

DOE MODERNIZATION: LEGISLATION TO AUTHOR-
IZE A PILOT PROJECT TO COMMERCIALIZE
THE STRATEGIC PETROLEUM RESERVE

HEARING
BEFORE THE
SUBCOMMITTEE ON ENERGY
OF THE
COMMITTEE ON ENERGY AND
COMMERCE
HOUSE OF REPRESENTATIVES
ONE HUNDRED FIFTEENTH CONGRESS
SECOND SESSION

JULY 24, 2018

Serial No. 115–156



Printed for the use of the Committee on Energy and Commerce
energycommerce.house.gov

U.S. GOVERNMENT PUBLISHING OFFICE

35–837

WASHINGTON : 2019

COMMITTEE ON ENERGY AND COMMERCE

GREG WALDEN, Oregon
Chairman

JOE BARTON, Texas <i>Vice Chairman</i>	FRANK PALLONE, JR., New Jersey <i>Ranking Member</i>
FRED UPTON, Michigan	BOBBY L. RUSH, Illinois
JOHN SHIMKUS, Illinois	ANNA G. ESHOO, California
MICHAEL C. BURGESS, Texas	ELIOT L. ENGEL, New York
MARSHA BLACKBURN, Tennessee	GENE GREEN, Texas
STEVE SCALISE, Louisiana	DIANA DEGETTE, Colorado
ROBERT E. LATTA, Ohio	MICHAEL F. DOYLE, Pennsylvania
CATHY McMORRIS RODGERS, Washington	JANICE D. SCHAKOWSKY, Illinois
GREGG HARPER, Mississippi	G.K. BUTTERFIELD, North Carolina
LEONARD LANCE, New Jersey	DORIS O. MATSUI, California
BRETT GUTHRIE, Kentucky	KATHY CASTOR, Florida
PETE OLSON, Texas	JOHN P. SARBANES, Maryland
DAVID B. McKINLEY, West Virginia	JERRY McNERNEY, California
ADAM KINZINGER, Illinois	PETER WELCH, Vermont
H. MORGAN GRIFFITH, Virginia	BEN RAY LUJAN, New Mexico
GUS M. BILIRAKIS, Florida	PAUL TONKO, New York
BILL JOHNSON, Ohio	YVETTE D. CLARKE, New York
BILLY LONG, Missouri	DAVID LOEBSACK, Iowa
LARRY BUCSHON, Indiana	KURT SCHRADER, Oregon
BILL FLORES, Texas	JOSEPH P. KENNEDY, III, Massachusetts
SUSAN W. BROOKS, Indiana	TONY CARDENAS, California
MARKWAYNE MULLIN, Oklahoma	RAUL RUIZ, California
RICHARD HUDSON, North Carolina	SCOTT H. PETERS, California
CHRIS COLLINS, New York	DEBBIE DINGELL, Michigan
KEVIN CRAMER, North Dakota	
TIM WALBERG, Michigan	
MIMI WALTERS, California	
RYAN A. COSTELLO, Pennsylvania	
EARL L. "BUDDY" CARTER, Georgia	
JEFF DUNCAN, South Carolina	

SUBCOMMITTEE ON ENERGY

FRED UPTON, Michigan
Chairman

PETE OLSON, Texas
Vice Chairman
JOE BARTON, Texas
JOHN SHIMKUS, Illinois
ROBERT E. LATTA, Ohio
GREGG HARPER, Mississippi
DAVID B. MCKINLEY, West Virginia
ADAM KINZINGER, Illinois
H. MORGAN GRIFFITH, Virginia
BILL JOHNSON, Ohio
BILLY LONG, Missouri
LARRY BUCSHON, Indiana
BILL FLORES, Texas
MARKWAYNE MULLIN, Oklahoma
RICHARD HUDSON, North Carolina
KEVIN CRAMER, North Dakota
TIM WALBERG, Michigan
JEFF DUNCAN, South Carolina
GREG WALDEN, Oregon (*ex officio*)

BOBBY L. RUSH, Illinois
Ranking Member
JERRY MCNERNEY, California
SCOTT H. PETERS, California
GENE GREEN, Texas
MICHAEL F. DOYLE, Pennsylvania
KATHY CASTOR, Florida
JOHN P. SARBANES, Maryland
PETER WELCH, Vermont
PAUL TONKO, New York
DAVID LOEBSACK, Iowa
KURT SCHRADER, Oregon
JOSEPH P. KENNEDY, III, Massachusetts
G.K. BUTTERFIELD, North Carolina
FRANK PALLONE, JR., New Jersey (*ex officio*)

CONTENTS

	Page
Hon. Fred Upton, a Representative in Congress from the State of Michigan, opening statement	1
Prepared statement	2
Hon. Bobby L. Rush, a Representative in Congress from the State of Illinois, opening statement	3
Hon. Greg Walden, a Representative in Congress from the State of Oregon, opening statement	4
Prepared statement	6
Hon. Frank Pallone, Jr., a Representative in Congress from the State of New Jersey, opening statement	6

WITNESSES

Steven Winberg, Assistant Secretary of Fossil Energy, U.S. Department of Energy	8
Prepared statement	10
Frank Rusco, Director, National Resources and Environment, Government Accountability Office	33
Prepared statement	35
Daniel M. Evans, Project Manager, Fluor Federal Petroleum Operations	50
Prepared statement	52
Kevin Book, Managing Director, Clearview Energy Partners, LLC	61
Prepared statement	63

SUBMITTED MATERIAL

GAO report	82
Center on Global Energy Policy report ¹	

¹ The information can be found at: <https://docs.house.gov/meetings/IF/IF03/20180724/108593/HHRG-115-IF03-20180724-SD013.pdf>.

DOE MODERNIZATION: LEGISLATION TO AUTHORIZE A PILOT PROJECT TO COMMERCIALIZE THE STRATEGIC PETROLEUM RESERVE

TUESDAY, JULY 24, 2018

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:15 a.m., in room 2322 Rayburn House Office Building, Hon. Fred Upton (chairman of the subcommittee) presiding.

Members present: Representatives Upton, Olson, Barton, Shimkus, Latta, McKinley, Kinzinger, Johnson, Bucshon, Flores, Hudson, Walberg, Duncan, Walden (ex officio), Rush, McNerney, Peters, Green, Doyle, Welch, Tonko, Loeb sack, Kennedy, and Pallone (ex officio).

Staff present: Samantha Bopp, Staff Assistant; Kelly Collins, Legislative Clerk, Energy/Environment; Jerry Couri, Chief Environmental Advisor; Wyatt Ellertson, Professional Staff, Energy/Environment; Margaret Tucker Fogarty, Staff Assistant; Jordan Haverly, Policy Coordinator, Environment; Mary Martin, Chief Counsel, Energy/Environment; Sarah Matthews, Press Secretary, Energy & Environment; Drew McDowell, Executive Assistant; Brandon Mooney, Deputy Chief Counsel, Energy; Brannon Rains, Staff Assistant; Mark Ratner, Policy Coordinator; Peter Spencer, Professional Staff Member, Energy; Austin Stonebraker, Press Assistant; Madeline Vey, Policy Coordinator, Digital Commerce and Consumer Protection; Hamlin Wade, Special Advisor, External Affairs; Everett Winnick, Director of Information Technology; Andy Zach, Senior Professional Staff Member, Environment; Tiffany Guarascio, Minority Deputy Staff Director and Chief Health Advisor; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; Alexander Ratner, Minority Policy Analyst; Tuley Wright, Minority Energy and Environment Policy Advisor; and C.J. Young, Minority Press Secretary.

OPENING STATEMENT OF HON. FRED UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. UPTON. I know there is a couple different subcommittee meetings today, but good morning.

Good morning. Welcome to the Energy Subcommittee for a legislative hearing on a discussion draft that authorizes DOE to conduct a pilot program to lease spare capacity in the Strategic Petroleum Reserve. I want to thank Vice Chairman Barton and Ranking Member Rush for partnering on this draft as we continue our work to modernize the Department of Energy.

The SPRO is the world's largest emergency stockpile of crude in the world. More than 40 years ago, Congress authorized the creation of the SPRO in response to the Arab oil embargo to mitigate the threat of an energy supply disruption. Back then, our domestic production was in the decline, energy costs were rising, and we were becoming increasingly reliant on imports. The oil embargo exposed our vulnerabilities and panic quickly spread. Some of us will remember those long lines at the gas pump for sure.

So let's go to today. The U.S. is, arguably, more energy secure now than ever before. We are the number one world producer of oil and gas and our imports have declined by about 70 percent since peaking in 2005. With the surge of domestic production, our private stocks of crude oil are at record levels, our pipelines are full, and our refineries are operating at near peak capacity.

So I want to thank our witnesses on both panels for appearing before us today to provide their views on this legislation. I want to thank Vice Chair Barton and Ranking Member Rush for their work on this important piece of legislation.

I look forward to working with both of them and all members of the subcommittee as we move this bill, hopefully, to the House floor in the coming months.

And I now yield to the ranking member of the subcommittee, Mr. Rush, for an opening statement.

[The prepared statement of Mr. Upton follows:]

PREPARED STATEMENT OF HON. FRED UPTON

Good morning, and welcome to the Energy Subcommittee for a legislative hearing on a discussion draft that authorizes DOE to conduct a pilot program to lease spare capacity in the Strategic Petroleum Reserve. I want to thank Vice Chairman Barton and Ranking Member Rush for partnering on this draft as we continue our work to modernize the Department of Energy.

The Strategic Petroleum Reserve is the world's largest emergency stockpile of crude oil in the world. More than 40 years ago, Congress authorized the creation of the SPR in response to the Arab Oil Embargo to mitigate the threat of an energy supply disruption. Back then, our domestic production was in decline, energy costs were rising, and we were becoming increasingly reliant on imports. The oil embargo exposed our vulnerabilities and panic quickly spread—some of us will remember those long lines at the gas pump.

Fast forward to today—the United States is arguably more energy secure now than ever before. We're the world's number one producer of oil and gas and our imports have declined by about seventy percent since peaking in 2005. With the surge of domestic production, our private stocks of crude oil are at record levels, our pipelines are full, and our refineries are operating at near peak capacity. In the very unlikely event of another embargo, the United States wouldn't be impacted in the same way.

Even with America's energy abundance, the Strategic Petroleum Reserve will remain an important energy security asset, which is why I have prioritized its modernization. This Committee led the charge to right-size the SPR and increase the funding levels to clear the maintenance backlog. Over the next 10 years, DOE will drawdown and sell approximately 300 million barrels of crude oil. Now, it's up to Congress to decide what to do with the spare capacity.

The Discussion Draft before us today authorizes DOE to lease some of the underutilized space that will become available over the next several years. Commer-

cializing the excess storage capacity through a leasing program is an innovative idea—and it could be a win-win for the federal government. At a minimum, DOE may be able to offset some of its maintenance costs and invest in new infrastructure.

It's been over 40 years since Congress created the SPR, and a lot has changed. As we work to modernize this valuable energy security asset, we should bear in mind just how far we've come since the energy crisis of the 1970's. With the right policies in place, the United States is on track to become a net energy exporter in just a few short years.

I'd like to thank our witnesses for appearing before us today to provide their views on the legislation. I also want to thank Vice Chairman Barton and Ranking Member Rush for their work on this important piece of legislation. I look forward to working with them to move it through Committee and the House floor in the coming months.

Thanks, I yield back.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I want to thank you, Mr. Chairman, for holding this important hearing this morning examining legislation to authorize a pilot project to commercialize SPRO.

As you know, Mr. Chairman, subcommittee staff from the minority and the majority side worked together on this bipartisan bill and I am pleased to co-sponsor this legislation with my good friend and colleague, Mr. Barton of Texas.

Mr. Chairman, since the inception of the SPRO, which was, as you indicated, established as a result of the oil shortages of the 1970. The energy portfolio of the United States has changed dramatically. In fact, the U.S. is expected to go from a heavy importer of foreign oil to become the global leader in oil exports by as early as next year, according to the IEA.

As a result of these shifting dynamics, Mr. Chairman, it is important for policy makers including members of this subcommittee to examine important questions including if there is still a need for the SPRO. If so, how large should it be and how should it be completed?

It is my hope, Mr. Chairman, that the pilot program outlined in this bill will help inform our decision regarding the feasibility of leasing all or part of the SPRO to the private sector or to foreign governments, even those that do not pose a national security risk.

As we will discuss today, congressionally-mandated sales of SPRO oil has provided an opportunity to potentially lease the subsequent unused space to private companies and/or foreign governments as a way to maximize taxpayers' return on investment.

Mr. Chairman, I am also pleased that we have with us today representatives from both the Department of Energy and the GAO, among other witnesses, as both agencies have issued reports to help guide our decision making on matters regarding the SPRO.

Unfortunately, Mr. Chairman, there appears to be some discretion between the two agencies over the final recommendations that GAO made in its May report entitled "Strategic Petroleum Reserve: DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile."

First, Mr. Chairman, DOE appears to concur with the GAO's recommendation to supplement its 2016 review by conducting additional analysis regarding the objective and purpose of the SPRO,

taking into account additional factors such as market projections and private sector response.

DOE also agreed with the GAO's recommendation to periodically reexamine the size of the SPRO with analysis looking at the cost and benefits of the SPRO for a variety of different sizes.

DOE also appears to concur with the GAO's findings as the agency considers options for the long-term continuation of the SPRO after the impact of congressionally-mandated sales of SPRO oil are taken into account.

Mr. UPTON. That's not my wife either.

[Laughter.]

Mr. RUSH. Maybe it's my new wife.

Mr. UPTON. Your new wife. Yes, sir.

[Laughter.]

Mr. UPTON. Better answer it.

Mr. RUSH. Yes.

Mr. UPTON. You want to keep being married another 60 years.

Mr. RUSH. All right, Mr. Chairman.

Hold on, dear.

[Laughter.]

Based on the testimony, it appears that some of these recommendations will be included as a part of GAO's small post-sale configuration study expected to be completed in October of this year.

Mr. Chairman, the largest area of disagreement appears to be over GAO's recommendation that DOE—Department of Energy—conduct a cost benefit analysis of establishing regional product reserves around the country at areas that have been identified as vulnerable to fuel supply disruption.

Mr. Chairman, I hope that we can get to the bottom of this and I look forward to the testimony provided by our witnesses today.

And finally, I want to tell our witnesses that we appreciate them appearing before us today.

Thank you, Mr. Chairman. I yield back.

Mr. UPTON. The gentleman yields back.

The chair will recognize the chairman of the full committee from the good state of Oregon, Mr. Walden, for an opening statement.

OPENING STATEMENT OF HON. GREG WALDEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON

Mr. WALDEN. Thank you, Mr. Chairman.

Over the course of the past year, the Energy and Commerce Committee has been hard at work identifying what's necessary to modernize the Department of Energy's national and energy security functions.

The urgency of our focus has been driven by domestic and international challenges that will be confronting the nation in the decades ahead. These challenges, which range from maintaining our nuclear security to protecting the reliable supply and delivery of energy, require a Department of Energy that has appropriate organization, management focus, and authorities to succeed in its missions.

In recent months, the committee has moved legislation that will establish enduring leadership within the DOE for addressing all

energy emergencies, including cybersecurity threats. It has moved legislation that will ensure there is sufficient coordination for secure and reliable delivery of fuels we rely upon for our energy needs, including bulk electric power.

And just over the past few weeks, we moved legislation that will strengthen DOE's support for next-generation nuclear energy. We've also moved reforms that streamline DOE's cumbersome regulatory approval process for foreign nuclear commerce, which has inhibited American businesses from competing effectively in global nuclear energy markets.

So with today's draft legislation that Vice Chairman Barton and Ranking Member Rush have put together offers a similar forward-looking path—this one, toward ensuring the Nation's Strategic Petroleum Reserve, managed by DOE, will be more capable of responding to oil supply emergencies for decades to come.

Congress, under this committee's leadership, established the SPRO in the wake of the 1973–1974 Arab oil embargo. That incident and the gasoline shortages and price spikes of ensuing years really underscored the growing vulnerability of the United States to international oil supply shocks, especially as reliance on imported oil was rapidly increasing.

Well, times have changed, of course, and dramatically. The resurgence in American oil and gas production over the past decade has placed the United States into a dominant role when it comes to global oil and gas supplies and has begun to shift how we should view our SPRO assets.

While the role of the SPRO may be shifting, it remains important for energy security. It will continue to help us meet our treaty-level obligations to international partners in the event of major supply disruptions. It will also help maintain our international energy diplomacy, inhibiting adversaries from attempting to use oil as an economic weapon, which ultimately benefits our own and our allies' energy security.

Yet, we know that SPRO facilities require considerable upgrades to be responsive when called upon, and as Congress has mandated sales of some 290 million barrels, there is risk that without serious reforms much of the reserves' capacity to serve as a strategic stockpile will degrade further as those stocks decline.

So against this backdrop arrives the draft legislation, which offers an innovative way to accelerate reforms to the SPRO by leasing underutilized space created as the reserve is drawn down over the next decade.

A successful leasing program would attract investment into improving facilities' operations that would be responsive to commercial needs. This in turn would enable more responsive use of Federal oil stocks during those emergencies and by preserving the existing capacity of the reserve's caverns, the pilot program also ensures this asset will remain available for DOE's security missions well into the future.

So I appreciate the testimony of those who are testifying today and we will continue to work on this legislation. I don't know if anybody else wants the balance of my time.

But if not, I will yield back.

[The prepared statement of Mr. Walden follows:]

PREPARED STATEMENT OF HON. GREG WALDEN

Over the course of the past year, the Energy and Commerce Committee has been hard at work identifying what is necessary to modernize the Department of Energy's national and energy security functions.

The urgency of our focus has been driven by domestic and international challenges that will be confronting the nation in the decades ahead. These challenges—which range from maintaining our nuclear security to protecting the reliable supply and delivery of energy—require a DOE that has the appropriate organization, management focus, and authorities to succeed in its missions.

In recent months, the committee has moved legislation that will establish enduring leadership within the DOE for addressing all energy emergencies, including cybersecurity threats. It has moved legislation that will ensure there is sufficient coordination for secure and reliable delivery of the fuels we rely upon for our energy needs, including bulk electric power.

And just over the past few weeks, we moved legislation that will strengthen DOE's support for next generation nuclear energy. We've also moved reforms that streamline DOE's cumbersome regulatory approval process for foreign nuclear commerce, which has inhibited American businesses from competing effectively in global nuclear markets.

Today's draft legislation that Vice Chairman Barton and Ranking Member Rush have put together offers a similar forward-looking path—this one toward ensuring the Nation's Strategic Petroleum Reserve, managed by DOE, will be more capable of responding to oil supply emergencies for decades to come. Congress, under this committee's leadership, established the SPR in the wake of 1973–1974 Arab oil embargo. That incident and the gasoline shortages and price spikes of ensuing years underscored the growing vulnerability of the United States to international oil supply shocks, especially as reliance on imported oil was rapidly increasing.

Times have changed, of course—and dramatically. The resurgence in American oil and gas production over the past decade has placed the United States into a dominant role when it comes to global oil and gas supplies—and has begun to shift how we should view our SPR assets.

While the role of the SPR may be shifting, it remains important for energy security. It will continue to help us meet our treaty-level obligations to international partners in the event of major supply disruptions. It will also help maintain our international energy diplomacy—inhibiting adversaries from attempting to use oil as an economic weapon, which ultimately benefits our own and our allies' energy security.

Yet we know that SPR facilities require considerable upgrades to be responsive when called upon. And as Congress has mandated sales of some 290 million barrels, there is risk that without serious reforms much of the reserves' capacity to serve as a strategic stockpile will degrade further as its stocks decline.

Against this backdrop, this draft legislation offers an innovative way to accelerate reforms to the SPR, by leasing underutilized space created as the reserve is drawn down over the next decade.

A successful leasing program would attract investment into improving facility operations to be responsive to commercial needs. This in turn would enable more responsive use of federal oil stocks during emergencies. By preserving the existing capacity of the reserve's caverns, the pilot program also ensures this asset will remain available for DOE's security missions well into the future.

I look forward to the expert testimony from DOE and others this morning, and to continue work on the legislative details going forward.

Mr. UPTON. The gentleman yields back.

The chair would recognize the ranking member of the full committee, Mr. Pallone, for an opening statement.

OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. PALLONE. Thank you, Mr. Chairman.

Today we will be discussing bipartisan draft legislation on the future of the Strategic Petroleum Reserve. In December 2016, then Chairman Upton and I wrote the Government Accountability Office

requesting that GAO review the Strategic Petroleum Reserve as it is currently configured.

We asked whether there might be more cost-effective options for protecting against supply shocks and for meeting our international obligations.

Most other countries have used contracts with private companies to address these matters. So it's fair to ask whether there might be more efficient and effective ways for us to address our energy security needs in this area.

There were a number of reasons why I thought this request of GAO was particularly important in 2016. First, former Energy Secretary Moniz had laid out one vision for modernization of the SPR in the Quadrennial Energy Review that the Obama administration released in 2015. As part of that vision, Secretary Moniz suggested the establishment of more regional refined product reserves, like the Northeast home heating oil and gasoline supply reserves.

Second, at the end of 2015, Congress lifted the 40-year-old ban on crude oil exports and this was done at a time when we were seeing a radical alteration of the transportation fuels landscape. Supply was increasing, demand was decreasing, and we were seeing a rise in electric vehicles.

Third, beginning in 2015, Congress had turned to the SPR repeatedly as an offset for deficits, highways, and other items. In fact, it has been used far more in recent years for those purposes than for energy security. And recently, the Trump administration has even been sending signals that it's seriously considering releasing oil from the reserve for the express purpose of lowering gas prices, in my opinion to help Republicans heading into the midterm elections. When you get to the point where an administration is publicly discussing using the SPR for blatantly political purposes, then it is certainly a good time to discuss the future of the reserve. And this discussion is also timely now since we are already requiring the sale of so much oil for nonenergy reasons, which will free up a great deal of physical space in the reserve.

We need to consider ways to ensure taxpayers continue to receive value for the salt dome storage caverns and associated facilities that comprise the crude reserve if they are not being used to store oil.

The draft legislation that Vice Chairman Barton and Ranking Member Rush are championing is an important first step in realizing that goal. The draft bill would facilitate the leasing of unused storage space in the reserve while attempting to ensure that government and taxpayers benefit from those leases, and that's important no matter what the future has in store.

If we elect to keep the SPR in its current form, the Energy Department will need to repair and upgrade facilities to keep them useful and if we elect to create regional reserves either in addition to or in place of the SPR, we will still need to fund those regional reserves, and this bill will help bring in the revenue we need to do that.

There are still questions that need to be answered about this proposal. I want to make sure that the taxpayers see meaningful return on the investment that we made in the SPR and I want to ensure that the government isn't left holding the bag for environ-

mental liability costs while private industry gets all the benefits of the leasing arrangement.

So as long as we can get assurances on these two key points, I think moving forward with this pilot project makes a lot of sense.

And unless someone else wants the time, I'll yield back, Mr. Chairman.

Mr. UPTON. The gentleman yields back. Thank you.

We are joined, again, by two panels. We will start with Steven Winberg, Assistant Secretary of Fossil Energy from the Department of Energy. We welcome you here.

