a severe energy supply interruption "shall be deemed to exist if the President determines that –

(A) an emergency situation exists and there is a significant reduction in supply which is of significant scope and duration;

(B) a severe increase in the price of petroleum products has resulted from such emergency situation; and

(C) such price increase is likely to cause a major adverse impact on the national economy."

Limited drawdown: If the president finds that -

(A) a circumstance, other than those described [above] exists that constitutes, or is likely to become, a domestic or international energy supply shortage of significant scope or duration; and

(B) action taken … would assist directly and significantly in preventing or reducing the adverse impact of such shortage" then the secretary may drawdown and distribute the Strategic Petroleum Reserve, although in no case:

"(1) in excess of an aggregate of 30,000,000 barrels …

(2) for more than 60 days …

(3) if there are fewer than 500,000,000 barrels … stored in the Reserve."

Test Sale or Exchange: The secretary of energy is authorized to carry out test drawdowns and distribution of crude oil from the Reserve. If any such test drawdown includes the sale or exchange of crude oil, "then the aggregate quantity of crude oil withdrawn from the Reserve may not exceed 5,000,000 barrels during any such test drawdown or distribution."

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