We appreciate you submitting your testimony in advance and if you wouldn't mind taking no more than 5 minutes to summarize that, at which point we will go into questions, that would be terrific.

The time is yours. Thank you.

STATEMENT OF STEVEN WINBERG, ASSISTANT SECRETARY OF FOSSIL ENERGY, U.S. DEPARTMENT OF ENERGY

Mr. WINBERG. Thank you, Chairman Upton, Ranking Member Rush, and distinguished members of this committee. It's my pleasure to appear before you to discuss the Department of Energy's Strategic Petroleum Reserve and the related use of underutilized SPRO facilities resulting from congressionally-legislated crude oil sales.

The mission of the SPRO, as has been discussed, is to protect the United States' economy from severe petroleum supply interruptions and to carry out U.S. obligations under the international energy program.

As a member of the International Energy Agency, the United States has two primary objectives. First, as a net importer, the United States must maintain crude oil and/or refined product inventories whether held by industry or government equal to at least 90 days of net petroleum imports. As of June 30th of this year, the United States held about twice that amount.

Second, the United States must be able to contribute a proportionate share of an IEA collective action response based on its share of IEA oil consumption, which is currently at 41.4 percent. The U.S. government relies on use of SPRO to meet this requirement, although commercial stocks may also contribute, albeit voluntarily.

In the event of an international oil supply disruption large enough for the President to authorize the release of the SPRO, U.S. crude oil production alone would not be able to ramp up quickly enough to make up for the lost barrels in a crisis. The SPRO can be ready to deliver crude oil within 13 days of a presidential finding while domestic production would take months to substantially expand.

Turning to the proposed legislation, it is expected that the SPRO will have approximately 300 million barrels of unused storage capacity by the end of fiscal year 2027 or, roughly, 45 percent of the current design capacity. To that end, DOE is currently conducting the SPRO post-sale configuration study that will recommend the configuration of the SPRO post-2027. This study should be completed within the next 6 months and understanding the best con-

figuration for the SPRO will guide us as we continue to sell barrels over the next several years.

It will also guide us in identifying the SPRO storage caverns or related facilities likely to become underutilized or operationally inefficient, therefore, informing possible decisions concerning site decommissioning. Further, determining the optimum configuration for the SPRO to meet domestic needs will be critical in developing and executing this proposed pilot program.

The department is supportive of maximizing the value of this taxpayer-funded asset and there are a number of issues that need to be considered related to the configuration of the SPRO post-2027. Therefore, we believe it is premature to comment on the operational feasibility of commercially leasing underutilized storage. But I can discuss with you some of the challenges. Further, it is important for both Congress and the department to consider the impact of using government facilities to compete with commercially available petroleum storage capacity.

Finally, we need to review the logistical and infrastructure challenges associated with the likely commercial requirement for increased inflow and outflow activities. Accommodating this requirement may require large up-front capital expenditures to enable commercial leasing.

I would also like to take this opportunity to discuss the recently released GAO report titled "Strategic Petroleum Reserve." I would like to focus on the one recommendation the department did not concur with. Specifically, we did not concur with the recommendation to conduct or complete studies on regional refined product reserves.

It's important to understand that while hurricanes and other natural disasters may create severe short-term logistical constraints for gasoline supplies that therefore impact gasoline prices, these constraints and price increases are quickly overcome when a hurricane passes.

This was evidenced by Hurricane Irma in 2017. Even if more gasoline was available in Florida during Hurricane Irma, there would not have been enough trucks or other transportation infrastructure to get the supplies to the retail gasoline stations where they were needed due to, first, increased evacuation traffic and then, later, flooded roads.

So given the cost of above-ground gasoline storage, it would be inappropriate to use taxpayer funds to conduct any additional studies on the use of federally-owned storage of refined petroleum products.

While there is certainly more information about the SPRO that I could discuss, I will refer the committee to my written testimony submitted to the record.

Mr. Chairman and members of the committee, this completes my prepared statement and I am happy to answer any questions.

Thank you.

[The prepared statement of Mr. Winberg follows:]

**Statement by Steven E. Winberg
Assistant Secretary for Fossil Energy
U.S. Department of Energy**

**Before the
U.S. House Committee on Energy and Commerce
Energy Subcommittee**

July 24, 2018

Thank you Chairman Upton, Ranking Member Rush, and distinguished Members of the Committee. I appreciate the opportunity to be here today and it is my pleasure to appear before you to discuss the Department of Energy's (DOE's) Strategic Petroleum Reserve (SPR) and the related use of underutilized SPR facilities as inventory is reduced over the next several years following congressionally-legislated crude oil sales.

SPR Background

The mission of the SPR is to protect the United States economy from severe petroleum supply interruptions through the acquisition, storage, distribution, and management of emergency petroleum stocks, and to carry out U.S. obligations under the International Energy Program (IEP), which established the International Energy Agency (IEA).

The SPR, established as part of the Energy Policy and Conservation Act (EPCA) in December 1975, remains a key national energy security asset, even as the nature of energy security evolves. Today's increased domestic oil production and reduced U.S. oil import dependency have changed the U.S. energy landscape.

Since the establishment of the SPR in 1975, U.S. and global oil markets have changed the environment in which the SPR operates. When the SPR was established, U.S. oil production was in decline and the spot market for oil, which provides a global pricing mechanism, was in its infancy. Since then, U.S. oil production has increased dramatically in recent years with the U.S. expected to lead the world in oil exports by next year, according to the IEA.

As a member of the IEA, the United States has two primary obligations:

1. As a net oil importer, the United States must maintain crude oil and/or refined product stock inventories, whether held by industry or government, equal to at least 90 days of net petroleum imports. Of the 30 IEA member countries, 26 other net importers have the same obligation. The remaining three members do not have a stockholding obligation because they are net oil exporters. As of June 30, 2018, the United States held 177 days

of net petroleum imports, based on a SPR crude oil inventory of 660.0 million barrels and 2017 net imports of 3.732 million barrels.

2. The United States must be able to contribute a proportionate share to an IEA collective action response based on its share of IEA oil consumption. This obligation can be met by any measure a member nation may choose, including release of strategic or commercial stocks. As of March 31, 2018, the United States must be prepared to contribute 41.4% of the barrels released in an IEA collective action response. The United States government relies on the use of the SPR to meet this requirement, although commercial stocks may also contribute, albeit voluntarily.

In the event of an international oil supply disruption large enough for the President to authorize a release of the SPR, U.S. domestic conventional and unconventional production alone would not be able to ramp up quickly enough to make up for the lost barrels in a crisis. The SPR can be ready to drawdown and deliver crude oil within thirteen days of a Presidential Finding, while domestic production would take months to substantially expand.

Use of Underutilized SPR Storage Facilities

With a total volume of nearly 290 million barrels being sold through the combination of congressionally-mandated and appropriated sales, it is expected that the SPR will have unused storage capacity by the end of FY 2027 of roughly 45 percent of current design capacity. Therefore, DOE is currently conducting the “U.S. SPR Post-Sale Configuration Study” that will recommend the configuration of the SPR at the end of the mandatory sales. This will help guide us in determining which sites and in what order we should sell crude oil from over the next several years, and identify a number of questions that will need to be addressed. For example, with the reduction of nearly 290 million barrels in SPR inventory levels, should we retain the same number of sites? Are there current storage caverns with structural issues substantial enough to raise questions about the long-term viability of operating them once current fill is removed? Should SPR retain the current mix of sweet and sour crude oil (about 40 percent sweet and 60 percent sour) at the end of all of the sales? Understanding the best configuration for the SPR will guide us as we continue to sell barrels over the next several years. It will also guide us in identifying which SPR storage caverns or related facilities likely will become underutilized or operationally inefficient, informing possible decisions concerning site decommissions. In every aspect of determining the optimal configuration for the SPR, answering these and other questions will be critical in shaping the details in executing the pilot program proposed in this legislation.

DOE intends to have an external panel of experts review the methodology for the U.S. SPR Post-Sale Configuration Study and present the information to other relevant offices within DOE to make a recommendation to myself. This process will ensure that this study becomes a critical part of our planning and implementation for the proposed pilot program.

We are supportive of maximizing the value of this taxpayer-funded asset but there are a number of issues that need to be considered related to the configuration of the SPR a decade from now, so we believe it is premature to comment on the operational feasibility of commercially leasing underutilized storage. Further, it is important for both Congress and the Department to consider the economic impact of using government facilities to compete on the private market with both existing and planned petroleum storage along the Gulf Coast. For example, as of March 2018 refinery, tank, and underground net available storage capacity within the Petroleum Administration for Defense District 3 (Gulf Coast) stood at 49 percent, suggesting readily available, privately-owned existing storage capacity. Finally, it would be important to review the logistical and infrastructure challenges associated with a potential significant increase in inflow/outflow activities across SPR sites, as in some instances existing infrastructure may not be configured to accommodate activity associated with commercial leasing, thereby limiting revenue-generating opportunities and requiring large upfront capital expenditures to enable leasing.

The General Accountability Office (GAO) Audit on the SPR

I would like to take this opportunity to discuss the recently released GAO report titled: *STRATEGIC PETROLEUM RESERVE: DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile*. The GAO made the following four recommendations to the Secretary of Energy in the report.

1. Supplement the agency's 2016 Long-Term Strategic Review by conducting an additional analysis that takes into account private-sector response, oil market projections, and costs and benefits of a wide range of different SPR sizes.
2. Take action to ensure that the agency periodically reexamines the size of the SPR.
3. Conduct or complete studies on the cost and benefits of regional petroleum and consider a full range of operations for handling potentially excess assets and, if needed, request congressional authority for the disposition of these assets.
4. Consider a full range of options for handling potentially excess assets and, if needed, request congressional authority for the disposition of these assets.

The Department's formal response concurred with Recommendation #2 (to conduct regular reviews of the SPR program every 5 years) and Recommendation #4 (to consider a full range of options for handling potential excess assets following the completion of congressionally mandated sales). The Department partially concurred with Recommendation #1 and did not concur with Recommendation #3.

Regarding Recommendation #1, I want to share briefly with you about our future plans in determining an optimal SPR size. We are looking to "flip the script" by analyzing future requirements of the SPR rather than analyzing the benefits of various SPR sizes. DOE is

proposing to determine what requirements the SPR needs to meet, then to let those requirements dictate the SPR's size. For example, should the SPR meet the needs of the United States in fulfilling its share of an IEA collective action for all oil supply disruption sizes, or should it meet some predefined subset of possible oil supply disruption sizes? With the congressionally-legislated sales, is there an opportunity to lease SPR storage space to commercial customers or to other countries that are part of the IEA collective action, which is the subject of today's hearing? Once it is determined what size, type, and number of disruptions the SPR should meet in terms of an IEA collective action and the United States' obligation and whether there is an alternative use of the SPR storage space, then we can analyze the most suitable options for SPR. This analysis, in turn, will produce the facts necessary to determine the future optimal size of the SPR.

Status Update of the SPR Modernization Program

I would like to take this opportunity to update the Committee on the Status of the SPR Modernization program, which is being funded through crude oil sales authorized under Section 404 of the Bipartisan Budget Act of 2015 (Public Law 114-74). The Life Extension 2 Program, the capital program to improve the condition of the existing SPR facilities, has received approval for the Analysis of Alternatives through the DOE Acquisition of Capital Assets process. The project planning, scheduling, and development of an Earned Value Management System are all well under way. An Architect Engineer has been selected, and design for the project is currently at the 30 percent stage; contingency planning for the impact of mandated oil sales on Life Extension 2 tasks has been completed; and the Marine Terminal Enhancement Project has been officially removed from the Modernization Program moving forward.

Recent SPR Accomplishments and Audits

Last but not least, I would like to take this opportunity to inform the Committee about a number of accomplishments by the SPR in recent years. In its history, the SPR has conducted a total of 23 combined oil sales and exchanges (including congressionally mandated sales) for a total of 206.1 million barrels. The SPR has sent \$102.7 million in revenue to the Treasury from leases of underutilized assets since 1996 including \$1.14 million in the quarter ending March 2018 alone. The SPR has avoided a total of \$419.9 million dollars of operations and maintenance costs from leasing these assets to commercial industry since 1996. The SPR has acquired 10.5 million barrels of oil in interest payments at no cost to the taxpayer through the management of returned exchange barrels and other similar programs.

I am pleased to report that the safety program, while a severe problem in the past, has shown tremendous improvement over the last few years. For example:

- The SPR Total Recordable Case Rate for calendar year 2018 is currently at 1.44, a fraction of the comparable industry rate of 4.80. From 2013 to 2017, the rate has ranged from 0.45 to 1.36, again well below the industry standard.

- The Days Away Restricted Time rate for 2018 is currently at 0.0, well below the comparable industry rate of 3.90. From 2013 to 2017, the rate has ranged from 0.0 to 0.23, again well below the industry standard.
- In 2017, the SPR received four safety awards from the Occupational Safety and Health Administration's (OSHA) Voluntary Protection Program (VPP) Region VI. The Big Hill, Bryan Mound, and West Hackberry sites each received a Star of Excellence award, and the Bayou Choctaw site was recognized as a "Star Among Stars." A Star of Excellence award requires the site to have an incident rate at least 90 percent below the national average, and the "Star Among Stars" distinction recognizes Region VI sites that have incident rates at least 50 percent below the national average.

Finally, since 2015, the SPR has undergone a total of 18 Inspector General or GAO audits, which highlights the high level of external oversight on the SPR program. These audits help to ensure that the SPR program meets high levels of performance across a range of values – including financial, programmatic, environmental, and safety – just as taxpayers expect from Government programs.

Mr. Chairman, and members of the Committee, this completes my prepared statement. I would be happy to answer any questions you may have at this time.

Mr. UPTON. Well, thank you very much for coming up this morning. I have a couple of questions.

My first couple relate to the GAO study that I know that you're familiar with. It was published in May, 2 months ago. On Page 27, it talks about the DOE could close at least one SPRO site based on the analysis by CBO of projected excess storage capacity.

For example, if DOE were to close the smallest SPRO site—Bayou Choctaw—the agency could also explore selling the connected pipeline and marine terminal, which is currently being leased to a private company.

The DOE could consider leasing excess storage capacity to other countries so that they could store oil at SPRO. DOE has not entered into any such leases with other countries. It has not considered such leases because, according to DOE, the SPRO has historically lacked capacity to store additional oil.

DOE has not proposed any of these options or explored the revenue the agency could generate by selling or leasing these assets. According to DOE officials, the agency would examine the feasibility of such options in the ongoing SPRO pool sale configuration study.

Does that sound like a potential that DOE would support?

Mr. WINBERG. Yes. Yes, we would. The first requirement we have under SPRO is to make sure that we are meeting our domestic requirements as well as our IEA requirements.

And so, based on the math and reducing the SPRO by some 300 million barrels, I think it's quite possible that we may end up deciding we can close one of the sites. Which site? We don't know yet, and that's the purpose of the SPRO post-sale configuration study. Completing that study they then will inform us on which caverns we need to keep open, which facilities we need to keep open, so that we can meet those requirements.

Not all caverns are alike, and so various of our caverns can discharge oil at faster rates. And so we need to do that study so that we clearly understand what our options are and then also, sir, our options with respect to using these facilities in a commercial nature.

Mr. UPTON. Now, as you know, we have the author of the EPCA bill—Mr. Barton—down at the end of the dais here.

Officials said that under EPCA—the Energy Policy and Conservation Act—it gave DOE authority to lease underutilized storage to other countries but not to the private sector.

DOE doesn't currently have the authority to pursue that, according to the agency officials. What is the department's view on making that change to allow the DOE the authority to sell to the private sector as well? Are they supportive of that? Would they—

Mr. WINBERG. Yes. Yes, we are supportive. But if I might, there are some technical challenges with doing that. So let me start off with other IEA member companies that also have a reserve requirement. That would be generally for long-term storage. We wouldn't expect to be moving that product in and out of the caverns. In a commercial situation, that may not be the case and the commercial suppliers of oil use the storage and then discharge and then want to inject and discharge.

So there is a cycling mechanism, and the challenge with this particular geography or geology is that these were soft caverns and the way we discharge oil out of these caverns is we inject freshwater and that starts to erode the walls of the cavern in the lower part of the cavern. And so if you do that numerous times, you may affect the integrity of the salt cavern.

So what we would need to do to go to a commercial operation where we are going to inject and discharge on a very regular basis we would have to go with what we call a brine drive system, meaning we would use saturated brine water and we'd have to store that and then inject that down into the caverns so that we weren't dissolving the walls of the cavern, and we have not yet come up with a cost for doing that.

But we know that it is not going to be inexpensive and that's part of the post-sale configuration studies to begin to look at those costs.

Mr. UPTON. Great. Thank you. My time has expired.

Mr. Rush.

Mr. RUSH. Assistant Secretary Winberg, will the DOE's SPRO post-sale configuration study, which will be released in October, examine issues that would help to determine a future optimal size of the SPRO.

Will that study make recommendations regarding opportunity to release SPRO storage space to the private sector or to other countries that are now a part of the IEA's collective action? And if not, when can we expect information from DOE on those specific topics of interest?

Mr. WINBERG. The post-sale configuration study, sir, will indeed address the optimal size for the SPRO to meet U.S. needs and also our IEA requirements.

It will help inform us on what caverns we might be able to use for leasing purposes. As I mentioned earlier, if we are going to lease those caverns to other IEA member countries, it's considerably easier in terms of the mechanics of utilizing that storage.

The post-configuration study will not be able to give us complete guidance on what we might be able to do in terms of leasing to the commercial sector. That's going to take some more work beyond the configuration study.

And what I would propose we could and should do for the commercial market is to send out a request for information—an RFI—and we'd be looking for two, maybe three, basic bits of information: Number one, does the commercial marketplace value this asset; number two, in what manner would they like to use the asset, meaning would they want to inject oil and then extract oil on a very frequent basis because then that will help inform us on what upgrades we need to make; and then number three, how does the private sector view the Federal Government stepping into oil storage leasing business, which has been the domain of the private sector for many, many years.

And so those are the three pieces of information that we would want to glean from this RFI. With that information, I think that would help inform us on what type of a leasing program we would want to develop, whether we would want to have the entity leasing the facility to make the investment necessary so that they can in-

ject and extract or whether we make that investment, which would take appropriations, and then factor that into the cost of the lease.

So a lot of moving parts there.

Mr. RUSH. All right. I am going to move on to another area.

Can you briefly discuss the disagreement between GAO and DOE regarding the recommendation that the department conduct a cost-benefit analysis for establishing regional product reserves in areas around the country that may be vulnerable to fuel supply disruptions.

Why does DOE disagree with this recommendation and is this disagreement only due to funding issues?

Mr. WINBERG. It's in part due to the cost but it's in part due to the viability of refined petroleum reserves—gasoline storage.

So let me start with the logistics, and I talked about this in my testimony a little bit. Having regional or even state gasoline storage reserves above ground doesn't necessarily solve the problem because you need to get that stored gasoline to the retail outlets—the gasoline stations.

The problem is when you're in an evacuation situation along the coast—Florida, I think, is probably a good example of what happened during the Hurricane Irma—you couldn't get the gasoline from the storage to the retail outlets because the roads were being used for evacuation.

Right after the hurricane passed through then the roads were flooded and so having that storage wouldn't have done Florida much good at all—perhaps none at all.

And so we'd be incurring quite a cost in order to maintain regional or state gas reserves around the country. We spend about somewhere between \$10 and \$30 million per year on the Northeast gasoline supply reserve.

It currently has about a million barrels of gasoline. And so multiply that by whatever number a regional refined petroleum facilities we might contemplate.

The costs get pretty expensive pretty quickly and we may not be able to use it because of the logistics of getting it to the retail stations.

Mr. UPTON. Thank you. The gentleman yields back.

Mr. Barton.

Mr. BARTON. Thank you, Mr. Chairman and Ranking Member Rush for scheduling this hearing. I'd like to make a few comments and then I have a few questions.

First, I want to thank Congressman Rush for working with me as one of the two lead bipartisan sponsors. Legislation, I think, always is better if it is bipartisan and certainly we, on the majority side, want to make every effort to make this bipartisan.

I was very heartened by the opening comments of Mr. Rush and Mr. Pallone. I think we have got a chance to help the country if this draft becomes, in fact, a bill and is passed. It doesn't change the basic mission statement. It doesn't change the authorized level of the Strategic Petroleum Reserve. It doesn't change the presidential authority. What it does do is add to the mission statement. It gives the secretary of energy the authority so long as it doesn't impact the basic existing mission statement the ability to lease and

utilize underutilized capacity of the existing SPR to the private sector for storage and, hopefully, utilization of crude oil.

I think that's an important point, that we are not trying to change the basic statement that became law in the 1970s. We are just trying to adopt the SPR to the modern situation.

A couple of questions for our friend from DOE. What is the authorized capacity currently of the SPR in terms of millions of barrels?

Mr. WINBERG. The design capacity is 712 million barrels. In 2018 right now we have 660 million barrels and in 2027 we will be down to 405.

Mr. BARTON. What did Congress authorize the capacity to go up to? I thought we were about 900 million barrels. Is that not true?

Well, I can find out. I just thought you might know.

Mr. WINBERG. I'll get back to you on that.

Mr. BARTON. OK. Whatever the authorized capacity is, if I understand you correctly, the existing physical capacity is a little over 700 million barrels. Is that correct?

Mr. WINBERG. Yes, sir.

Mr. BARTON. And of that, how much oil is actually stored right now?

Mr. WINBERG. We have 660 million barrels stored right now.

Mr. BARTON. OK. So we are not quite at 100 percent of existing physical capacity?

Mr. WINBERG. That's correct.

Mr. BARTON. OK.

If this draft legislation becomes law, whatever the authorized capacity is—and let's assume that it is 900 million because I think that's right—under this pilot program would it authorize the secretary of energy if it meets all the other requirements under the draft legislation to actually add capacity to the SPR so long as it doesn't go above the authorized level?

Mr. WINBERG. In order to add capacity above the 712, it would take some additional capital investment in the facility to get—

Mr. BARTON. But there is nothing in the law that would prevent going above what's physically available today. Is that not correct?

Mr. WINBERG. I believe that's correct.

Mr. BARTON. OK. I have one more question. I think I'll yield back.

One final comment—we don't claim—Mr. Rush and I—that this draft is perfect. If we go through the hearing and there are things that we need to change, I think I speak for everybody on the majority side that we are very open.

But I also think I speak for the majority and the minority that we hope that this is something that can move reasonably expeditiously and that means actually end up in a bill the President signs in this Congress.

And with that, Mr. Chairman, thank you for your leadership and Mr. Rush's and Mr. Pallone's, and I yield back.

Mr. UPTON. The chair would just say that I am delighted that the two of you are working on this. It's something that needs to be done and we look forward to getting this to the President's desk before the year is out, if we can.

Mr. Pallone is recognized for an opening statement.

Mr. PALLONE. Thank you, Mr. Chairman.

Mr. Secretary, the idea of establishing regional refined product reserves came out of the first Quadrennial Energy Review and was strongly supported by former Secretary Moniz.

And now GAO is also saying we need to look at regional reserves, particularly in the Southeast and the West and I, too, think that regional refined product reserves needs to be a part of any SPR modernization effort.

Now, you can correct me if I am wrong. But you mentioned, I believe, that the Trump administration seems hostile to the concept. In fact, President Trump had proposed doing away with the Northeast gasoline supply reserve, which had been created administratively by President Obama in response to the dangerous shortages that occurred in the wake of Superstorm Sandy, including in my area of New Jersey. And, frankly, I think this administration's attempt to undo the Northeast reserve is reckless and that's why I introduced legislation to establish that reserve in statute.

But it seems like everybody but the Trump administration sees the benefit in establishing regional reserves and particularly one in the Southeast, where states like Florida, Georgia, South and North Carolina are extremely supply constrained, and those states are really vulnerable in the face of an extreme weather event. Yet, this administration and you, I think, said don't want to take any action on that.

So can I just ask you, Mr. Assistant Secretary, you said that the price of gasoline I think—you can correct me—goes back to normal soon after a storm like Sandy or Irma.

What is that based on? That wasn't true in New Jersey after Sandy. Did I misunderstand you? I thought that's what you said, as one of the reasons why it wasn't necessary to have these regional reserves.

Mr. WINBERG. The first point, I wouldn't characterize the administration's position as hostile against the gas reserves.

What I talked about in my testimony is, A, the cost of these gasoline reserves, and I used—

Mr. PALLONE. Yes. You said they would cost the government too much and—my understanding is you said that you were not supportive of it or the administration wasn't because the price of gasoline goes back quickly after a storm like Sandy—I think you said Irma.

And then you also said that the regional reserves would cost the government too much. I am just asking you what those two things are based upon because I am wondering—wouldn't the same argument be used against the existing SPR? Why are you saying—I don't believe it's true that the price goes up quickly right after and I don't believe that this is going to cost the government too much—certainly, less than it costs to maintain the SPR.

I am just challenging those two statements. That's all.

Mr. WINBERG. I can address the pricing issue with respect to Hurricane Irma. The prices came back down to relatively normal levels.

I can't speak to every gasoline station around Florida. But as the product moved back into the state and retail stations were opening back up again, there was competition and prices reflected that.

I think that the bigger issue is that if we set up reserves and we have these fairly sizeable storage areas and we can't get the gasoline to the retail outlets because of congested roads due to evacuation and then flooded roads, then it is an expense that's not really serving the public good.

Mr. PALLONE. But what I was arguing—see, look, I understand what you're saying in all these cases. But I just would like to know what that's based on.

In other words, my experience in Sandy which, admittedly, is only one hurricane, is that the price—it does take a while before the price goes back to normal and that I don't know why it would cost more to have these regional reserves significantly more than it does to maintain the SPR.

I am not saying we shouldn't have an SPR but I think the costs of the regional ones would actually be less. And it seems like everybody's suggesting that this is a good idea.

There is going to be some cost to the government, but I'd just like to know—if you get back to me, tell me, what's the evidence that the price goes back quickly?

Why are you saying it's going to cost so much and now you're saying that they can't bring it to the gas stations. That's not my experience.

So I just want you to get back to us and—either now or get back to us and explain what this is based on because it seems to be contrary to everything I've heard.

Mr. WINBERG. We will be happy to get back to you with some specific cost numbers on utilization.

Mr. PALLONE. All right. I'd appreciate it.

Thank you, Mr. Chairman.

Mr. UPTON. Mr. Olson.

Mr. OLSON. I thank the chair and welcome, Mr. Winberg, and please give your boss, Secretary Rick Perry, my best. It's not very good, but it's my best.

Mr. WINBERG. I will do so.

Mr. OLSON. He will know where that comes from.

The SPR is important back home in Texas-22 in southeast Texas. You mentioned the status of your modernization program. Could you please talk about the most important steps DOE can take in this next year to continue to improve the readiness of the SPR?

Mr. WINBERG. Yes, sir, I can. Thank you.

One of the steps that I mentioned already is the post-sale configuration study and then the second one is we are developing the Life Extension program.

We are in the process of pulling that together and the Life Extension program is going to allow us to continue to meet our needs under IEA, number one.

And then, number two, the Life Extension program will focus on those assets that we are going to continue to need post-2027. That's the primary role of the Life Extension program.

Mr. OLSON. The second question, sir—as you know, Texas oil production is booming. The Permian Basin itself is projected in a few years to produce more oil than every country in the world except for Saudi Arabia.

One oil plain in Texas takes over all the world except for one country—Saudi Arabia. A lot of that crude has to go to export—go to the Gulf Coast ports—goes to either Corpus Christi, Houston, Port Arthur, Beaumont—all those ports—Brownsville—goes there for refining and export.

If we pass this discussion draft before us, do you think the oil industry will view the SPR sites on the Texas Gulf Coast as a good holding site for their oil and are their needs looking more shorter term than what the SPR is designed for?

Mr. WINBERG. The answer to your first question, we are not yet sure how the commercial market is going to view this government asset—the SPRO and our ability to potentially store oil for the commercial sector.

That's part of the RFI—the request for information that we are going to send out so that we can better understand what the commercial industry needs and wants and whether the SPRO will fulfill that requirement.

So as we get that information I'll be happy to meet with the committee or meet with you individually—

Mr. OLSON. Thank you.

Mr. WINBERG. And give you the results of the study.

Mr. OLSON. Thank you.

My final question—as we had these SPR drawdowns over and over and over—June of 2011, 30 million barrels of oil; August of 2012, 1 million barrels of oil; November of 2015, 58 million barrels; December 2015, 66 million barrels; January 2017, 8 million barrels—over and over.

I am curious to hear how about the state of the SPR is with all these draw downs. Specifically, we have a lot of light crude here at home.

Are you happy about the balance between light crude and heavy crude in the SPR and the balance between sweet and sour oil? I know there is lots of people concerned especially about heavier crude with a supply disruption because of this wave of sweet crude and light crude. Any concerns about the SPR's makeup with those issues, sir?

Mr. WINBERG. Well, we are going to—I don't have any particular concerns about them. But that is part of the post-sale configuration study to evaluate sweet crude versus sour crude and what percentage we should have of both of those, given the changing dynamics of oil production here in the United States. But I don't have any particular concerns about them right now.

Mr. OLSON. My time is about to expire. I yield back. Thank you.

Mr. UPTON. Mr. McNerney.

Mr. MCNERNEY. Well, I thank the chairman for holding the hearing and I thank Mr. Barton for your work on it. I thank the witnesses for your thoughtful answers so far.

Similar to the Northeastern gasoline supply reserve, what do you think about establishing a reserve in the West for hurricane preparedness and other sorts of emergencies that we have out there, as opposed to hurricanes, which we won't have? Earthquakes.

Mr. WINBERG. I think the same issues that we have—our concerns about our ability to develop a surface reserve and then get

that product in that surface reserve to the market where it's needed or——

Mr. MCNERNEY. Well, you don't have a lot of warning for earthquakes so you don't have an evacuation problem.

Mr. WINBERG. Well——

Mr. MCNERNEY. You have some roads disrupted but, I think it's a better case to be made in the West where we could have those different sorts of emergencies.

Mr. WINBERG. That's true. But if we have an immediate earthquake situation, there is some road damage——

Mr. MCNERNEY. Right.

Mr. WINBERG [continuing]. That means that the gasoline can still move in through the normal infrastructure and transportation mechanisms that it would. There may be some that would be cut off, depending on where the earthquake——

Mr. MCNERNEY. Right.

Mr. WINBERG [continuing]. Happened and the effect of it and how many roads or rails might be damaged. But, generally, there are multiple routes into an urban area or a suburban area where there is——

Mr. MCNERNEY. So we have a pretty good case to be made for establishing the product reserves in the West?

Mr. WINBERG. I am sorry. Say that again.

Mr. MCNERNEY. We have a pretty good case to be made then for establishing those reserves in the West?

Mr. WINBERG. Well, I think if you had limited damage to road or railroad infrastructure then you'd have to look at the cost of establishing that reserve and maintaining it and whether it would provide a lot of value in this example of an earthquake situation.

Mr. MCNERNEY. OK. Changing the subject a little bit, what about the challenges with respect to the infrastructure of the existing SPRO facilities?

My understanding is that the extraction network infrastructure was aging and not in very good shape. We have the degradation of the caverns when you put in that water to push out the oil and so on.

Can you talk a little bit more about that existing infrastructure?

Mr. WINBERG. Sure, and I think there are two parts to the infrastructure. One is the subsurface and then the other is the surface.

And on our Life Extension program, that we are involved in right now, mostly that is surface infrastructure. So we are talking about pipes, pumps, and motors and that type of infrastructure. And so we have got a program in place to upgrade that because, as was mentioned earlier, the SPRO has celebrated its 40-year anniversary last year.

The subsurface infrastructure, while we have had a number of withdrawals, the caverns are generally good for about five withdrawals and then refills before you start to see a lot of degradation.

And so part of the assessment that we are looking at in the configuration study is the stability of the caverns, how much erosion——well, it's not erosion. It's really——

Mr. MCNERNEY. Well, five cycles doesn't sound like a lot if we are going to be leasing out space.

Mr. WINBERG. Well, those are the cycles given—that's what the caverns were designed for. If we leased it out under commercial operation, we might see considerably more than that because people store oil and they use it as a hedge.

The price goes up, they are going to want to withdraw, and then they are going to want to reinfect. So it could happen many, many times, which is our concern about the integrity of the caverns.

Mr. MCNERNEY. What happens to the water when you inject water to pressurize release? What happens to that excess water? Does it just get absorbed into the landscape?

Mr. WINBERG. The water stays down in the cavern and if we refill it then we would extract the water.

Mr. MCNERNEY. So it's—

Mr. WINBERG. Then we have to treat the water.

Mr. MCNERNEY. Is it better to be at 100 percent capacity or is it better to be 90 percent capacity or some lower value?

Mr. WINBERG. Operationally, it's probably always better to be somewhere in the 90 to 100 percent. But there is a cost associated with being at that capacity level. You're storing oil in a lot of facilities.

Mr. MCNERNEY. All right. I thank the chairman. I yield back.

Mr. UPTON. The gentleman yields back.

And before we move to Mr. Shimkus, Mr. Barton will have a brief announcement here.

Mr. BARTON. I have a point of personal privilege. In the back of the room, two of my granddaughters and my two daughters and their significant others are watching the hearing and, in typical millennial fashion, they are sitting on the minority side of the room.

[Laughter.]

If they would stand up and let us acknowledge their presence.

[Applause.]

Mr. UPTON. Maybe we will let Mrs. Rush give them a call as well.

[Laughter.]

Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman.

Mr. McNerney's just leaving but I wanted to follow up on some of his comments because they had raised maintenance as an issue and this was going to be my third question. But I am going to bring it up just in the timely manner that he addressed it.

The GAO reported that the SPRO had experienced at least five major equipment failures since 2013 including a major pipeline failure that shut down the Big Hill site for 5 years.

Could leasing underlie SPRO capacity help offset the cost of operations and maintenance?

Mr. WINBERG. Yes, and under two different scenarios. One, we might make the upgrades and then roll that in to the price of the lease but that would require appropriations.

Another option, of course, is to have the entity leasing the space to make those upgrades.

Mr. SHIMKUS. Yes. Based on my experience with the appropriation committees, I wouldn't encourage the first course of action. I

would think that maybe in the leasing agreement of upgrades that would be a more straightforward process. But that's me.

It was also talked about a little bit earlier in the question and answers about spare caverns and I think being able to, in essence, lease those out and there was some interest in that.

Did I understand that question and answer process? Another member mentioned about excess space in other caverns and the ability to lease that out to private entities.

Mr. WINBERG. Yes. Congressman, we have not yet tested the market, if you will, on commercial interest in leasing the space. That would be the subject of the request for information that we will be sending out.

Mr. SHIMKUS. Let me also talk about there has been some debate about the refined product reserves that are established and I think there is a cost to doing this, right? A financial cost of setting these things up.

Mr. WINBERG. Yes.

Mr. SHIMKUS. Do you know what it is for the East coast refined product?

Mr. WINBERG. Yes. We spend between \$10 and \$30 million a year for, roughly, a million barrels of gasoline.

Mr. SHIMKUS. That's per year?

Mr. WINBERG. Yes, sir.

Mr. SHIMKUS. So I think it's credible for us to have the debate of a cost benefit analysis. If we are spending \$25 million a year for \$1 million of refined product versus the timeliness of transportation and the access, I think that's where the debate is. Everybody would like to have a refined reserve available next door for disruption.

In the Midwest, we have tornadoes and things go down and power goes off. But the question is, is \$25 million for 1 million—I don't think that makes financial sense.

I wanted to raise that. The last thing I want to address is U.S. will become a net energy exporter by 2022. That's the expectation. Do you agree with that?

Mr. WINBERG. Yes, sir. I do.

Mr. SHIMKUS. Do you think there is a need for a strategic petroleum reserve? I was a big supporter of this years ago when we were worried about our enemies around the world shutting off the sea lanes because we were importing our crude oil.

But if we are a net exporter does that even lend to the question of whether we need a SPRO?

Mr. WINBERG. I think it's difficult to forecast what kind of geopolitical challenges we might have—

Mr. SHIMKUS. Well, if we listen to Olson, Texas is going to supply the whole world. So I—

Mr. WINBERG. But there is also the hurricanes and other—

Mr. SHIMKUS. And I would think that more speaks to pipelines and diversification of a refinery basis and I think that's occurring as we speak right now, too, with North Dakota and some other places where we are having that occurring.

So those are just questions I pose. It's great to have you here. We live in some exciting times. Whoever thought that we'd be exporting crude oil and exporting liquefied natural gas, and we all

know the benefits for that just for our balance and our income or the trade balance but also for our allies who, in some places around the world, are being held hostage by foreign powers who really don't like us that much.

So I appreciate it. Send my regards to the department and with that, Mr. Chairman, I yield back.

Mr. UPTON. Mr. Green.

Mr. GREEN. Thank you, Mr. Chairman. Thank you for being here.

You have a couple Texans on the committee, both Republican and one Democrat. But I have a district in east Harris County and so the salt domes that are created are there in Chambers County all the way through southeast Texas.

This Congress and previous Congresses have chosen to sell oil from the SPRO since 2015. The cumulative sale of these barrels—250 million barrels—could occur about 2027. Is that correct?

Mr. WINBERG. Yes, sir.

Mr. GREEN. OK. And leave us with the expected inventory of 410 million barrels?

Mr. WINBERG. Four hundred and five.

Mr. GREEN. Four hundred and five. OK. I know we talked about it one time. Over the years the SPRO had as much as 725 million barrels. Is that correct?

Mr. WINBERG. Yes. Well, I think the capacity is 712 million barrels.

Mr. GREEN. OK. Although the authorization or the intent was to have a billion barrels?

Mr. WINBERG. Yes, I believe that's correct.

Mr. GREEN. Back when it was created. With what's happening today in the energy market I can't imagine us—are we buying crude oil into the SPRO now?

Mr. WINBERG. No, we are not.

Mr. GREEN. OK. And because as a Texan, you want to buy it at \$30 and sell it for \$70 and so I would hope we would not be buying \$70 a barrel oil.

One of the concerns I have is that during the Hurricane Harvey that was last year, Hurricane Ike that was 2008, even Katrina, because part of the SPRO goes into southwest Louisiana, has the storage facilities been damaged because of these hurricanes?

Mr. WINBERG. I think there was some surface damage but that damage has been repaired and the SPRO is fully capable of meeting its withdrawal requirements.

Mr. GREEN. OK.

This crude oil is selling from SPRO on the open market, do you have any idea who's buying it? Because I have five refineries in east Harris County that typically uses the heavier crude still, although they are retooling now because of the lighter sweet coming.

Is it typically local refineries that are buying that or are they other countries or anything else that you know of—anyone who sells oil from the SPRO?

Mr. WINBERG. We do know who's buying the crude and I don't have the specifics here with me but I am happy to get that information to your office with respect to whether it was domestic or international purchases.

Mr. GREEN. At one time, I think people would be concerned about someone from another country that's not an ally buying our crude oil.

But since we are exporting crude oil now from everywhere I can imagine on the Gulf Coast in Texas and Louisiana, that's probably not a big issue.

Does U.S. or the DOE SPRO post-sale configuration study—has it been completed?

Mr. WINBERG. No, sir. It's underway right now. We expect we will complete it this autumn.

Mr. GREEN. OK. The SPRO is a lot of different sites in the salt dome because some of that salt dome underneath southeast Texas and Louisiana may have to be qualified or—if we wanted to get to a billion barrels, how could we do that? Is it engineeringly possible?

Mr. WINBERG. Yes. Yes, we could develop more storage capacity. If we ended up selling into the commercial market and we needed to develop the brine drive system so that we could plug the caverns and then reinject oil, we would need some additional caverns for the brine storage system.

Mr. GREEN. We are currently required to maintain a 90-day supply of crude oil and, currently, we have a supply of about 170 days. Is that correct?

Mr. WINBERG. Yes, sir. I think that's correct.

Mr. GREEN. In DOE's opinion, are the current level of reserves adequate for future potential disruptions?

Mr. WINBERG. Yes, sir.

Mr. GREEN. OK. And, again, the market has changed so much because, literally, just down the road we are seeing a lot of crude oil produced. Although, again, it's typically lighter sweet than compared to the heavier crude.

Mr. Chairman, I appreciate you having this hearing on the oversight. This is kind of in the neighborhood for those of us in southeast Texas. So we have a big interest in it.

Thank you for being here.

Mr. WINBERG. Thank you.

Mr. UPTON. Mr. McKinley.

Mr. MCKINLEY. Thank you, Mr. Chairman, and thank you for the sponsors of this legislation to consider that.

Mr. Winberg, some of your testimony has just raised more questions for me as a result. The one was your testimony—you talked about the annual cost for this—the gasoline reserve we have in the Northeast at about \$25 to \$30 million a year.

But I remember a few years ago we were having that discussion about this because it was done not by legislation but through the administration, that as one of the discussions we have to replenish that—gasoline does not have a very long shelf life.

So is it physically emptied and restored? How is the mixture so that we know the age of that gasoline there?

Mr. WINBERG. We do roll the gasoline, Congressman. I don't know specifically how many turns we do. But I can find out for you.

Mr. MCKINLEY. I am just curious because if crude is selling for \$70 a barrel but you're selling refined product at only \$30 a barrel, something's wrong with the math here. You must not be emptying it entirely and using it.

So we can have more of a conversation. I am just curious to see how that's functioning there. Also, you talked about the five—perhaps you can cycle about five uses or draw down about five times out of the salt dome.

But if we go to this process—this is what I am having a little concern with—by leasing it out to other entities and then you indicated that perhaps they might want to draw down more often than five.

Do you see a possibility that you will have them posting bonds or some kind of verifications that they pay for the repairs to the salt dome if that—other security so that someone with an outside interest could cause us to lose the integrity of our salt storage?

Mr. WINBERG. We believe we have a technical solution for the problem and that technical solution would be what we are calling the brine drive system.

So rather than injecting fresh water into the salt cavern to lift the oil, we would inject a saturated brine solution.

Mr. MCKINLEY. I'd like to know a little bit more about that. I heard you talk about some additional brine that you had put back into that. That was interesting.

How do you verify—because we got the problem with the ethane storage hub up in the Appalachian area—how do you verify the thickness of the walls of the salt dome in an existing while it's in operation.

How are you doing that so that you could make a determination maybe 5 years it could reach its life? How do you verify that?

Mr. WINBERG. That's a great—

Mr. MCKINLEY. The extent of their degradation.

Mr. WINBERG. That's a great question and, Congressman, I don't know the answer. But I will get back to you and let you know specifically what testing mechanisms we use to determine—

Mr. MCKINLEY. Just one engineer to another engineer. I am just curious how you're going to do that.

And the last is more about security. I've never really actually seen a map that showed where our salt domes are located until today. I didn't want to know where they were.

But if I know now, hostile actors can know where those salt domes are, and if they are that important to our national security why would we ever put it on a map where those things are?

Mr. WINBERG. Well, these are pretty large facilities and so people know where they are. They are very secure—

Mr. MCKINLEY. My point, again—how secure are they? At the Greenbriar we used to have a bunker there for congressmen to go hide until someone revealed where it was and then we had to do away with that.

Now we are revealing our strategic reserve is—600 million barrels of gas or crude oil. The bad actors know exactly where that is. So if we had to abandon the Greenbriar what are we doing here?

Mr. WINBERG. Well—

Mr. MCKINLEY. How secure is it?

Mr. WINBERG. Yes. We have an ongoing security program and so we are updating it, both physical security as well as cybersecurity. You know, we are opening up a new office in DOE, the CESER, which is going to address the cyber issues.

The physical security issues that—

Mr. MCKINLEY. It's not the cyber. I am talking about something a bad actor—I don't know that we have an Iron Dome outside these things. So I am just curious how we are going to protect them.

Mr. WINBERG. Well, they are fenced in. We have guards, guns, and gates.

Mr. MCKINLEY. I yield back. Thank you.

Mr. OLSON [presiding]. The gentleman yields back.

The chair notes for the record that the Greenbriar is doing just fine because this week the Houston Texans started their practice for the football season at the Greenbriar.

The chair now calls upon Dr. Bucshon for five minutes.

Mr. BUCSHON. Thank you, Mr. Chairman.

Mr. Winberg, we spend more than \$200 million per year on SPRO management and operations, yet most of the equipment is beyond its serviceable life and there is a growing backlog of deferred maintenance.

For example, GAO reported that the SPRO has experienced at least five major equipment failures since 2013, including a major pipeline failure that shut down the Big Hill site for 5 weeks.

You're talking about changing to a brine-related way to extract oil. It seems like we need to catch up on this maintenance first.

What's been the reason why there is a backlog of deferred maintenance and all the equipment is beyond its serviceable life and what can we do about it?

Mr. WINBERG. I think the backlog is because we didn't have appropriations sufficient to keep the facility in optimal operating condition. We now have our—

Mr. BUCSHON. OK. I am just going to interrupt you there for a second because I think that's the answer we get from every Federal agency any time we ask this question.

But were there requested appropriations that didn't get appropriated? Were there no appropriations or, there is more to it than that, I would imagine.

Mr. BARTON. Would the gentleman yield?

Mr. BUCSHON. I will yield.

Mr. BARTON. I don't want to speak for the Department of Energy, but the draft legislation allows, without going through the appropriation process, funds generated by using this facility for private purposes to be used for maintenance of the facility. So we have tried to solve that problem in the legislation before us.

Mr. BUCSHON. Thank you, Mr. Barton, because that's going to be one of my next questions.

So it sounds like we have probably had an appropriations issue over the years. I get that, and it seems like we need to address that.

So the question, and is a follow-up to what Mr. Barton just said, could leasing underutilized space, capacity, help offset the cost of operations and maintenance?

Mr. WINBERG. Yes, I think it could. Again, we need to query the market and find out what value they place on this storage and what they are willing to pay for it.

Mr. BUCSHON. Yes. So potentially this draft legislation could help us solve what appears to be probably a long-standing issue with

our maintenance and serviceable life of our equipment being at the end of its serviceable life if we find more money and put that into operation and maintenance.

Also, most of the time it sits idle, could some of the spare caverns—and I think you went over this and the answer is yes—be commercialized in such a way to improve its overall operational readiness?

Mr. WINBERG. Absolutely. Yes, sir.

Mr. BUCSHON. And you described some of that—I was interested in the fact that on a commercial basis you'd have to have more going in and out all the time, right? Could you isolate that to the commercial space versus the noncommercial space?

So you're not talking about the entire reserve being accessed all the time. Were you talking about a way to cordon off, so to speak, what we could utilize and in that way the caverns of the whole reserve wouldn't be at risk.

Mr. WINBERG. That's correct. We would utilize the brine drive system in those caverns where we were discharging and refilling on a frequent basis for commercial purposes.

Also, I spoke earlier about leasing some of the space to other countries that are members of the IEA activity and in that case then those countries would not be withdrawing and injecting on a routine basis, and by having that capacity our overall costs likely would go down because we would have more oil stored so you'd spread the cost out over—

Mr. BUCSHON. Right. So we would do that on a build-out basis or they would pay for it or we'd build out what they need or they'd pay for that?

Mr. WINBERG. Well, I think we would utilize the excess capacity we have and if there was a big enough market I think we could look at building out additional. But we are going to have 300 million barrels of capacity when we finish the draw down in 2027.

Mr. BUCSHON. Understood.

Thank you, Mr. Chairman. I yield back.

Mr. OLSON. Thank you.

Mr. Duncan, 5 minutes for questions, sir.

Mr. DUNCAN. Thank you, Mr. Chairman.

There is no doubt that demand for oil is much greater now than when the SPR was originally developed, and I wonder is the SPR big enough to have an impact in the case of a real crisis in the 21st century. Is it big enough?

Mr. WINBERG. I think it probably is big enough.

Mr. DUNCAN. Is it storing enough?

Mr. WINBERG. I think it is storing enough right now. As we move into 2027, we are going to be very close to meeting our IEA requirements. In fact, we—

Mr. DUNCAN. Have you all looked at the demand as it applies in the 21st century here and 2018, right, or—

Mr. WINBERG. Yes, we have. But a balancing factor for that, of course, is that we have much more domestic production and that domestic production, while it takes several months to come online, it's much quicker than it was before the unconventional oil plays became commercial in the United States.

So we are down to 4 or 5 or 6 months to get wells online as opposed to——

Mr. DUNCAN. Well, just let me ask you this. In your opinion, has SPR been used effectively over the past four decades to respond to oil price volatility?

Mr. WINBERG. I believe it has, yes.

Mr. DUNCAN. Has been used effectively? OK.

Has it been appropriately used as a tool to balance supply and demand?

Mr. WINBERG. That's not its purpose to balance——

Mr. DUNCAN. I remember the oil shortage in the 1970s and since then we really haven't had a true oil shortage. We have had price volatility, right.

So given the change in landscape, the fact that the United States is now a net exporter, do you see the SPR being able to balance the supply and demand or even necessary to balance the supply and demand when we have an abundant supply?

Mr. WINBERG. Well, the purpose of the SPRO was never to balance supply and demand but, rather, its purpose was to be there in the event that there was more of a crisis situation rather than short-term supply and demand imbalances.

And so that was its purpose. That still is its purpose, and I think where we are right now, even with the draw downs, given the fact that we have much more domestic production and that production can come on much quicker, I think that we have sufficient reserves and sufficient capacity with the SPRO.

However, getting to an earlier question, we do need to upgrade it and maintain mostly the surface facilities but also subsurface facilities to make sure that we can meet the——

Mr. DUNCAN. Let me ask your opinion about—Congress has sold off some of the SPR in order to cover deficits and when we have had some of these crises since I've been in Congress—8 years—it also seems like we always sell it for a lot less than we paid for it, and that's kind of opposite of buy low sell high, right?

That's the first thing. Who manages what price point we purchase or replenish? If you've got a high-value asset that you paid less for, do you all play the market in that regard and sell it at a higher price and buy it again at a lower price to help the American taxpayer?

Mr. WINBERG. When we have a release we do it under an auction mechanism. So we get the highest price that the market's willing to pay.

Under some releases, where we have a test sale, for example, then whoever buys that oil has to replenish that oil plus an additional amount of oil.

So in that manner, we are paying for the cost of extracting oil from the facility. But the SPRO and the operation of the SPRO does not play the market, per se. We do it through an auction mechanism.

Mr. DUNCAN. Mr. Chairman, 30 seconds I've got left.

Since I've been in Congress, we have used the SPR as an opportunity to offset spending with cut-go or whatever, and that's wrong. This is a strategic petroleum reserve to help us in the time of a

crisis and oil shortage or restriction of the flow of oil by OPEC like we saw in the late 1970s.

And I am always going to argue that this Congress and this government should not use this as a pay for. It should be used as it's designed.

But we also ought to manage it—if you've got a bulk asset that you've got a high basis on sell it—buy it low and help the American taxpayer.

With that, I yield back.

Mr. OLSON. Thank you.

Mr. Tonko, are you ready, sir? Are you ready? Five minutes for questions.

Mr. TONKO. Thank you, Mr. Chair.

Mr. Winberg, can you provide us with an update of DOE's current modernization plan and how great is the need to invest in the infrastructure in order to keep it operating effectively?

Mr. WINBERG. Yes. To answer the second part of your question, I think the need is pretty great. This facility, as we have talked about, is over 40 years old. The last major upgrade was about 25 years ago. So we have piping, pumps, and valves that need to be replaced on the surface.

So the need is pretty great. We have got a Life Extension program and we are developing that program so that, A, we can best handle the legislatively mandated sales, and then, B, the Life Extension program is being designed so that we can upgrade our systems to allow the SPRO to operate post-2027 for an additional 25 years.

Having said that, the Life Extension program on the way it's been designed has enough flexibility so that if we decide we are going to lease space to other countries or commercial leases, we have got enough flexibility in the program so that we can adjust it so that we are not using taxpayer dollars to upgrade systems that perhaps someone leasing would pay for.

Mr. TONKO. Thank you.

And do you believe there is private sector demand for SPRO capacity?

Mr. WINBERG. That's a great question, and we don't know the answer to that yet. What we are planning to do is send out a request for information, an RFI, out into the marketplace and what we want to find out is, A, is there a need for government-owned storage in the commercial market; B, how would they utilize that storage space if we leased it to them; and then, C, are there concerns or issues with the government leasing space in a market that has mostly been done by commercial entities.

Mr. TONKO. So and how would it compare to existing storage options—for example, a tank storage or—

Mr. WINBERG. Right. We don't yet know the answer to that question either. That will be informed by the RFI. Once we know how private industry might want to utilize this storage, then we can put a cost, because there will be some capital needed in order to facilitate commercial storage activities.

Mr. TONKO. And do you believe there is an opportunity to use the revenues raised by commercial leases to invest in modernization to benefit the public's use of SPRO?

Mr. WINBERG. I think there might be. But, again, we are a little bit early in the process to know that right now.

But that's certainly the hope, and I think if there wasn't value to the taxpayer I would question whether or not we want to enter into this type of arrangement.

Mr. TONKO. OK. And SPRO is able to draw down and deliver crude oil within 13 days?

Mr. WINBERG. Yes, sir.

Mr. TONKO. Are you confident that space can be leased without slowing down the Federal Government's ability to utilize SPRO?

Mr. WINBERG. That would be one of the key issues or key elements of any leasing program that we entered into with commercial clients but also with other countries, if we chose to go that route.

The American taxpayers bought and paid for this thing. They have maintained it for the last 40 years. So our responsibility is to the U.S. taxpayers to make sure that, A, we are meeting our domestic oil requirements and, B, that we are meeting our international requirements as well.

Mr. TONKO. And I appreciate that.

In the Northeast, we are particularly vulnerable to supply disruptions, which can be caused by natural disasters such as a hurricane like Superstorm Sandy.

The Northeast gasoline supply reserve was created to mitigate those risks and, thankfully, it hasn't been needed yet. But that doesn't mean it won't be needed in the future.

So I would really caution the administration against trying to dissolve this reserve. I think, again, for our region of the country it's of great concern.

And with that, I thank the chair and yield back.

Mr. OLSON. Thank you.

And seeing no further witnesses, members seeking to ask questions, I'd like to thank you, Mr. Winberg, for coming today.

All members should know they have 5 days to submit questions for the—10 days—another panel. OK. I'll back off.

Thank you, Mr. Winberg. Before you leave, as Vice Chairman Barton will confirm with your boss, you have to say gig 'em over and over. Thumbs up. Gig 'em, Aggies.

Mr. WINBERG. Thank you.

Mr. OLSON. Uh-oh. Is your mic? You sure? One more time.

Thank you, Mr. Winberg.

Mr. WINBERG. Thank you.

Mr. OLSON. Second panel, please come up.

It looks like we are ready so let's kick off the second panel.

Our witnesses for the second panel today include Mr. Frank Rusco, Director of Natural Resources and Environment at the GAO; Mr. Daniel Evans, Project Manager for Fluor Federal Petroleum Operations; and Mr. Kevin Book, Managing Director for ClearView Energy.

We are so thankful for you all being here today. We will begin this panel with Mr. Frank Rusco. You are recognized for 5 minutes to give an opening statement.

STATEMENTS OF FRANK RUSCO, DIRECTOR, NATIONAL RESOURCES AND ENVIRONMENT, GOVERNMENT ACCOUNTABILITY OFFICE; DANIEL M. EVANS, PROJECT MANAGER, FLUOR FEDERAL PETROLEUM OPERATIONS; KEVIN BOOK, MANAGING DIRECTOR, CLEARVIEW ENERGY PARTNERS, LLC

STATEMENT OF FRANK RUSCO

Mr. RUSCO. Thank you, Mr. Chairman, Ranking Member, and members of the subcommittee.

I am pleased to be here today to discuss our recent report on DOE's management of the SPR. The SPR is an important energy security asset capable of mitigating negative effects of global oil supply disruptions in concert with other IEA member countries. In several collective actions of IEA members, the SPR has been effective at adding oil supply during actual or expected supply disruptions.

To date, however, the SPR has most often been used in response to domestic supply disruptions caused by extreme weather. In such events, the SPR has been less effective because SPR infrastructure has not been able to deliver reserves when, where, and in the form they are needed.

In particular, when severe weather has battered Gulf Coast states, damaging refineries or electricity grids needed to run pipelines, SPR oil reserves in the Gulf Coast have not been effective in mitigating what have generally been shortages in finished petroleum products such as gas line and diesel fuel.

Most IEA member countries hold significant parts of their strategic reserves as petroleum products. DOE has studied such product reserves and the conclusions of its studies point to net benefits in some regions. Yet, DOE has disagreed with our recommendation to complete these studies and advise Congress of its findings.

In addition, we found that DOE's most recent strategic analysis of the SPR, which was mandated by Congress, was deficient in several key ways. These deficiencies denied Congress better information to make decisions about the size, disposition, and configuration of the SPR.

For example, DOE did not do adequate risk-based scenario analyses of when the SPR may be called upon to deliver oil or petroleum products and, as a result, DOE cannot advise Congress on even a credible range of sizes, composition, or disposition of reserves that would best enhance energy security across a range of potential future events.

Further, in part, because of the way in which the SPR has been used over the years and in part just because needed maintenance has been deferred for many years, the SPR storage and delivery infrastructure is in serious disrepair.

DOE's current plan is to rebuild the existing SPR infrastructure in its historical configuration and capacity. If this is done and, given planned future sales of SPR oil, the SPR will have excess storage capacity in the future. However, DOE made its plan to rebuild and repair SPR infrastructure without adequately studying alternatives, including selling or leasing such excess capacity.

The discussion draft that is the focus of this hearing goes a long way toward requiring DOE to rectify some of the deficiencies in its

strategic study and its SPR modernization plan. Specifically, the discussion draft requires DOE to take actions to evaluate and test the market for leasing its excess capacity by, one, authorizing the leasing of storage and related facilities to private sector and foreign entities; two, directing revenue earned from such leases to the general fund and to cover costs associated with leasing; and three, requiring a pilot program to lease 200 million barrels of excess capacity.

To make fiscally prudent decisions about how to implement such a pilot, DOE will have to conduct additional analyses. For example, DOE's decision to use fresh water to displace oil during releases has caused the SPR's salt caverns to deteriorate over time with use.

Fresh water absorbs salt, which increases the size and alters the shape of caverns and damages their integrity. Alternatively, there are salt cavern facilities operated by the private sector that use brine to displace that oil during release, which does not have these effects.

Brine ponds add operation and maintenance costs but increase the life of caverns. Ideally, GAO should evaluate this and many other factors we have identified before finalizing its modernization plans to ensure the SPR is run in an effective and fiscally prudent manner.

Thank you. This ends my oral remarks. I'll be happy to answer questions.

[The prepared statement of Mr. Rusco follows:]



United States Government Accountability Office

Testimony

Before the Subcommittee on Energy,
Committee on Energy and Commerce,
House of Representatives

For Release on Delivery
Expected at 10:15 a.m. ET
Tuesday, July 24, 2018

STRATEGIC PETROLEUM RESERVE

Observations on the Emergency Stockpile

Statement of Statement of Frank Rusco, Director,
Natural Resources and Environment

Chairman Upton, Ranking Member Rush, and Members of the Subcommittee:

I am pleased to be here today to discuss our recent report on the Department of Energy's (DOE) Strategic Petroleum Reserve (SPR).¹ More than 4 decades ago, Congress authorized the creation of the SPR—currently the world's largest government-owned stockpile of emergency crude oil—to reduce the impact of disruptions in supplies of petroleum products.² DOE manages the SPR. As of March 2018, the SPR held 665.5 million barrels of crude oil, worth about \$42 billion.³ In the decades since its creation, the structure of the SPR generally has not changed—it has always held crude oil in salt caverns along the Gulf Coast—though markets for crude oil and petroleum products—products such as gasoline and diesel that are refined from crude oil for final consumption—have changed in important ways.

Throughout most of the SPR's history, domestic crude oil production was generally in decline, while consumption of petroleum products was generally increasing, causing the United States to rely increasingly on imported crude oil and petroleum products. However, the SPR now operates in a context of increasing U.S. crude oil production (the United States is now one of the world's largest crude oil producers), relatively stable consumption, and shrinking net crude oil and petroleum product imports. Moreover, whereas the Arab oil embargo of 1973 to 1974 led to shortages and long lines at gas pumps around the country, prices now change to accommodate supply and demand, so that physical crude oil shortages are less of a concern than they were in the 1970s when the SPR was created.

The SPR also helps the United States meet its obligations as a member of the International Energy Agency (IEA)—an international energy forum of 30 member countries established in 1974 to help members respond

¹GAO, *Strategic Petroleum Reserve: DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile*, GAO-18-477 (Washington, D.C.: May 30, 2018).

²Energy Policy and Conservation Act, Pub. L. No. 94-163, §§ 151(b), 154(a), 89 Stat. 871, 881-882 (1975) (codified as amended at 42 U.S.C. §§ 6231(b), 6234(a)).

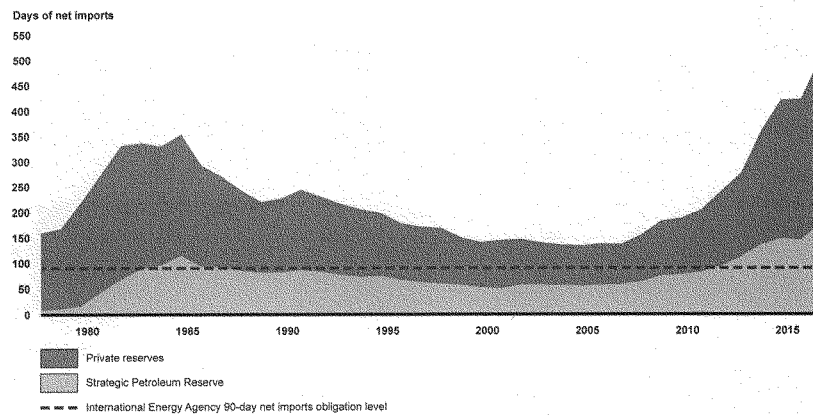
³This calculation is based on average market oil prices as of March 2018 of about \$63 per barrel, the price of West Texas Intermediate, which is a domestic oil used as a benchmark for pricing.

collectively to major energy supply disruptions.⁴ To become a member of the IEA, a country must have, among other things, crude oil or petroleum product reserves equivalent to 90 days of the previous year's net imports, and measures in place to ensure that it is able to contribute its share of a collective action initiated in response to a significant global oil supply disruption. As of March 2018, according to IEA data, the SPR held the equivalent of 138 days of net imports. The IEA counts both public and private reserves toward meeting the 90-day reserve obligation, although the United States has recently met this obligation solely through publicly owned reserves in the SPR, as shown in figure 1.⁵

⁴The 30 member countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Mexico, The Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States.

⁵Public reserves are owned by the government or an independent organization set up by the government, known as an agency. Private reserves, also called industry reserves, are oil or petroleum products held by industry for commercial and operational purposes as well as oil or petroleum products held by industry to meet minimum national reserve requirements.

Figure 1: U.S. Holdings in the Strategic Petroleum Reserve and Private Reserves, 1977-2017



Source: GAO analysis of U.S. Energy Information Administration data. | GAO-18-875T

Note: This figure represents holdings in the Strategic Petroleum Reserve in terms of days of net imports rather than volume of crude oil held in the reserve.

Since 2015, six laws mandated sales of crude oil from the SPR to fund the modernization of SPR facilities and other national priorities.⁶ Total planned sales are projected to reduce the amount of crude oil held in the SPR from 665.5 million barrels in March 2018 to 405 million barrels by the end of fiscal year 2027.⁷ These sales have an estimated value of almost \$16 billion, according to Congressional Budget Office documents. Of the total estimated value, sales of up to \$2 billion were specifically authorized for the SPR's modernization program. The SPR's infrastructure of facilities, pipelines, pumps, and other equipment is aging and much of it needs replacement, according to DOE documents. Since 2014, DOE has developed plans for modernizing the SPR to address these needs, among other things.

My testimony today discusses findings from our May 2018 report on the SPR and focuses on (1) how the United States and other IEA members meet their IEA obligations, (2) the extent to which DOE has identified the optimal size and the potential need for additional petroleum product reserves for the SPR, and (3) the extent to which DOE's plans for modernizing the SPR take into account the effects of current and potential future congressionally mandated oil sales.

⁶Specifically, the Bipartisan Budget Act of 2015 provided for the drawdown and sale of a total of 58 million barrels of crude oil from fiscal years 2018 through 2025 and authorized the sale of up to \$2 billion worth of oil, with the proceeds to be deposited in an Energy Security and Infrastructure Modernization Fund, the purpose of which is to provide for the construction, maintenance, repair, and replacement of SPR facilities. Pub. L. No. 114-74, §§ 403, 404, 129 Stat. 584, 589 (2015). The Fixing America's Surface Transportation Act provided for the drawdown and sale of a total of 66 million barrels of crude oil from fiscal years 2023 through 2025. Pub. L. No. 114-94, § 32204, 129 Stat. 1311, 1740 (2015). The 21st Century Cures Act provided for the drawdown and sale of a total of 25 million barrels from fiscal years 2017 through 2019. Pub. L. No. 114-255, § 5010, 130 Stat. 1033, 1197 (2015). The Tax Cuts and Jobs Act provided for the drawdown and sale of 7 million barrels of crude oil from fiscal years 2026 through 2027. Pub. L. No. 115-97, § 20003 (2017). The Bipartisan Budget Act of 2018 provided for the drawdown and sale of a total of 100 million barrels of crude oil from fiscal years 2022 through 2027. Pub. L. No. 115-123, § 30204 (2018). The Consolidated Appropriations Act of 2018 provided for the drawdown and sale of 10 million barrels of crude oil from fiscal years 2020 through 2021. Pub. L. No. 115-141, Div. O, § 501 (2018). The mandated drawdowns are not to be conducted if they would limit the authority to sell petroleum products for emergency protection in the full authorized quantity. See 42 U.S.C. § 6241(h).

⁷According to the U.S. Energy Information Administration, volumes of oil sold under the Bipartisan Budget Act of 2015, worth up to the \$2 billion authorized for an SPR modernization program are estimated. The estimated volume of oil is derived from oil sold in fiscal years 2017 and 2018 and forthcoming sales in fiscal years 2019 and 2020, according to DOE.

To conduct this work, we reviewed documents, reports, and studies that we identified through DOE officials, recommendations from experts and stakeholders, and sources referenced in DOE publications as well as our prior work on the SPR. We also interviewed DOE officials and representatives of energy consulting groups and a state agency, among others. Our May 2018 report includes a detailed discussion of the objectives, scope, and methodology used to conduct this work. We conducted the work on which this testimony is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform audits to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions. We believe that the evidence obtained provided a reasonable basis for our findings and conclusions based on our audit objectives.

Unlike the United States, Most IEA Members Rely on Private Reserves to Meet Reserve Obligations and Hold Significant Proportions of Their Reserves as Petroleum Products

As we found in our May 2018 report,⁸ in terms of how they meet their IEA 90-day reserve obligations, most other IEA members differ from the United States in two basic ways. First, as of December 2017, most other IEA members rely at least in part on private rather than public reserves to meet their obligations. As of December 2017, 18 of the 25 IEA members that met their 90-day reserve obligation and had a formal process for holding and releasing reserves relied entirely or in part on private reserves to meet their obligations.⁹ Specifically, based on IEA data as of December 2017, these 18 countries met their 90-day reserve obligations through private reserves and either had no public reserves or had public reserves of less than 90 days. Unlike the 18 countries that rely at least in part on private reserves, as of December 2017, the United States and 6 other IEA members met the 90-day reserve obligation exclusively through public reserves. The second way other IEA members differ from the United States is that most hold at least a third of their reserves as petroleum products, according to a 2014 IEA report.¹⁰ Holding petroleum

⁸GAO-18-477.

⁹Of the 29 IEA member nations as of December 2017, 25 members had two common attributes: (1) as net importers, they had a 90-day reserve obligation and met that obligation, and (2) they had formal processes for holding and releasing these reserves. According to IEA documents, as of December 2017, 3 member countries were net exporters and so did not have a 90-day obligation. In addition, according to IEA officials, Australia did not hold the equivalent of 90 days of net imports in December 2017. Mexico joined the IEA in early 2018 and was not a member nation as of December 2017.

¹⁰International Energy Agency, *Energy Supply Security, Emergency Response of IEA Countries* (Paris, France: 2014).

products can be advantageous during certain disruptions because such reserves can be directly distributed to consumers, whereas crude oil must first be refined and turned into products, adding response time. In contrast, more than 99 percent of the SPR (665.5 million barrels as of March 2018) is held as crude oil. Because of the large U.S. refining sector, crude oil from the SPR can be domestically refined into petroleum products to meet demand.

DOE Has Not Identified the Optimal Size for the SPR or the Potential Need for Regional Product Reserves

As we found in our May 2018 report,¹¹ DOE has not identified the optimal size or the potential need for additional petroleum product reserves for the SPR. In 2016, DOE completed a long-term strategic review of the SPR after its last comprehensive examination had been conducted in 2005.¹² The 2016 review examined the expected benefits of several SPR sizes, but it did not identify an optimal size and was limited in several ways. In particular, in the review, DOE did not fully consider recent and expected future changes in market conditions, such as the implications of projected fluctuations in net imports or the role of the private sector in responding to supply disruptions. Recent changes have contributed to SPR and private reserves reaching historically high levels on a net imports basis. These changes are expected to continue to evolve—according to government projections, the United States will become a net exporter in the late 2020s before again becoming a net importer between 2040 and 2050. In February 2005, we found that agencies should reexamine their programs if conditions change.¹³ Without addressing the limitations of its 2016 review and periodically performing reexaminations in the future, DOE cannot be assured that the SPR will be sized appropriately into the future. In May 2018, we recommended that DOE (1) supplement its 2016 review by conducting an additional analysis that takes into account, among other things, the costs and benefits of a wide range of different SPR sizes and (2) take actions to ensure that it

¹¹GAO-18-477.

¹²U.S. Department of Energy, *Long-Term Strategic Review of the U.S. Strategic Petroleum Reserve: Report to Congress*, (Washington, D.C.: August 2016). The Bipartisan Budget Act of 2015 directed the Secretary of Energy to develop and submit to Congress a proposed action plan that, among other things, identifies the configuration and performance capabilities of the SPR and recommends an action plan to achieve the optimal capacity, location, and composition of petroleum products in the SPR. Pub. L. No. 114-74, § 402, 129 Stat. 584, 589 (2015).

¹³GAO, *21st Century Challenges: Reexamining the Base of the Federal Government*, GAO-05-325SP (Washington, D.C.: Feb. 1, 2005).

periodically conducts and provides to Congress a strategic review of the SPR. DOE partially agreed with the first recommendation and stated that it will conduct an additional analysis to assess the purpose, goals, and objectives of the SPR, taking into account private sector response, oil market projections, and any other relevant factors, that will lead to an evaluation of possible optimal sizes of the SPR in the future. DOE agreed with the second recommendation.

DOE has also not fully identified whether additional regional petroleum product reserves should be part of the SPR. The Quadrennial Energy Review of 2015 recommended that DOE analyze the need for additional or expanded regional product reserves by undertaking updated cost-benefit analyses for all of the regions of the United States that have been identified as vulnerable to fuel supply disruptions.¹⁴ In response, DOE studied the costs and benefits of regional petroleum product reserves in the West Coast and Southeast Coast, though it did not finalize or publicly release these studies. Nevertheless, the draft studies concluded that a product reserve in the Southeast would provide significant net economic benefits to the region and the United States, particularly in the event of a major hurricane, while further analyses are needed to determine the potential benefits of a reserve on the West Coast.¹⁵ According to DOE officials, the agency has no plans to conduct additional studies. Without completing studies on the costs and benefits of regional petroleum product reserves, DOE cannot ensure that it and Congress have the information they need to make decisions about whether additional regional product reserves are needed. In our May 2018 report, we recommended that DOE conduct or complete such studies. DOE disagreed with this recommendation, though we continue to believe that

¹⁴U.S. Department of Energy, *Quadrennial Energy Review: Energy Transmission, Storage, and Distribution Infrastructure*, April 2015. A 2014 Presidential memorandum created a Quadrennial Energy Review Task Force, co-chaired by the Directors of the Domestic Policy Council and the Office of Science and Technology Policy, with support from the Secretary of Energy. The Quadrennial Energy Review Report, to be submitted to the President every 4 years, is to, among other things, provide an integrated view of, and recommendations for, federal energy policy in the context of economic, environmental, occupational, security, and health and safety priorities, with attention in the first report given to the challenges facing the nation's energy infrastructures. The first report was issued in April 2015.

¹⁵While this finding of the draft 2015 studies is pre-decisional and was not approved by DOE, we report it here because DOE has relied on related findings from the draft 2015 studies in its response to GAO-18-477.

conducting these analyses will provide Congress with needed information.

DOE Has Taken Steps to Update Its Modernization Plans but Is Hindered by Uncertainty Regarding the SPR's Long-term Size

As we found in our May 2018 report,¹⁶ DOE has taken steps to account for the effects of congressionally mandated oil sales in its plans for modernizing the SPR, though DOE's current plans, developed in 2016, are based on information largely developed prior to recent congressionally mandated sales of an additional 117 million barrels of oil. According to DOE documents, the SPR modernization program is focused on a life extension project to modernize aging infrastructure to ensure that the SPR will be able to meet its mission requirements for the next several decades. The project's scope of work has undergone several revisions since its inception in response to changing conditions and requirements, according to the agency.¹⁷ DOE has estimated that the SPR's 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. According to DOE officials, in March 2018, DOE commenced a study—the SPR post-sale configuration study targeted for completion in October 2018—to examine potential future reserve configurations and to account for the effects of congressionally mandated sales on the reserve and its modernization. Information from the study will inform DOE's updates to the SPR's modernization plans, according to DOE officials.

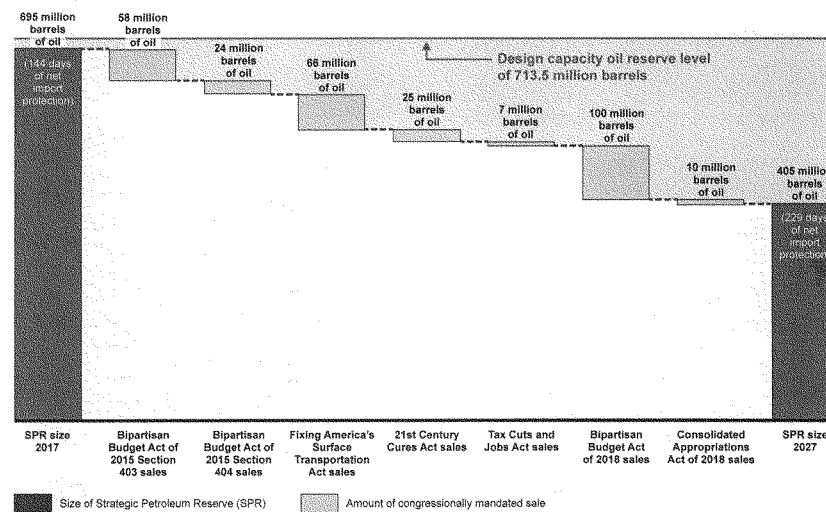
Although the SPR had a design capacity to hold 713.5 million barrels of oil, in January 2017, the SPR held 695 million barrels. As shown in figure 2, congressionally mandated sales will cause excess storage capacity to grow to 308 million barrels or more by the end of fiscal year 2027—meaning that about 43 percent of the SPR's total design capacity to store oil would be unused.¹⁸

¹⁶GAO-18-477.

¹⁷Since 2016, DOE conducted additional supplemental analysis of alternatives to update its modernization plans, which resulted in additions and deletions of tasks from the project's original scope of work, according to the agency.

¹⁸According to DOE officials, as part of contingency planning, spare capacity is required in the event that oil must be removed from a cavern and the cavern is rendered unsuitable for oil storage. Moreover, natural creep on storage caverns reduces the amount of storage capacity across the SPR, with the reserve losing about 1.2 million barrels per year across the SPR to natural cavern creep, and another 1 million barrels per year are lost due to depressurizing caverns, according to DOE officials.

Figure 2: Oil Inventory Held in the Strategic Petroleum Reserve in 2017 and Projected Oil Inventory in 2027 Compared to the Reserve's Design Capacity in 2017



Sources: GAO analysis of U.S. Department of Energy and U.S. Energy Information Administration data. | GAO-18-675T

Note: Volumes of oil to be sold under section 404 of the Bipartisan Budget Act of 2015 (sales to fund SPR modernization) are U.S. Department of Energy estimates.

In its ongoing SPR post-sale configuration study, DOE plans to explore some options to use potentially excess SPR assets, such as spare storage capacity. In withdrawing oil to meet congressionally mandated oil sales currently in place (290 million barrels through fiscal year 2027), DOE could close at least one SPR site based on our analysis of projected excess storage capacity. For example, if DOE were to close the smallest SPR site, Bayou Choctaw in Louisiana, the agency could also explore selling the connected pipeline and marine terminal, which are currently being leased to a private company. DOE could also consider leasing

excess storage capacity to other countries so that they could store oil at the SPR.¹⁹ DOE had not entered into any such leases with other countries and had not considered such leases as of May 2018 because, according to DOE, the SPR has historically lacked capacity to store additional oil. DOE had not proposed any of these options or explored the revenue the agency could generate by selling or leasing these assets. However, according to DOE officials, the agency will examine the feasibility of such options in the ongoing SPR post-sale configuration study.

In the course of our work, we also identified other options for handling potentially excess SPR assets that DOE was not planning on examining as of May 2018, largely because DOE did not have the authority to pursue them, according to agency officials. First, DOE could explore leasing storage capacity to private industry. U.S. oil production has generally increased over the last decade. As a result, the private sector may want to lease excess SPR capacity, which may be cheaper than above-ground storage, according to a representative of a private company we interviewed. Fees for doing so could help defray SPR storage or maintenance costs. However, agency officials told us that the Energy Policy and Conservation Act gave DOE authority to lease underutilized storage to other countries but not to the private sector. Second, if Congress determines that the SPR holds oil in excess of that needed domestically, DOE could explore selling contingent contracts for the excess oil rather than selling the oil outright.²⁰ Australian and New Zealand officials told us that such contracts would help their countries meet their IEA 90-day reserve obligations.

Australian officials told us that they have discussed this option with DOE. Currently the United States and Australia have agreed, through an arrangement, to allow Australia to contract for petroleum stocks located in the United States and controlled by commercial entities. While the arrangement does not cover government-owned oil in the SPR, if it did, based on our analysis, DOE could generate up to approximately \$15 million if Australia purchased the maximum allowable amount of oil

¹⁹The Energy Policy and Conservation Act provides that the Secretary of Energy, by lease or otherwise, may store in underutilized SPR facilities petroleum product owned by a foreign government or its representative. 42 U.S.C. § 6247a(a).

²⁰Under such contingent contracts, also called tickets, a seller agrees to deliver to the buyer an amount of oil or petroleum products if a specified event occurs, such as an IEA collective action, in return for an agreed-upon fee.

specified in an arrangement through contracts for excess SPR oil in 2018.²¹ However, although the Energy Policy and Conservation Act allows DOE to lease underutilized storage to other countries, DOE lacks the authority to sell contracts for the oil and does not plan to seek this authority, according to DOE officials. DOE officials told us that they did not plan to examine these options.

According to DOE's real property asset management order, the agency is to identify real property assets that are no longer needed to meet the program's mission needs and that may be candidates for reuse or disposal.²² Once identified, the agency is to undertake certain actions, including determining whether to dispose of these assets by sale or lease. As part of its SPR post-sale configuration study, DOE plans to determine whether it is appropriate to close SPR facilities, and the relative benefit of any closures would be informed by potential lease revenues from maintaining sites so they could be leased, according to agency officials. However, as mentioned previously, we identified other options for handling potentially excess SPR assets that DOE was not planning to examine in its study. Although DOE does not currently have the authority to implement these options, according to officials, examining their potential use, including possible revenue enhancement, could inform Congress as it examines whether it should grant such authority. Without examining a full range of options in the SPR post-sale configuration study, DOE risks missing beneficial ways to modernize the SPR while saving taxpayer resources. In May 2018, we recommended that in completing its ongoing SPR post-sale configuration study, DOE should consider a full range of options for handling potentially excess assets and, if needed, request congressional authority for the disposition of these assets. DOE agreed with this recommendation.²³

Finally, as DOE takes steps to plan for the SPR's modernization, ongoing uncertainty regarding the SPR's long-term size and configuration have complicated DOE's efforts. Congress has generally set the SPR's size by

²¹The estimated amount is based on average monthly projected ticket prices in 2018 for crude oil and an arrangement between the United States and Australia that outlines the maximum amount of oil that Australia can purchase in the form of tickets from commercial entities located in the United States.

²²U.S. Department of Energy, *Real Property Asset Management*, DOE Order 430.1C (Washington, D.C.: August 2016).

²³GAO-18-477.

mandating purchases or sales of oil. DOE officials told us they do not know whether Congress will mandate additional sales over the next 10 years or whether other changes may be required to the configuration of the reserve. Any additional congressionally mandated sales would require DOE to again revisit its modernization plans and assessments of the potential uses of any excess SPR assets. Oil market projections also have implications for the future of the SPR. The United States is projected to become a net exporter by the late 2020s and would then no longer have a 90-day reserve obligation, but it is projected to return to being a net importer between 2040 and 2050. These projected fluctuations could affect the desired size of the SPR in the future. Such uncertainties create risks for DOE's modernization plans, as DOE may end up spending funds on facilities that later turn out to be unnecessary should Congress ultimately decide on a larger- or smaller-sized SPR than DOE anticipates. In May 2018, we suggested that Congress may wish to consider setting a long-range target for the size and configuration of the SPR that takes into account projections for future oil production, oil consumption, the efficacy of the existing SPR to respond to domestic supply disruptions, and U.S. IEA obligations.²⁴

In conclusion, we found that given the constrained budget environment and the evolving nature of energy markets and their vulnerabilities, it is important that DOE endeavor to ensure that the SPR is an efficient and effective use of federal resources.

Chairman Upton, Ranking Member Rush, and Members of the Subcommittee, this concludes my prepared statement. I would be pleased to answer any questions that you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff members have any questions about this testimony, please contact Frank Rusco, Director, Natural Resources and Environment, at (202) 512-3841 or ruscof@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. Key contributors to this testimony included Quindi Franco (Assistant Director), Nkenge Gibson (Analyst-in-Charge), Philip Farah, Ellen Fried, Cindy Gilbert, Gregory Marchand, Celia Mendive, Patricia Moye, Camille Pease, Oliver Richard, Dan Royer, Rachel Stoiko, and Marie Suding.

²⁴GAO-18-477.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

**Obtaining Copies of
GAO Reports and
Testimony**

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's website (<https://www.gao.gov>). Each weekday afternoon, GAO posts on its website newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to <https://www.gao.gov> and select "E-mail Updates."

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <https://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on Facebook, Flickr, Twitter, and YouTube. Subscribe to our RSS Feeds or E-mail Updates. Listen to our Podcasts. Visit GAO on the web at <https://www.gao.gov>.

**To Report Fraud,
Waste, and Abuse in
Federal Programs**

Contact:

Website: <https://www.gao.gov/fraudnet/fraudnet.htm>

Automated answering system: (800) 424-5454 or (202) 512-7700

**Congressional
Relations**

Orice Williams Brown, Managing Director, WilliamsO@gao.gov, (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800, U.S. Government Accountability Office, 441 G Street NW, Room 7149, Washington, DC 20548

**Strategic Planning and
External Liaison**

James-Christian Blockwood, Managing Director, spel@gao.gov, (202) 512-4707, U.S. Government Accountability Office, 441 G Street NW, Room 7814, Washington, DC 20548



Please Print on Recycled Paper.

Mr. OLSON. Thank you, Mr. Rusco.
 Mr. Evans, 5 minutes for an opening statement, sir.
 Microphone, please. Hit the right button here.
 Mr. EVANS. I am here. There we go. Start again.

STATEMENT OF DANIEL EVANS

Mr. EVANS. Good morning, Vice Chairman Olson, Ranking Member Rush, and members of the Subcommittee on Energy.

I am the Project Manager for Fluor Federal Petroleum Operations, Dan Evans. We are the maintenance and operation contractor for the Department of Energy at the Strategic Petroleum Reserve since 2004.

Fluor's partnerships with DOE date back to the Manhattan Project. Today, in addition to the SPR, we are currently active in roles with DOE facilities that are part of the Environmental Management and National Nuclear Security Administration missions.

The congressionally-mandated sales have changed the day-to-day operations of the SPR dramatically. The sites have gone from a 4.4 million barrel per day draw down and readiness posture to maintaining draw down readiness while at the same time conducting intermediate variable rate deliveries from the reserves.

Working with DOE, Fluor has met this challenge. One example is the response to the impacts to Hurricane Harvey. We were able to maintain mission draw down readiness throughout the event and deliver approximately 5 million barrels of crude oil to refineries in need.

I would like to note that to support this need, certain employees volunteered to leave their own homes at peril, their whole families, and endure the hurricane at the Texas sites. They provided day-to-day monitored conditions and real time updates on the readiness for us to fill the Nation's mission. The dedication of SPR employees to the mission is American exceptionalism at its finest.

The sales have and continue to put a significant level of stress on aging SPR infrastructure. In some cases, we have postponed planned maintenance and diverted funding to address emergency repairs.

As we continue the draw down over the next 9 years, Congress should not lose sight of the importance of the SPR's annual maintenance funding to be able to address the needs of the sites and make necessary repairs to execute the current contemplated draw down schedule.

Next, I would like to address the ideas raised by the subcommittee's discussion draft. Fluor, of course, stands ready to support the leasing and operation of underutilized cavern capacity.

We anticipate in the particular draft legislation the committee has provided the authorization without further appropriation to use a portion of leased revenue cost related to storage and removal incurred by the SPR as a result of releases.

Commercially-leased petroleum storage currently presently operates under one of two models: segregated or co-mingled. In segregated storage, the product accepted for storage is the same product that is ultimately delivered. Under the co-mingled model, a limited range of products are accepted for storage.

When a withdrawal is made, a product of agreed to specification is then provided to the owner of the equivalent product that was accepted into storage.

Either model presents challenges for leasing at SPR facilities while maintaining government inventories. Presently, the government practices intensive inventory management—segregating crude oil by two specifications and tracking the volumes down to the very barrel not only across caverns but also with piping, pipelines, and crude oil storage tanks.

If the SPR designates specific caverns to be leased for storage under the segregated model, the cavern is nonetheless integrated into the site infrastructure.

The operation of a storage cavern requires routine ability to convey crude oil, water, and salt brine in and out of the cavern for purpose of preventative and corrective maintenance.

The cycling of fluids in and out of leased caverns with equipment in common with the SPR storage caverns will, inevitably, lead to co-mingling of government and commercial assets which will, in our opinion, require additional capital investments. The co-mingled model shares the same challenges of the segregated model and also adds additional complexities in terms of product quality matters and tracking thereof.

In conclusion, two policy issues require resolution prior to implementing a lease storage concept. The first, it's a target inventory of the SPR.

Congress should also carefully consider the overall leasing concept to be adopted. We strongly recommend that should Congress move forward with a leasing regime, it allows sufficient time to make this determination and to develop and physically implement the necessary SPR enhancements.

Mr. Vice Chairman, thank you again for the opportunity to appear here today. I stand by to answer any questions that you might have.

[The prepared statement of Mr. Evans follows:]

**Summary of Testimony
Statement by Daniel M. Evans
Project Manager
Fluor Federal Petroleum Operations, LLC**

**Hearing on
“DOE Modernization:
Legislation to Authorize a Pilot Project to
Commercialize the Strategic Petroleum Reserve”**

July 24, 2018

- As a result of Congressionally mandated crude oil sales, the SPR anticipates having approximately 300 million barrels of unused cavern storage capacity by the end of FY2027.
- SPR caverns are designed for long-term storage. Consequently, they can sustain relatively few storage and retrieval cycles.
- To protect the cavern asset, considerable investment and a significant period of construction are necessary to develop a salt brine source to support product retrieval operations.
- In addition to fiscal matters, Congress should carefully consider two policy issues prior to finalizing any leased storage program:
 1. The future inventory requirements of the SPR, as the government forecasts that net imports will be negligible by 2030.
 2. Whether the SPR should accept crude oil for storage under a single specification, allowing commingling of oil by multiple lessees, or only storage segregated from the SPR inventory as well as other lessees.

Statement by Daniel M. Evans

**Project Manager
Fluor Federal Petroleum Operations, LLC
Contractor to the U. S. Department of Energy**

**Before the
Subcommittee on Energy
House Committee on Energy and Commerce
U.S. House of Representatives**

**Hearing on
“DOE Modernization:
Legislation to Authorize a Pilot Project to
Commercialize the Strategic Petroleum Reserve”**

July 24, 2018

Good morning, Chairman Upton, Ranking Member Rush, and Members of the Energy and Commerce Subcommittee on Energy. My name is Dan Evans. I am the Project Manager of Fluor Federal Petroleum Operations (“FFPO”), the current Management and Operations (“M&O”) contractor for the U.S. Department of Energy (“DOE”) at the Strategic Petroleum Reserve (“SPR”). Today, I am representing our more than 500 employees located at six SPR facilities in Louisiana, Texas, and Mississippi.

Fluor Corporation

Founded in 1912, Fluor Corporation is one of the world’s largest publicly traded engineering, procurement, construction, maintenance and project management companies. A Fortune 500 company with over 56,000 employees, Fluor serves multiple business segments, including energy and chemicals, industrial and infrastructure, power, as well as providing services to United States Government and international agencies across the globe.

In 2017, 55% of Fluor's revenue came from the energy, chemicals, and mining business segment. Projects around the world include building production facilities, pipelines, refineries, liquid natural gas, and petrochemical plants. Our government business line accounted for about 6% of revenue in 2017, supporting largely the Department of Energy, the Department of Defense, and the Department of Homeland Security. Fluor's partnership with the Department of Energy dates back to the Manhattan project. Today, in addition to the SPR, we currently have active roles at DOE facilities as part of the Environmental Management and National Nuclear Security Administration missions.

Fluor also has over 50 years of experience in the oil and gas industry and continues to expand on its experience in the Gulf Coast, from the construction of refineries, to recently completing expansions on those refineries, and providing maintenance support to clients into the future. Our ability to deliver experience both in the commercial and government sectors contributes to the success at SPR.

SPR Background

The mission of the SPR is to protect the United States economy from severe petroleum supply interruptions through the acquisition, storage, distribution, and management of emergency petroleum stocks, and to carry out U.S. obligations under the International Energy Program, which established the International Energy Agency ("IEA").

The SPR currently has a crude oil storage capacity of 713.5 million barrels ("MMB") and an inventory of approximately 660 MMB. As required by Congress, the SPR inventory level will be reduced to about 405 MMB by the end of FY 2027. Primarily distributed across three of the four SPR storage sites (Bryan Mound and Big Hill in Texas, and West Hackberry in Louisiana)

there will be approximately 300 MMB of unused storage capacity available by that year. The fourth and by far smallest SPR storage site, Bayou Choctaw in Louisiana, is not anticipated to significantly contribute to the volumes sold.

It is important to note that when the mandated sales are completed, the SPR will be unable to fully deliver its current mission requirement (under current IEA guidelines) of 4.4 MMB per day to the commercial marketplace for a period of 90 days. This will be a consequence of a lack of sufficient inventory distributed among the SPR's 60 storage caverns. Of course, any additional reduction of inventory (through sales or for other purposes) may limit the ability to maintain compliance with international requirements. Congress should consider the drawdown requirements if it decides to transition to a new role for the SPR.

Current Maintenance and Operations

At the SPR, crude oil is stored within salt caverns, large cavities mined in salt domes. These caverns typically have containment volumes ranging from 11 MMB (442 million gallons) up to 35 MMB (1.47 billion gallons) and crude oil storage capacities of approximately one-half a million barrels less than the full cavern volume. Their nominal replacement value is \$5 USD per barrel, or typically \$55 million per cavern.

The caverns are created by solution mining: the injection of water which dissolves the salt of the dome, creating a salt brine solution that is disposed of. Similarly, stored crude oil is produced from a cavern by injecting water to displace the crude oil, driving it into the product delivery infrastructure. Both the creation of the storage volume and the production of crude oil from storage dissolve the salt containment, increasing cavern volume. A finite quantity of salt

can be dissolved before the cavern becomes mechanically unstable and no longer suitable for crude oil storage.

Consequently, the number of times a storage cavern experiences a drawdown determines the operable lifetime of a cavern. SPR storage caverns were designed for infrequent use -- five complete drawdowns of stored crude oil, or five cycles of water injection. Absent significant infrastructure improvements, the caverns' operable lifetime can be quickly depleted through more frequent use.

The infrastructure required to maintain cavern integrity is a means of accessing large volumes of salt brine on demand, as a substitute for water during cavern drawdown. Salt brine has minimal effect upon the dissolution of a cavern's salt containment as it is already partially or fully saturated with salt; as a result, it is unable to accept significant volumes of additional salt into solution. Consequently, the useful life of a cavern is extended. The salt brine volumes required to empty a cavern could be in the range of 10 MMB (hundreds of millions of gallons). Regardless of the means of production, these volumes of brine cannot be sourced without significant investment.

The Congressionally mandated sales have changed the day-to-day operations of the SPR dramatically. The sites have gone from a 4.4 million barrel per day drawdown readiness posture to maintaining drawdown readiness while conducting intermittent, variable-rate deliveries from the reserves. FFPO has met this challenge. One example is the response to the impacts of Hurricane Harvey. We were able to maintain mission drawdown readiness throughout the event and deliver approximately 5MMB of crude oil to refineries in need. I would like to note that to support this need, certain employees volunteered to leave their own houses and families to

endure the hurricane at the Bryan Mound site in Freeport, TX. Throughout the storm employees monitored site conditions and provided real time updates on the readiness of the site to fulfill its mission. The dedication of SPR employees to the mission is American exceptionalism at its finest.

The sales have and continue to put a significant level of stress on aging SPR infrastructure. In some cases, we have had to postpone plans for planned maintenance and divert funding to address emergency repairs. As we continue the drawdown over the next nine years, Congress should not lose sight of the importance of SPR's annual funding to be able to address the needs of the sites, and make necessary repairs to safely execute the current planned drawdown schedule.

Potential Leasing of Underutilized SPR Storage Facilities

FFPO stands ready to support the leasing and operation of underutilized storage capacity and since 2014 has demonstrated its good stewardship of taxpayer money. We appreciate that in the draft legislation, the Committee has provided the authorization, without further appropriation, to use a portion of the lease revenue for the costs related to the storage and removal of petroleum products incurred by the SPR as a result of the leases.

FFPO believes that certain investments will need to be made in facility modifications prior to engaging in a pilot storage program. Although the draft legislation provides for reimbursement of costs incurred during leasing activities, it does not explicitly provide funding for necessary facility modifications. The extent of the modifications required will vary depending upon the lease terms. Long-term storage (many months to years) is more readily

accommodated by the current infrastructure; shorter lease periods (weeks to a few months) will require significant investment to extend the operational lifetime of the assets.

Leased Storage Models

Commercially leased petroleum storage presently operates under one of two models: segregated or commingled. In segregated storage, typical of above-ground storage of tank farms, the product accepted for storage is the same product that is ultimately delivered. This is a relatively simple accounting method.

Under the commingled model, a limited range (type, quality) of products are accepted for storage. All comparable products (*e.g.*, crude oils conforming to a particular specification) are stored without regard to preserving ownership identity. When a withdrawal is made, a product of agreed-to specification is provided that is equivalent to the product that was accepted for storage. Commingled storage is practiced by cavern storage operations similar to the SPR; a relevant example is the Louisiana Offshore Oil Port (“LOOP”) that accepts only defined grades of sour crude oil for storage.

Either model presents challenges to leasing storage in SPR facilities while maintaining government inventories. Presently the government practices intensive inventory management, segregating crude oil by two specifications (maximum sulfur content of 0.5% by volume and 0.5+% up to 2% sulfur content) and tracking the volumes to the barrel, not only across storage caverns but within piping and pipelines and crude oil storage tanks. Current practices are not readily amenable to commingled storage.

Segregated storage also presents challenges. If the SPR designates specific caverns for leased storage, commingling inventory only to the extent that it is all sourced from lessees, the

cavern is nonetheless integrated into the site infrastructure. A storage cavern requires the ability to convey crude oil, water, and salt brine into and out of the cavern for purposes of preventative and corrective maintenance. The cycling of fluids in and out of a leased cavern with equipment in common with the SPR storage caverns will inevitably lead to commingling of government and commercial assets. This commingling will lead to complex accountability issues which may drive the need for additional capital investments to ensure that the differing inventories are appropriately segregated.

Conclusion

Two issues require resolution prior to implementing a leased storage concept. The first is the target inventory level of the SPR, as this will determine the storage capacity available for lease. The SPR inventory goal has traditionally been rooted in satisfying our International Energy Agency (IEA) obligations to possess an inventory equivalent to 90 days of net crude oil imports. DOE and Congress are currently working to determine the appropriate level of SPR reserves based on global market conditions that are markedly different from the mid-1970s.

Congress should also carefully consider the overall leasing concept to be adopted by the SPR. At issue are such things as inventory segregation and minimum storage period, as discussed above. FFPO believes that the time period prior to the completion of legislatively mandated crude oil sales, at which time sufficient excess storage space becomes available, would most productively be spent in addressing these and other policy driven issues, and arriving at an agreement among all stakeholders as to the approach to be adopted. Congress should ensure that, once it defines any new mission, it allows for adequate time to develop and physically implement the SPR storage site enhancements necessary to facilitate storage space leasing.

* * *

Mr. Chairman, thank you again for the opportunity to appear here today. I would be happy to answer any questions you may have.

Mr. OLSON. Thank you, Mr. Evans.

Mr. Book, 5 minutes for an opening statement, sir.

STATEMENT OF KEVIN BOOK

Mr. BOOK. Thank you.

Good morning, Vice Chairman Olson, Ranking Member Rush, Vice Chairman Barton, distinguished members of this committee.

My name is Kevin Book. I lead the research team at ClearView Energy Partners, an independent firm that analyzes macro energy issues for institutional investors and corporate strategists.

Thank you for inviting me to contribute to your discussion regarding modernization of the SPR. I would like to begin by offering my admiration for the foresight the U.S. Congress showed in creating the SPR.

In my view it remains one of the greatest energy security achievements in modern history. It still matters, too. Even with U.S. crude production averaging 11 million barrels per day during the week ending July 13, that surge is good news. But those barrels already have customers.

As a government-controlled stockpile, the SPR can provide emergency supply that comes from outside the market. That said, ensuring against worldwide economic fallout and sheltering U.S. consumers may require a robust and well-functioning reserve capable of delivering its full design capability.

Today's discussion reflects that Congress has passed six major laws in the last 4 years that mandate, roughly, 300 million barrels of oil sales from the SPR. Those sales could leave the SPR with approximately 400 million barrels at the start of fiscal 2028. It, therefore, seems prudent to ask whether and how the resulting surplus storage capacity might be put to productive use.

Today's legislative draft would expand storage leasing currently available to foreign governments so that private commercial entities could lease SPR space too. In my opinion, a pilot leasing program of this sort could potentially benefit U.S. producers and refiners in need of additional storage.

If that program also helped to preserve or expand SPR capabilities at the same time, it could enhance petroleum supply insurance for U.S. consumers, too.

My testimony offers several additional considerations. From a feasibility perspective, DOE might wish to evaluate the costs of restoring, rehabilitating, or improving spare capacity to support the requirements of commercial lessees. Those requirements can differ in many cases from current long-term strategic storage requirements.

DOE might also wish to evaluate availability of takeaway capacity from leased storage sites, especially in the absence of incremental SPR marine distribution capacity. Storage with faster deliverability can command a higher market price also. From a competitiveness perspective, it may be useful for DOE to evaluate the market impact of introducing up to 2 million barrels of crude storage into the Gulf Coast, also known as PAD 3.

In March 2018, the Energy Information Administration, or EIA, counted 341.2 million barrels of working storage capacity at refineries, tank farms, and underground facilities in PAD 3. The agency

assessed that about 49 percent of that capacity was in use of that time. That was a big change from 2 years earlier. Storage volumes grew by 29.7 million barrels since the EIA's March 2016 report and did not report the agency-assessed PAD's restorage capacity at a much higher 68 percent capacity utilization.

It could be undesirable if additional low-cost government-run SPR storage were to crowd out existing privately operated facilities. Likewise, salt cavern storage tends to be significantly cheaper than tank storage and so-called floating storage in leased tankers. But draw down constraints and take-away bottlenecks could limit commercial demand compared to tank farms and ships.

Finally, from a strategic perspective, capacity leasing should probably also reflect the vision Congress and the department have for the reserve. For example, today's draft would allocate net balances to the general fund. It might be worth considering whether proceeds could also pay for expanded modernization.

To this point, the U.S. has dramatically reduced its net petroleum imports. But U.S. refiners still import gross volumes of about 6.3 million barrels per day. When they do, they pay global prices that reflect global supply demand balances. Today's oil prices remain high, relative to historical norms.

Partly, this is because global oil production is itself running at relatively high capacity utilization. Crude prices are also high because global inventories have thinned out.

Currently, OPEC producers are drawing on spare capacity to offset losses from collapsing Venezuelan production. They soon could lean even harder on spare production capacity to replace Iranian crude oil barrels.

That, by the way, set off my Siri. I apologize. I am not sure why.

And what happens when the production system is stressed and inventories are lean and a big supply disruption occurs somewhere in the world?

In that situation, without strategic reserves, the oil market must balance and painfully so on the backs of consumers. Preventing that result, in short, is the nature of the insurance the SPR provides.

Mr. Chairman, this concludes my prepared testimony. I will be happy to answer any questions at the appropriate time.

[The prepared statement of Mr. Book follows:]

TESTIMONY OF KEVIN BOOK
MANAGING DIRECTOR
CLEARVIEW ENERGY PARTNERS, LLC

BEFORE THE
U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENERGY

JULY 24, 2018

Good morning, Chairman Upton, Vice-Chairman Olson, Ranking Member Rush and distinguished Members of this Committee. My name is Kevin Book, and I lead the research team at ClearView Energy Partners, LLC, an independent firm that analyzes macro energy issues for institutional investors and corporate strategists. Thank you for inviting me to contribute to your discussion regarding the modernization of the Strategic Petroleum Reserve (SPR).

I was asked to offer my comments regarding a discussion draft of legislation that would authorize the Secretary of Energy to carry out a program to lease underutilized SPR facilities. This written testimony presents my comments regarding that text. I have also included several observations regarding the SPR itself intended to reiterate and strengthen points I have suggested during prior appearances before other Committees.¹

Let me begin by offering my admiration for the foresight the U.S. Congress showed in creating the SPR with the passage of the 1975 *Energy Policy and Conservation Act* (EPCA). In my view, the SPR remains one of the greatest energy security achievements in modern history. Not only does it continue to insure the U.S. economy against petroleum supply disruptions, but its vast scale also has potential to extend that insurance to U.S. allies and, indeed, to the global economy.

I would suggest that the SPR's importance for U.S. energy security has not diminished, even in the wake of last week's astounding estimate by the Energy Information Administration (EIA) that U.S. crude oil production averaged 11 MM bbl/d during the week ending July 13, an all-time peak. The U.S. oil surge is good news, in my opinion, but those barrels already have customers. As a government-controlled stockpile, the SPR can provide additional, extra-market supply in emergencies.

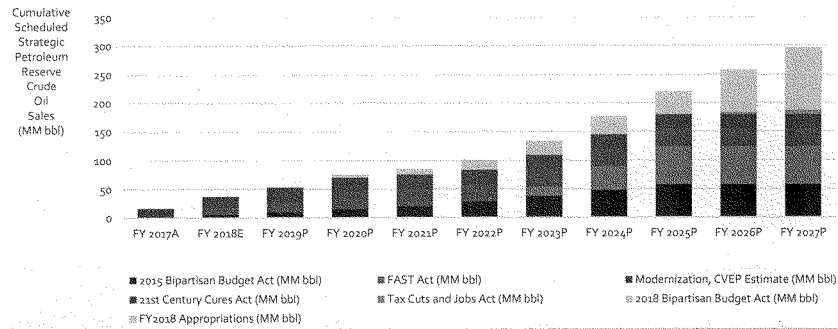
To serve this role, however, the Reserve must remain in working order. The Department of Energy (DOE) issued a *Long Term Strategic Review* of the SPR in August 2016 that identified "challenges related to the condition of physical assets and operational reliability." The review also outlined a modernization program to be paid for with up to \$2 B in proceeds from non-emergency crude sales pursuant to Section 404 of the 2015 *Bipartisan Budget Act*.

The DOE has thus far conducted two such sales totaling ~13.4 MM bbl, raising ~\$725 MM for the dedicated Energy Security and Infrastructure Modernization (ESIM) Fund created by Section 404. The version of the FY 2019 *Energy and Water, Legislative Branch, and Military Construction and Veterans Affairs Appropriations Act* that passed the Senate on June 25 would raise another \$350 MM (~4.67 MM bbl at a sale price of \$75/bbl).

Figure 1 (next page) tabulates these sales and several others mandated by six recent laws: the 2015 *Bipartisan Budget Act*, the 2015 *Fixing America's Surface Transportation Act* (FAST), the 2016 *21st Century Cures Act*, the 2017 *Tax Cuts and Jobs Act*, the 2018 *Bipartisan Budget Act* and the 2018 *Consolidated Appropriations Act*. My understanding is that proceeds from non-modernization sales go to the Treasury Department's General Fund rather than the ESIM Fund or the SPR Petroleum Account.

¹ See also October 6, 2015 testimony before U.S. Senate Committee on Energy and Natural Resources; June 9, 2011 testimony before U.S. Senate Committee on Energy and Natural Resources; May 12, 2009 testimony before the U.S. Senate Committee on Energy and Natural Resources; and April 4, 2008 testimony before the (former) U.S. House of Representatives Select Committee on Energy Independence and Global Warming.

Figure 1 – Congressionally Mandated Sales Imply ~300+ MM bbl of Spare Storage Capacity at 713.5 MM bbl Nameplate in FY 2028



FISCAL YEAR (OCTOBER 1 TO SEPTEMBER 30)	2015 BIPARTISAN BUDGET ACT (MM BBL)	FAST ACT (MM BBL)	MODERN- IZATION SALES (MM BBL) ¹	SCHEDULED SALES UNDER THE 21ST CENTURY CURES ACT OF 2016 (MM BBL)	SCHEDULED SALES UNDER THE 2017 TAX CUTS AND JOBS ACT (MM BBL) ²	SCHEDULED SALES UNDER THE 2018 BIPARTISAN BUDGET ACT (MM BBL) ³	SCHEDULED SALES UNDER FY2018 APPROPRIATIONS (MM BBL) ⁴	TOTAL PER FISCAL YEAR (MM BBL)	STARTING VOLUME (MM BBL) ⁵	IMPLIED DAYS OF NET IMPORT COVER BASED ON TTM NET IMPORTS THROUGH 6/2017 ⁶
2016	--	--	--	--	--	--	--	--	695.1	210.9
2017	--	--	-6.4	-10	--	--	--	-16.4	695.1	210.9
2018	-5	--	-7	-9	--	--	--	-21	669.0	203.0
2019	-5	--	-4.7	-6	--	--	--	-15.7	667.0	199.3
2020	-5	--	-12.3	--	--	--	5	-12.3	641.3	194.6
2021	-5	--	--	--	--	--	-5	-10	619.0	187.8
2022	-8	--	--	--	--	-7.5	--	-15.5	609.0	184.8
2023	-10	-16	--	--	--	-7.5	--	-33.5	593.5	180.3
2024	-10	-25	--	--	--	-7.5	--	-42.5	560.0	169.9
2025	-10	-25	--	--	--	-7.5	--	-42.5	517.5	157.0
2026	--	--	--	--	-3.5	-35	--	-38.5	475.0	144.1
2027	--	--	--	--	-3.5	-35	--	-38.5	436.5	132.4
2028*	--	--	--	--	--	--	--	--	398.0	120.7
All Years	-58	-66	-30.4	-25	-7	-100	-10	-296.4		

Notes:

¹ Based on \$2 B of total modernization spending. Incorporates pending \$350 MM modernization sale in FY2019 at \$75/bbl and the balance of the \$2 B at \$75/bbl in FY2020. Section 404 of the 2015 Bipartisan Budget Act does not require all \$2 B in sales, so this represents an upper-bound assumption. President Trump's FY 2018 Budget Request to Congress proposed to reduce overall modernization spending to \$1B. The President's FY 2019 Budget Request indicated that the \$1.2 B Marine Terminal Distribution Capability Enhancements program outlined in the Long-Term Strategic Review had been deferred and would be re-evaluated pending final policy guidance.

² Ratably applied to FY 2026 and 2027.

³ First 30 MM bbl ratably applied to FY 2022-2025.

⁴ Ratably applied to FY 2020 and 2021.

⁵ FY 2016-2018 values reflect actual levels in October of prior calendar year. FY 2019 excludes pending repurchases from emergency sales and uses April 2018 SPR volumes, less the 7 MM bbl in the March 2018 modernization sale.

⁶ Based on TTM average net crude and products imports of 3.296 MM bbl/d through April 2018.

Source: ClearView Energy Partners, LLC, using DOE, EIA and Library of Congress data.

As Figure 1 shows, if current statutory requirements remain unchanged, scheduled modernization and non-emergency sales could reduce SPR crude volumes to ~398 MM bbl at the start of U.S. Government FY 2028. This would represent a ~296.4 MM bbl decline from the Reserve's ~695.1 MM bbl size at the start of FY 2017, based on the assumptions outlined in Figure 1. Accordingly, it seems prudent to ask whether, and how, the resulting surplus capacity might be put to productive use.

Key Elements of the Discussion Draft

By my reading, the discussion draft would make three principal changes to the existing text of EPCA. First, it would expand the universe of potential lessees of unused SPR capacity. Section 168(a) of EPCA currently gives the Secretary of Energy authority to store petroleum for foreign governments in “underutilized” SPR facilities:

Notwithstanding any other provisions of this title, the Secretary, by lease or otherwise, for any term and under such other conditions as the Secretary considers necessary or appropriate, may store in underutilized Strategic Petroleum Reserve facilities petroleum product owned by a foreign government or its representative. Petroleum products stored under this section are not part of the Strategic Petroleum Reserve and may be exported without license from the United States.

The discussion draft would modify Section 168(a) by making private-sector entities eligible to store petroleum products in underutilized SPR facilities, as well. It also would redefine eligible infrastructure for leasing to include “storage facilities and related facilities”:

Notwithstanding any other provision of this title, the Secretary may establish and carry out a program to lease underutilized Strategic Petroleum Reserve storage facilities and related facilities to the private sector, or a foreign government or its representative. Petroleum products stored under this section are not part of the Strategic Petroleum Reserve.

Second, the draft would impose new national security requirements on storage for foreign governments by replacing the original text of Section 168(d) with the following:

The Secretary shall ensure that leasing of facilities under the program established under subsection (a) to a foreign government or its representative will not impair national security.

Third, the draft would reallocate proceeds generated by leasing activities. The text in EPCA that is currently designated as Section 168(d) of EPCA reserves leasing revenues for the purpose of purchasing petroleum products:

Funds collected through the leasing of Strategic Petroleum Reserve facilities authorized by subsection (a) after September 30, 2007, shall be used by the Secretary of Energy without further appropriation for the purchase of petroleum products for the Strategic Petroleum Reserve.

A new section 168(e) in the draft would allocate proceeds to the Treasury Department’s General Fund and use them to offset costs associated with withdrawals on behalf of lessees:

(e) DEPOSITS OF AMOUNTS RECEIVED. —
(1) IN GENERAL. — Except as provided in paragraph (2), amounts received through the leasing of facilities under the program established under subsection (a) shall be deposited in the general fund of the Treasury during the fiscal year in which such amounts are received.
(2) COSTS. — The Secretary may use for costs described in subsection (b), without further appropriation, amounts received through the leasing of facilities under the program established under subsection (a).

The “subsection (b)” cost recovery provisions referenced in the excerpt above seem essentially unchanged from EPCA today:

Any lease entered into under the program established under subsection (a) shall contain provisions providing for fees to fully compensate the United States for all related costs of storage and removals of petroleum products (including the proportionate cost of replacement facilities necessitated as a result of any withdrawals) incurred by the United States as a result of such lease.

In addition to those three changes, the discussion draft would create a new EPCA provision. Section 170 would establish within 180 days a pilot leasing program for "capacity for storage of up to 200,000,000 barrels of petroleum products at Strategic Petroleum Reserve storage facilities" and "related facilities." Notably, the pilot would include a requirement to

[...] identify and implement any changes to facilities or facility operations necessary to so lease such facilities, including any such changes necessary to ensure the long-term structural viability and use of the facilities for purposes of this part and part C;

Comments Regarding the Discussion Draft

My comments generally fall into three categories: (1) feasibility; (2) competitiveness; and (3) strategic goals.

Regarding feasibility: in conjunction with the leasing program envisioned by the discussion draft, DOE might wish to evaluate the viability of underutilized SPR capacity and the potential cost associated with restoring, rehabilitating or improving that capacity to support the requirements of commercial lessees. Notably, the DOE's *Long-Term Strategic Review* described "single-cycle drawdown" caverns characterized by "irregular cavern shapes, shallow depths, and spacing between caverns" with "geo-mechanical and structural challenges that make them unsuitable for conducting multiple drawdowns." The *Review* stated that ~142.1 MM bbl of design storage capacity had only one drawdown left at the time, and that ~129.7 MM bbl of that total consisted of single-cycle drawdown caverns (Bayou Choctaw 101, which could be rehabilitated, accounted for the remaining 12.4 MM bbl).

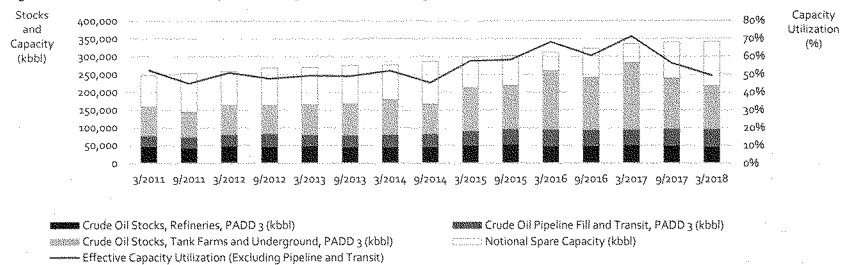
Likewise, DOE might also wish to evaluate the availability of takeaway capacity from leased storage sites, particularly in the absence of incremental SPR marine distribution capacity buildout. The *Review* detailed challenges associated with pipeline reversals and growing domestic production that had impaired outflows from Bayou Choctaw:

The surplus of crude in the Capline System and the reversal of the Ho-Ho pipeline make it difficult for Bayou Choctaw SPR crude to make its way into the market without disrupting existing commercial flows of domestic crude. Additionally, there is virtually no capacity to provide incremental barrels of SPR crude by marine vessel at the St. James terminal without disrupting Shell's commercial business.

It also may bear noting that, per my estimate in Figure 1, the full 200 MM bbl of capacity seems unlikely to be available for leasing before the start of U.S. Government FY 2025 (i.e., October 1, 2024).

Regarding competitiveness, it may be useful for DOE to evaluate the market impacts associated with introducing up to 200 MM bbl of crude storage into PADD 3 (the Gulf Coast region). The EIA's semi-annual assays of PADD 3 storage show recent capacity utilization declines, exclusive of pipeline fill (Figure 2).

Figure 2 – EIA Semi-Annual Assays of PADD 3 Commercial Storage, 3/2011 – 3/2018



Note: Capacity utilization and notional spare capacity based on working storage, not shell (i.e., unusable) storage.

Source: ClearView Energy Partners, LLC, using EIA data

Production growth generally increases storage requirements, but SPR leasing seems likely to come with several uncertainties. On one hand, it could be undesirable if additional, low-cost, government-run SPR storage were to “crowd out” existing, privately operated facilities. On the other hand, even though salt cavern storage tends to be significantly cheaper than tank storage and floating storage in leased tankers, drawdown constraints and takeaway bottlenecks could limit commercial demand relative to demand for more readily accessible tank farms and ships.

Ultimately, SPR storage may prove better suited for lessees with long-term storage needs, such as foreign governments that must comply with International Energy Agency (IEA) obligations to hold 90 days of net import cover. According to IEA data through April 2018, nine of the 30 Member countries currently rely to some degree on publicly controlled inventories stored abroad (Figure 3).

Figure 3 – IEA Member Countries: Strategic Stocks Held Overseas and Implied 90-Day Compliance Volumes

INTERNATIONAL ENERGY AGENCY MEMBER	SHARE OF OIL HELD IN PUBLIC STOCKS (%) ¹	SHARE OF INDUSTRY OIL STOCKS HELD ABROAD, AS OF 4/2018 (%) ²	SHARE OF PUBLIC OIL STOCKS HELD ABROAD, AS OF 4/2018 (%)	2018P NET IMPORTS (KBB/D) ³	90 DAYS' NET IMPORT COVER (MM BBL)
Canada ⁴	—	—	—	—	—
Mexico ⁴	—	—	—	—	—
United States	42%	0%	0%	3,296.0 ⁴	237.1
Australia	0%	0%	—	544.2	48.7
Japan	60%	0%	0%	4,338.5	390.5
Korea	51%	0%	0%	2,243.5	201.9
New Zealand	28%	0%	100%	141.2	12.7
Austria	83%	43%	0%	225.3	20.2
Belgium	56%	18%	60%	286.7	25.8
Czech Republic	73%	29%	0%	395.8	37.6
Denmark	38%	2%	11%	7.9	0.7
Estonia	55%	0%	47%	37.5	3.6
Finland	49%	2%	0%	178.7	16.1
France	72%	0%	3%	1,568.5	141.2
Germany	73%	14%	4%	2,179.0	196.1
Greece	0%	0%	—	273.7	24.6
Hungary	61%	0%	0%	109.1	9.8
Ireland	83%	0%	44%	134.2	11.9
Italy	8%	13%	0%	977.3	88.0
Luxembourg	0%	93%	—	57.4	5.2
The Netherlands	25%	0%	55%	888.6	80.0
Norway ⁴	—	—	—	—	—
Poland	27%	0%	0%	516.5	49.2
Portugal	37%	4%	21%	218.1	19.6
Slovak Republic	64%	0%	0%	67.3	6.1
Spain	41%	4%	0%	1,147.4	103.3
Sweden	0%	9%	—	286.7	25.8
Switzerland	0%	5%	—	749.4	72.4
Turkey	0%	0%	—	702.0	63.2
United Kingdom	0%	34%	—	438.9	39.5

Notes:

¹ Based on IEA data for April 2018, accessed on July 21, 2018: <http://www.iea.org/netimports/>.

² Using IEA projections for 2018 (i.e., not actual data) in every case except the U.S., which uses Energy Information Administration (EIA) data for April 2018.

³ Canada, Mexico and Norway are net exporters and, therefore, have no net import cover obligations.

⁴ Uses EIA accessed on July 21, 2018 via the FRED Excel plug-in; reflects trailing, twelve-month (TTM) average through April 2018.

Source: ClearView Energy Partners, LLC, using EIA and IEA data

The Government Accountability Office (GAO) noted in its [May 30 report](#), *DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile*, that the U.S. could potentially sell “tickets” (contingent contracts) to other IEA members:

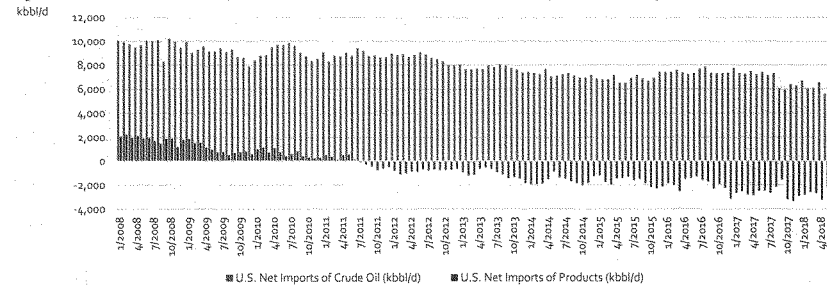
Second, if Congress determines that the SPR holds oil in excess of that needed domestically, DOE could explore selling contracts or tickets for the excess oil rather than selling the oil outright. Australian and New Zealand officials told us that if DOE were to sell tickets for SPR oil, tickets would help these countries meet their IEA 90-day reserve obligations.

In a similar vein, DOE could potentially explore hybrid products within its pilot program, such as the option for commercial customers to purchase SPR crude and pay lease fees to store it in place rather than taking delivery. This sort of virtual transfer could reduce, or at least delay, wear and maintenance requirements associated with drawdowns.

Regarding strategic goals: at a storage cost of \$0.10/bbl/month, 200 MM bbl of capacity would generate annual revenues of \$240 MM/Y, or a little more than two-thirds of the modernization budget in the latest iteration of the FY 2019 energy and water appropriations bill. Even so, the discussion draft as currently written would primarily deposit leasing proceeds into the General Fund rather than paying for SPR modernization and improvements, such as marine delivery expansions that could augment SPR utility in emergencies use while also making commercial storage more attractive.

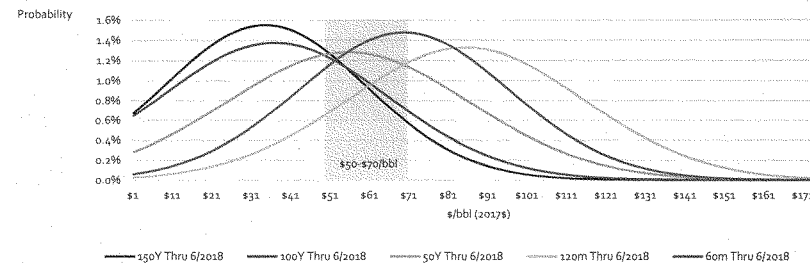
Accordingly, it may be worth exploring whether the pilot leasing program could be designed to allocate a greater share of proceeds towards SPR modernization. The SPR still matters, even though the U.S. has dramatically reduced its net petroleum imports, not least because U.S. refiners still import significant crude volumes at prices that reflect global supply-demand balances (Figure 4).

Figure 4 – U.S. Net Petroleum Imports Have Declined Substantially, but the Country Still Imports Significant Crude Volumes



Despite several recent years of relative calm, oil prices remain high relative to historical norms. Global real crude oil prices averaged higher during the five and ten years through June than they did over 50- 100- and 150-year intervals (Figure 5).

Figure 5 – Historical Mean Global Prices of Crude Oil and Implied Probabilities of Real Global Prices Above \$70/bbl

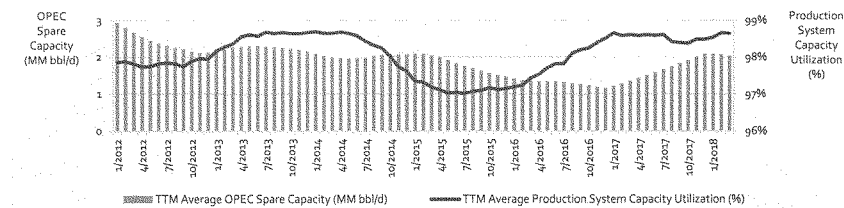


PERIOD	MEAN REAL PRICE (\$/BBL, 2017\$)	STANDARD DEVIATION, ASSUMING NORMALLY DISTRIBUTED PRICES (\$/BBL, 2017\$)	CUMULATIVE PROBABILITY OF A PRICE AT OR ABOVE \$70/BBL
150Y Thru 6/2018	\$34.26	\$35.73	8.3%
100Y Thru 6/2018	\$36.66	\$29.04	12.5%
50Y Thru 6/2018	\$55.33	\$31.18	31.9%
120m Thru 6/2018	\$89.20	\$30.07	69.3%
60m Thru 6/2018	\$69.51	\$27.04	49.3%

Source: ClearView Energy Partners, LLC, using BEA, BP and EIA data

At the same time, even as U.S. crude production surges towards 12 MM bbl/d – and, potentially, net exports within a decade – robust global consumption growth has driven production system capacity utilization (consumption divided by production plus OPEC spare capacity) back up to relatively high levels (Figure 6).

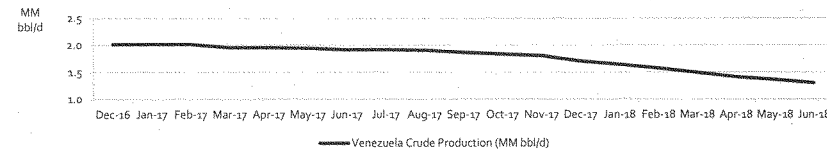
Figure 6 – High Global Crude Production System Capacity Utilization, Low (and Falling) OPEC Spare Capacity



Source: ClearView Energy Partners, LLC, using EIA data

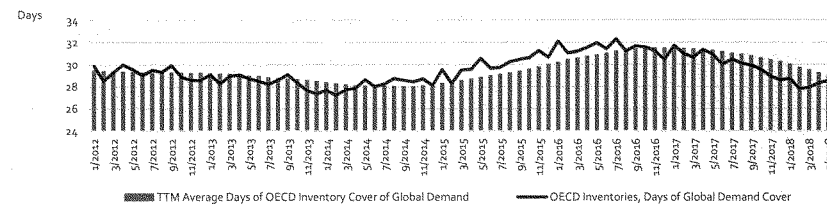
Meanwhile, concerted efforts by OPEC and cooperating countries since the start of 2017 – with a big assist from the collapse of Venezuelan production (Figure 7) – have substantially reduced OECD petroleum inventories (Figure 8).

Figure 7 – Venezuela's Production Fell to ~1.3 MM bbl/d in June 2018, With a TTM Average Downtrend of ~60 kbb/d/month



Source: ClearView Energy Partners, LLC, using Platts OPEC Survey data

Figure 8 – OECD Inventory Demand Cover Has Dropped Significantly

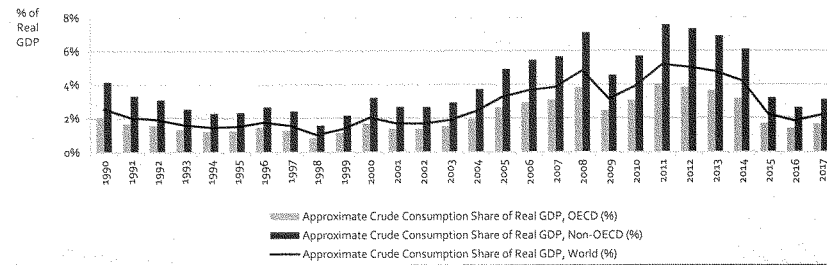


Source: ClearView Energy Partners, LLC, using EIA data

This combination of high upstream capacity utilization and thinning inventories exposes consumers to (painfully) balancing global markets through demand destruction in the event of a shortfall.

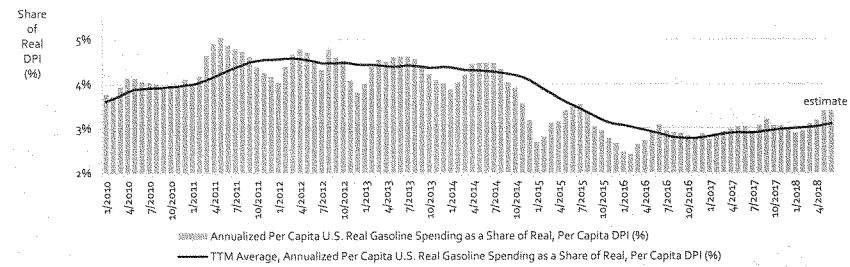
Given its potential to disrupt and undercut private investments, an SPR draw seems unwarranted in anything less than a severe and potentially sustained supply interruption. That said, the strategic goals of insuring against worldwide economic fallout (Figure 9) and sheltering U.S. consumers (Figure 10) seem likely to require a robust and well-functioning Reserve capable of delivering its full ~4.5 MM bbl/d design capacity. In that spirit, a pilot storage leasing program that helps to preserve and/or expand SPR capabilities could potentially benefit U.S. producers and refiners in need of additional storage at the same time that it enhances petroleum supply insurance for U.S. consumers.

Figure 9 – Global Prices Have Global Implications: Approximate Crude Consumption Shares of Real GDP, 1990-2017



Source: ClearView Energy Partners, LLC, using BEA, BP, EIA and World Bank data

Figure 10 – Even With Surging Crude Production, the U.S. Remains a Nation of Light-Duty Vehicle Drivers



Source: ClearView Energy Partners, LLC, using BEA, EIA and FHWA data

Mr. Chairman, this concludes my prepared testimony. I will look forward to answering any questions you or your colleagues may have at the appropriate time.

Mr. OLSON. Thank you, Mr. Book, and thank you, all our witnesses.

I will now move into the Q and A portion of the hearing. I will begin the questioning. I recognize myself for 5 minutes.

First of all, again, welcome to our three experts. A special welcome to Mr. Evans. Fluor Enterprise—big tall building, one street light up from my official office area—Sugarland, Texas. So welcome, welcome, welcome, dear friend.

My first question is for you, Mr. Book. As a point on the first panel, Texas oil production is booming. I won't brag, but right now we are moving a lot of light crude to the coast about as fast as we possibly can.

If the SPR were open to lease by the industry, do you think, first of all, number one, there would be interest? Number two, would there be value as a holding location for more oil or would the benefits be in the uncertainties going forward with leasing this great asset we have, the SPR?

Mr. BOOK. Congressman, I think bragging is appropriate and you should be proud. That crude is going to keep going to coast, as you say, and exported to global markets that can use it for value.

I think Secretary Winberg was wise to suggest that an inquiry of commercial interest would be a good place to start. One of the issues that you have right now is that you do have storage building at export and transit sites in the Gulf Coast and its building quite rapidly.

The SPR could serve a different purpose for long-term storage today. But as the other witnesses have mentioned, it would require adaptation to be potentially useful for the kinds of commercial applications that different kinds of customers might use.

But definitely there's going to need to be more storage if you in Texas keep producing more crude.

Mr. OLSON. Count on it, guaranteed.

Second question is for you, Mr. Rusco. As you know, the DOE has taken some steps in modernizing the SPR. However, much work still remains and at the moment the SPR seems to lack a clear end goal.

Can you talk about the most important steps DOE has taken—what you think the best pathway forward to them to get this thing up and running to modernize?

Mr. RUSCO. I am encouraged that the Assistant Secretary was talking about testing the market and going out and trying to figure out what the market is and also that is cognizant of the differences in a way that different entities might use excess capacity.

So it's our cost of storing fuel—oil in the ground is much lower than most IEA members' costs and there are members that would like to store oil in our reserves. So that may be ultimately the best way. But you got to test the market to know. I am encouraged about that.

What I am concerned about is DOE has not done a good job of periodically assessing how the market has changed, how energy security issues have changed, and doing complex risk-based analysis involving scenarios of possible use. That's what they need to do.

Mr. OLSON. Thank you. Mr. Winberg is right over your left shoulder. So message accepted and sent. Thank you so much.

Final questions for you, Mr. Evans, of Fluor. The SPR sites are made for long-term storage. But we certainly have a lot of maintenance issues.

Fluor has been maintained as this asset for over almost two decades, as you said. Can you please tell me about the most common cause of maintenance issues and whether the DOE or the private sector can be better suited to fix these problems as quickly as possible?

Mr. EVANS. So the most common maintenance issues that we face today are with regards to the equipment that was not placed during Life Extension One. That was the '91 to '95 timeframe.

We have a lot of piping valves, actuators, and those kinds of pieces of equipment that are 40 years old. We did have a rupture in a low-pressure fresh water system at the Big Hill that was a dramatic one and that's our second significant rupture there.

We find more and more common leaks and we are able to deal with them very quickly. But Life Extension Two, and if it's smartly coupled with a concept to commercialize could replace and deal with, those highest level of common kinds of maintenance risks.

We also have a very old degasification plant that's on its last legs at the West Hackberry Louisiana site. Part of LE2 then is to recycle that and come in with a new much more modular modern design that will be more efficient to make sure that we can deliver crude oil even during difficult hot months—the end of the pipeline system.

Mr. OLSON. Thank you, Mr. Evans.

My time has expired.

Now the chair calls on the ranking member of the subcommittee, Mr. Rush, for 5 minutes.

Mr. RUSH. I want to thank you, Mr. Chairman.

I want to ask each witness if you would give me feedback on this draft legislation.

Do you feel that there is a need for the draft or do you find it helpful or are you concerned about any of the unintentional consequences? And I would like to just ask each one of you if you would respond to the question, and beginning with you, Mr. Rusco.

Mr. RUSCO. I think that the draft legislation addresses an important issue that DOE had not been thinking about when they planned their modernization and that is that there is going to be excess capacity.

And it makes good sense to try to use that capacity in a way that can help pay for the modernization and pay for the routine operations and maintenance so that we don't end up 10, 20 years later with a bunch of deferred maintenance and depreciated usefulness of the assets.

Mr. EVANS. Mr. Rush, we at Fluor are here to implement these at the pleasure of the Congress and the department. We certainly would be responsive in the near term to integrating immediate team needs to, as I mentioned earlier, go the market to understand what market demands are, to perform engineering and operations analysis studies that would take a look at what we needed to do to operate under market conditions.

Number three, see how to fully integrate those with Life Extension Two so we can take advantage of the significant change in in-

vestment that Congress is making in the SPR, and then do all the environmental studies necessary as well to make sure that that operates as integrate smart hole.

I do think that, with the addition of things like brine caverns that were mentioned earlier by Secretary Winberg, those would be very beneficial for overall operation in the long run for the SPR for the government as well as for commercial customers.

Mr. RUSH. Mr. Book.

Mr. BOOK. Congressman Rush, I think it's a good idea to make best use of what you have, particularly if you have a way of making money for the taxpayer using an asset owned by the taxpayer. That's always a good idea.

You asked about unintended consequences and I think that Secretary Winberg has already suggested that he wants to take a look at the implications of this. Part of understanding the role of government is understanding the way in which government actions can impact private investment.

It's always a bad idea to lean too heavy with the government on something that where private industries put capital to work. And so if I had any concern it would be that there would be a risk potentially of commercially undercutting existing investments.

But until one looks at it, there's no reason to not proceed with looking into it.

Mr. RUSH. I want to thank each and every one of you.

Mr. Rusco, in your testimony you state that if DOE is authorized to lease unused small storage capacity to the private sector, as this bill would do, this leasing capacity could generate revenue that could help offset the costs of modernization.

Are you confident that DOE will indeed look at this issue and, if not, what are some of the missing opportunities of not examining this particular topic or subject?

Mr. RUSCO. I am confident that DOE will pay attention to what you all do and my concerns are sort of where the bill doesn't specify what to do and DOE has not been very proactive in evaluating the strategic purpose and future on an ongoing basis of the strategic petroleum reserve and, hence, we got to a point where we, clearly, according to a lot of folks in Congress had more oil than we ought to have.

There's going to be a lot of drawdowns. But that was done without a really quality strategic look at the pros and cons of that from DOE.

Mr. RUSH. Well, thank you, Mr. Chairman. I yield back.

Mr. OLSON. Thank you.

The chair now calls upon the one man who knows more about this topic than any single human being in Congress, vice chairman of the full committee, Chairman Joe Barton.

Five minutes, sir.

Mr. BARTON. Well, I am not sure that's true, Mr. Chairman. But if it is true that still doesn't say much.

So well, but it does point out a fact is that there really hasn't been a strategic look at the SPR in a long time and the last three or four Congresses, as our oil production has ramped up in the United States, especially since the repeal of the crude oil export

ban and our ability to lessen our imports, the Congress is using this as a piggy bank and it's not being evaluated.

Let's take oil out of the SPR. This committee—we did it the last Congress—21st Century Cures. We needed some money, we've got jurisdiction over the SPR so we just said we are going to sell some oil and use it. The Budget Committee is using it. The omnibus is and the appropriation process is.

Long story short, under current law, even though it says only the President can make a decision to use the reserve and he has to declare that it's a national emergency, Congress says not withstanding any other law we are going to sell oil for this or that or bacon fat.

And so this draft bill before us says we don't want to change the basic mission statement but we want to add a mission statement. Under current law, you can't use the SPR for storage for private purposes. It's illegal.

And so we decided let's see if maybe the private sector wants to use it. Now, Mr. Book's concerns, we don't want the private sector to be crowded out on storage capacity. I think that's valid. But it's not mandatory. If we don't sell another barrel of oil other than what we've already authorized, we are going to have over 100 million barrels of existing capacity that could be utilized—maybe two—we were authorized up to a billion barrels. But we don't have the current physical capacity but about a little over 700 million.

Let's see if the private sector might want to use that, and this problem of being able to maintain the reserve because it has to be appropriated—we've got to ask the appropriators to appropriate it—and some years they do, some years they don't.

We changed that. We give the specific authority to the secretary. All the money goes into the general fund. But we allow money from rentals fees, so to be used to maintain and improve the reserve without appropriate—and go through the appropriation process. That puts control in this committee in the Energy and Commerce.

So we are trying to fix that problem. I guess I will ask Mr. Book, given the existing market dynamic, would the private sector decide to utilize the reserve to store their own crude oil? What's your bet on that?

Mr. BOOK. Well, if you ask an analyst to take a bet you're probably going to get an analyst answer. It could be right or wrong and I will come up with a new one for you when it's wrong.

But the private sector breaks down into different sets of customers. So you do have folks who are trading oil, and when the future price of oil is higher than the current price of oil, there's an incentive to store.

They're going to want to move oil out of their storage pretty quickly when the market turns around, as it sometimes does. And then you have the government customers that we mentioned and other potential long-term storage customers or longer-term storage customers and we have different needs.

And I think until you ask and see what's on offer out there, it's hard to know. Right now, what you have are mid-stream companies that are building out storage as they're developing transit capabilities, leasing that storage, and coming up with innovative new ways.

Mr. BARTON. But they're having to pay capital costs to build and operate it.

Mr. BOOK. Well, that's right. They do have——

Mr. BARTON. And under this case, you have existing capacity that it's a lease or a rental—I am not sure how we would do it. But there's no upfront cost, except a commitment—probably a time certain commitment.

Mr. BOOK. Yes. The costs of salt cavern storage are generally cheaper than tank storage and certainly cheaper than leasing a ship to store it and then floating storage when things get tight.

So it could be very competitive.

Mr. BARTON. Well, what we are trying to do—Mr. Rush and I—we have an asset that's underutilized. We are going to have excess capacity.

Why not have a new mission statement that allows the private sector but doesn't mandate the private sector? Maybe it'll work. Maybe it won't.

But we are not going to be any worse off than we are and we will probably be better off if the private sector makes a decision to utilize it because it's going to give some funding that's at the discretion of the secretary of energy to improve the facility and I think it's worth a shot.

But there may be other ideas. Anyway, my time has expired.

Mr. OLSON. Thank you. The chair now calls upon the gentleman from California, Mr. McNerney, for 5 minutes, sir.

Mr. MCNERNEY. Well, thank you, Mr. Chairman.

I appreciate Mr. Barton's remarks about this. But I have a question. Sort of a philosophical question. Is leasing capacity to foreign governments or private entities is that going to degrade the capacity—the long-term capacity of the caverns?

Mr. Evans.

Mr. EVANS. I am not an expert in the interests of foreign governments. I think that if appropriately handled that the caverns themselves can remain integral, if we use brine drive to be able to handle those issues and do multiple small drawdowns that we could continue to operate those in the interests of the government, should we wish to terminate agreements with either commercial or foreign countries.

Mr. MCNERNEY. Well, Mr. Rusco, do you believe that the current proposed legislation will give us enough information to provide that guidance to the operating SPRO effectively and not degrading its capability?

Mr. RUSCO. I think that the implementation of this legislation by DOE matters a lot. They would have to implement this in a way where there are controls.

So, for example, if they were to lease this to other IEA members, lease the access capacity to store long-term oil, which I want to say we have the cheapest storage of anybody in the world and we know of at least two countries that have actually contacted DOE about leasing space like this.

If you did that, then you're really enhancing global energy security because you have larger storage of crude oil in exactly the same place that it would be if we owned it all.

Now, if the private sector owns it, then we have smaller capacity here. Other countries have to have their storage capacity somewhere else.

Mr. MCNERNEY. So my question is does the proposed legislation give us and you and the operators the capability to operate it in a way that would be beneficial rather than detrimental to the long-term capacity? Or does it need to be enhanced or improved?

Mr. RUSCO. I think that what I have read, which is just the discussion draft, that there—you could implement this in a way that would give you flexibility to say OK, we want more—if we want more of that capacity for our own storage, then when a contract is terminated you could take it back and use it as U.S. storage. So I believe it would have that flexibility.

Mr. MCNERNEY. OK. Thank you.

Again, Mr. Rusco, do you think there's a good enough case for product reserve capacity in the western part of the country—on the West coast where we have earthquakes?

Mr. RUSCO. We looked at studies that were done by DOE and those studies came to the conclusion that in the case of the Southeast and the West Coast there were net positive benefits to these things.

DOE chose not to release those reports. They say they're not complete. They've chosen not to complete those reports. But everything that is in those reports indicates that there are net positive benefits to that.

Mr. MCNERNEY. Thank you.

Mr. Evans, you talked a little bit about co-mingling and the inevitability of co-mingling, and refineries are specialized in terms of the kind of oil they take.

How is the co-mingling going to impact the refineries' ability to produce gasoline and other products?

Mr. EVANS. It's a great question. Each particular demand would be somewhat different, Congressman.

But, however, if we were to lease to a, say, a shell or a commercial entity, the crude oil that would be stored there in their own cavern, if you would, you would think that it would make sense for them to store the material that they would utilize most effectively in terms of a turnaround of a refinery without product.

So I think the market handles that piece. We'd have to be very careful about co-mingling the crude oil with the government oil, and those are practices that are commonly done—this is not an impossibility.

But we are, for example, very sensitive to a high gas content oil in our reserves. We believe that's very detrimental to the overall safety and quality of the reserves.

So we have to manage that extremely carefully. We think our current regime is a good one in terms of being able to respond to refinery needs on an instant basis and if we were able to add, similarly, to that mix within the right blend level, that that ought to be utilized well as well.

Mr. MCNERNEY. Thank you.

Mr. Chairman, I yield back.

Mr. OLSON. Thank you.

Mr. Doyle, 5 minutes for questions, sir.

Mr. DOYLE. And I thank you to the witnesses today.

Let me just ask all the witnesses—it's been noted I think in Mr. Rusco's testimony that the U.S. will become a net exporter in the late 2020s but then become a net importer again in 2040, 2050s.

So in your opinion, how should the U.S. be prepared for this long-term outlook for the SPRO?

Mr. RUSCO. Our most recent report is not the first time we've recommended to DOE that they do periodic strategic studies of conditions and report to Congress about what they see coming down the pike.

So if we see a situation where our net imports are going to be increasing over the next few decades at some point, DOE should be up here talking to you all and saying we need to rethink our capacity.

Similarly, if they think that risks have either reduced or increased of global supply disruptions or if there's big changes to demand or supply in any other way, all of that stuff needs to be modeled on a regular basis so that they can give you really quality information so you can make good decisions.

Mr. DOYLE. Do you agree with that, Mr. Evans?

Mr. EVANS. I do. I think the market volatility is very significant right now. I am not an expert in global markets. But reading the newspaper leads me to believe that there are a number of scenarios that could be invoked over time and, certainly, a value in having reserves.

Mr. DOYLE. Mr. Book.

Mr. BOOK. I think humility would be the minimum requirement for anyone looking at the global oil market, given how much things have changed over the last 10 years.

Mr. DOYLE. Yes. Thank you.

Mr. Rusco, you mentioned that \$2 billion from the sale of crude oil from the SPRO is authorized for the modernization program.

Has this been implemented, in your opinion, effectively so far and do you have a status update on the use of these funds?

Mr. RUSCO. I don't. I don't have an up to date status. I know that there have been some sales. I think it's \$700 million. But I don't think most of that money or much of that money has actually been spent.

I think that DOE is doing some further analysis before they actually spend that money. But I can't give you much more of an answer. I could give you something for the record.

Mr. DOYLE. OK. Thank you.

Mr. Evans, how safe is the current infrastructure and how is your company prioritizing and planning for long-term safety?

Mr. EVANS. So we are very safety conscious. You will note our last 3 years on the SPR are the safest years that we have seen in the 40-year operation. It's one of Fluor's core values.

We are very sensitive to the infrastructure and the quality of the infrastructure. We run routine programs and investigations that will allow us to take a look at the quality, for example, of the piping and those kinds of things.

In the short term, it's manageable with, for example, the degasification unit it's on its last legs. We are not going to extend that unit. It simply is not feasible and impossible to do that.

When we invest in Life Extension Two, we'll specifically look at those old and perhaps more risky components that need to be removed and to see how we can possibly configure those to be in a more safe and operating environment in the future.

For example, old pipelines that are 40 years old that are underground that are not possible to send a "smart" pig through perhaps we want to reroute those and have a different method to be able to track the quality of what we've done.

So those are all a part of the department's plans in moving forward.

Mr. DOYLE. So tell me, what type of financial investment does Congress as well as the DOE need to make to update and secure the SPRO's infrastructure?

Mr. EVANS. Well, I think the current, roughly, \$1.4 billion is a terrific start in getting the infrastructure where it needs to go. It certainly attacks the high-profile things that we've got in our infrastructure.

However, it will not replace all of the issues. We'll need to have a continual authorization and appropriation for major maintenance projects as they come around because by no means are we able to use the current funding to replace everything that we know that will be coming along in the next 5 to 10 years.

Mr. DOYLE. Do you have any idea what that number looks like, down the road?

Mr. EVANS. I am sorry. I do not, sir. We can take a look at that and get back to you.

Mr. DOYLE. OK.

Thank you, Mr. Chairman. Thank you.

Mr. OLSON. Thank you, Mr. Doyle.

Mr. Tonko, 5 minutes for questions, sir.

Mr. TONKO. Thank you, Mr. Chair, and welcome, gentlemen.

Mr. Rusco, as we have heard this morning, there have been a number of legislative requirements to sell SPRO oil in recent years.

Do you believe that the frequent changes to SPRO's long-term size target have impacted DOE's ability to develop and maintain a modernization plan?

Mr. RUSCO. Well, I think that DOE's modernization plan was made largely without consideration for those sales and now they're adjusting to those sales and doing further analyses.

So I think the modernization plan will also be affected by any legislation that comes out of this Congress about leasing excess capacity. But even if Congress does not mandate that they look into leasing excess capacity, DOE should do something with its excess capacity. They should either tell you that they need to shrink capacity or sell some, for example.

But they need to do something because just leaving that excess capacity there is just throwing money away.

Mr. TONKO. Thank you.

And Mr. Evans, depending on how the leases are structured, might they result in additional stress on aging SPRO infrastructure, requiring greater investments in modernization and improvements that then might otherwise be required?

Mr. EVANS. It is certainly hopeful that—with decisions made on a timely basis to go forward from Congress that we'll be able to in-

tegrate many of the needs for commercialization within the current LE2 environment since there are significant upgrades to pipelines and those kinds of things.

Certainly, we are not currently intending to build brine drive caverns. That's an additional cost that we would incur. There may be other costs associated as well with piping interlinking and valving and control room modifications. Right now, we are not aware of those.

However, I would venture that in the long term those would also benefit the longevity and utilization of the reserve.

Mr. TONKO. Thank you very much.

And this question, I guess, could go to any of the three of you. It's my understanding that the proposed pilot program would allow DOE to recover additional costs from the leases.

How much of the proposed pilot program's revenue should be dedicated to investing in the SPRO modernization?

Mr. EVANS. I don't have a number figure. That's probably better answered to you when we have some more detailed engineering studies and can get back to you on that topic.

Mr. TONKO. Anyone else? Mr. Book, anything?

Mr. BOOK. I am just an analyst, sir.

[Laughter.]

Mr. TONKO. Mr. Rusco, currently, is DOE able to enter into an agreement with a foreign nation to store oil at the SPRO without a change to the statute?

Mr. RUSCO. We believe that's correct, yes.

Mr. TONKO. Thank you.

And Mr. Book, I noticed in your testimony that there are other nations that meet their IEA requirements by holding oil abroad. Are there any reasons why entering into a contract with a foreign government may be preferable?

Mr. BOOK. Well, the long-term nature of government strategic reserves comports with the existing infrastructure capabilities of the SPRO today.

So the customer of first resort would be the customer that requires the least incremental maintenance. For that reason, it might make sense.

Mr. TONKO. Yes. And do you believe that there would be demand from the private sector to lease this space?

Mr. BOOK. Well, it depends an awful lot on what a market test shows—that there is going to be demand for more storage for crude oil in PAD 3 because there's going to be more crude oil production that will need to be stored.

Mr. TONKO. OK. Anyone else have ideas on that?

Mr. RUSCO. I am sure there's going to be private interest in this capacity. It's the cheapest way to store oil.

Now, you have to make changes in the way that you put it in, take it out. You have to use the brine drive to do that. But it's still going to be cheaper.

Mr. TONKO. Right.

Mr. Evans, did you want to comment on that?

Mr. EVANS. We would also agree with Mr. Book that it would be simplest, most efficacious and, perhaps, quickest to be able to lease

whole caverns to foreign governments as an instantaneous benefit to them and to the U.S. government as well.

Mr. TONKO. Thank you. Thank you, gentlemen, and thank you, Mr. Chair.

I yield back.

Mr. OLSON. Thank you, and the chair now calls upon the ranking member, Mr. Rush, for one additional question.

Mr. RUSH. Mr. Tonko opened up some thoughts and I just want to ask—we've been talking a lot this morning about private interests and I don't think we've been hearing enough thought and consideration to foreign governments.

Are any of you aware of any interests by foreign governments in leasing the underutilized storage space here in the U.S. and if you want to—what's the potential for—

Mr. RUSCO. We spoke with representatives from Australia and New Zealand, both of whom have an interest in leasing oil and space in the SPRO, and they have actually spoken with DOE about this in the past.

Mr. RUSH. Just those two nations?

Mr. RUSCO. Yes, but I—

Mr. RUSH. Do you see any potential for other similarly situated foreign governments?

Mr. RUSCO. I would be surprised if there are no other governments that are interested because of the differential cost. A lot of countries are storing oil and product in tanks and if you can store oil in a salt dome it's much cheaper, and so I would assume that there would be additional interest.

Mr. RUSH. Thank you, Mr. Chairman. I yield back.

Mr. OLSON. Thank you, and seeing no further members wishing to ask questions, I would like to thank our witnesses for coming today, and before you leave, Mr. Evans, one special tie we have together, we have the Fluor tie but I just found out my dad was a Fighting Siwash. Knox College played football there '56 through '60.

Mr. EVANS. Are you kidding me? That is absolutely amazing, Mr. Olson.

Mr. OLSON. No prairie fire. Siwash, Siwash, Siwash.

Mr. EVANS. When I was at Knox, which is a terrific institution, we were the Fighting Siwash and I've never, fortunately, given that up. That's so amazing.

Mr. OLSON. Mr. Rush knows that's in Galesburg, Illinois—Knox College.

Mr. EVANS. Galesburg. Grew up in Illinois and went to school there and my family has lived there since the 1850s. So Knox is a terrific institution. Thank you for that.

Mr. OLSON. Yes, sir. Yes, sir.

And before we conclude, I ask unanimous consent to submit the following documents to the record: a report by GAO and a report from the Center on Global Energy Policy*.

[The information appears at the conclusion of the hearing.]

*The information has been retained in committee files and can be found at: <https://docs.house.gov/meetings/IF/IF03/20180724/108593/HHRG-115-IF03-20180724-SD013.pdf>.

And pursuant to committee rules, I remind members that they have 10 business days to submit additional questions for the record and I ask that the witnesses submit their responses within 10 business days upon receipt.

Without objection, this subcommittee is adjourned.

Go Siwash.

[Whereupon, at 12:35 p.m., the committee was adjourned.]

[Material submitted for inclusion in the record follows:]



United States Government Accountability Office

Report to Congressional Requesters

May 2018

STRATEGIC PETROLEUM RESERVE

DOE Needs to
Strengthen Its
Approach to Planning
the Future of the
Emergency Stockpile

GAO-18-477

GAO Highlights

Highlights of GAO-18-477, a report to Congressional Requesters

Why GAO Did This Study

More than 4 decades ago, Congress authorized the creation of the SPR to reduce the impact of disruptions in supplies of petroleum products. DOE manages the SPR. As a member of the International Energy Agency, the United States is obligated to maintain reserves equivalent to at least 90 days of the previous year's net imports (imports minus exports). The SPR's storage and related infrastructure is aging, and DOE has plans to modernize these facilities. Since 2015, Congress has mandated crude oil sales. As of March 2018, the SPR held about 665 million barrels of crude oil.

GAO was asked to examine the SPR's ability to meet U.S. energy security needs. This report examines, among other things, the extent to which (1) DOE has identified the optimal size of the SPR, and (2) DOE's plans for modernizing the SPR take into account the effects of congressionally mandated crude oil sales. GAO reviewed DOE's plans and studies, and interviewed agency officials and nine experts selected based on prior work, referrals, and a literature review.

What GAO Recommends

GAO is making four recommendations, including that DOE (1) supplement the 2016 review by conducting an additional analysis, (2) ensure that the agency periodically reexamines the size of the SPR, and (3) consider a full range of options for handling potentially excess assets as it conducts its study, among other things. DOE agreed with two, partially agreed with one, and disagreed with another recommendation on refined product reserve studies. GAO maintains that the recommendations are valid.

View GAO-18-477. For more information, contact Frank Rusco at (202) 512-3841 or ruscof@gao.gov.

May 2018

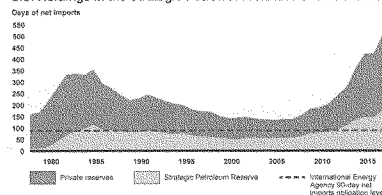
STRATEGIC PETROLEUM RESERVE

DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile

What GAO Found

The Department of Energy (DOE) has not identified the optimal size of the Strategic Petroleum Reserve (SPR). In 2016, DOE completed a long-term strategic review of the SPR after its last comprehensive examination conducted in 2005. The 2016 review examined the benefits of several SPR sizes, but it did not identify an optimal size and its review was limited in several ways. In particular, DOE did not fully consider recent and expected future changes in market conditions, such as the implications of falling net imports, or the role that increased levels of private reserves (reserves held by private companies for their own purposes) may play in responding to supply disruptions. These changes have contributed to SPR and private reserves reaching historically high levels on a net imports basis (see figure). These changes are expected to continue to evolve—according to government projections, the United States will become a net exporter in the late 2020s before again becoming a net importer between 2040 and 2050. GAO has found that agencies should reexamine their programs if conditions change. Without addressing the limitations of its 2016 review and periodically performing reexaminations in the future, DOE cannot be assured that the SPR will be sized appropriately into the future.

U.S. Holdings in the Strategic Petroleum Reserve and Private Reserves, 1977-2017



Source: GAO analysis of U.S. Energy Information Administration (EIA) data. | GAO-18-477

DOE has taken steps to take into account congressionally mandated sales of SPR crude oil in its \$1.4 billion modernization plans for SPR's infrastructure and facilities. The SPR is projected to hold 405 million barrels of oil by the end of fiscal year 2027. However, DOE's current plans are based on information analyzed prior to recently mandated sales. According to DOE officials, the agency began a study in March 2018 to assess the effects of these sales on the SPR's modernization. However, this study is not examining all options for handling any excess SPR assets that may be created by currently mandated sales or any additional sales that may be mandated in the future, inconsistent with an agency order on real property asset management that calls for identifying excess assets. For example, DOE does not plan to examine the potential to lease unused SPR storage capacity to the private sector because DOE is not currently authorized to enter into such leases, according to agency officials. If authorized, leasing capacity could generate revenues that could help offset the costs of modernization. By not examining a full range of options, DOE risks missing beneficial ways to modernize the SPR while saving taxpayer resources.

United States Government Accountability Office

Contents

Letter		1
	Background	8
	In Contrast with the United States, Most IEA Members Rely on Private Reserves to Meet Reserve Obligations and Hold Significant Proportions of Their Reserves as Petroleum Products	14
	DOE Has Not Identified the Optimal Size for the SPR or the Potential Need for Regional Product Reserves	17
	DOE Has Taken Steps to Update Its Modernization Plans, But Is Hindered by Uncertainty Regarding the SPR's Long-term Size	25
	Conclusions	30
	Matter for Congressional Consideration	32
	Recommendations for Executive Action	32
	Agency Comments and Our Evaluation	33
Appendix I	Comments from the Department of Energy	36
Appendix II	GAO Contact and Staff Acknowledgments	41
Figures		
	Figure 1: Strategic Petroleum Reserve, Big Hill Site – Raw Water Pipe Failure in April 2016	11
	Figure 2: U.S. Holdings in the Strategic Petroleum Reserve and Private Reserves, 1977-2017	15
	Figure 3: U.S. Strategic Petroleum Reserve Locations and Regional Petroleum Product Supply Vulnerabilities Identified by the Department of Energy in 2014	22
	Figure 4: Oil Inventory Held in the Strategic Petroleum Reserve in 2017 and Projected Oil Inventory in 2027 Compared to the Reserve's Design Capacity in 2017	27

Abbreviations

DOE	Department of Energy
EIA	Energy Information Administration
IEA	International Energy Agency
SPR	Strategic Petroleum Reserve

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



U.S. GOVERNMENT ACCOUNTABILITY OFFICE

441 G St. N.W.
Washington, DC 20548

May 30, 2018

The Honorable Lisa Murkowski
Chairman
The Honorable Maria Cantwell
Ranking Member
Committee on Energy and Natural Resources
United States Senate

The Honorable Lamar Alexander
Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate

The Honorable Greg Walden
Chairman
The Honorable Frank Pallone, Jr.
Ranking Member
Committee on Energy and Commerce
House of Representatives

The Honorable Fred Upton
House of Representatives

More than 4 decades ago, Congress authorized the creation of the Strategic Petroleum Reserve (SPR)—currently the world's largest government-owned stockpile of emergency crude oil—to reduce the impact of disruptions in supplies of petroleum products.¹ The reserve is managed by the Department of Energy (DOE) and as of March 2018 held 665.5 million barrels of crude oil, worth about \$42 billion.² In the decades since its creation, the structure of the SPR generally has not changed—it has always held crude oil in salt caverns along the Gulf Coast—though markets for crude oil and petroleum products—products such as gasoline and diesel that are refined from crude oil for final consumption—have

¹Energy Policy and Conservation Act, Pub. L. No. 94-163, §§ 151(b), 154(a), 89 Stat. 871, 881-882 (1975) (codified as amended at 42 U.S.C. §§ 6231(b), 6234(a)).

²This calculation is based on average market oil prices as of March 2018 of about \$63 per barrel, the price of West Texas Intermediate, which is a domestic oil used as a benchmark for pricing.

changed significantly. Throughout most of the SPR's history, domestic crude oil production was generally in decline while consumption of petroleum products was generally increasing, causing the United States to rely increasingly on imported crude oil and petroleum products. However, the SPR now operates in a context of increasing U.S. crude oil production (the United States is now one of the world's largest crude oil producers), relatively stable consumption, and shrinking net crude oil and petroleum product imports. Moreover, whereas the Arab oil embargo of 1973-1974 led to shortages and long lines at gas pumps around the country, prices now change to accommodate supply and demand so that physical crude oil shortages are less of a concern than they were in the 1970s when the SPR was created. Meanwhile, as we reported in 2017, the SPR has primarily been used in response to domestic supply disruptions, such as those caused by hurricanes. However, the SPR has been limited in this role because it is almost entirely composed of crude oil and not petroleum products such as gasoline.³ As a result, the SPR may not be effective at mitigating the effects of petroleum product disruptions such as those that have occurred when hurricanes knocked out petroleum product refineries or distribution infrastructure. Members of Congress and others have raised questions about the appropriate size of the SPR as well as the effectiveness of its current storage and delivery infrastructure in meeting the nation's evolving energy security needs.

According to DOE's 2014-2018 strategic plan, the SPR benefits the nation by providing an insurance policy against actual and potential interruptions in crude oil or petroleum product supplies caused by international turmoil, hurricanes, accidents, or terrorist activities.⁴ Releasing SPR crude oil during a supply disruption is intended to mitigate damage to the economy by replacing disrupted crude oil supplies, thereby reducing price increases that can result in economic damage.

In addition to helping the United States meet its domestic energy security needs, the SPR also helps the United States meet its obligations as a member of the International Energy Agency (IEA)—an international energy forum of 30 member countries established in 1974 to help

³GAO, *Strategic Petroleum Reserve: Preliminary Observations on the Emergency Oil Stockpile*, GAO-18-209T (Washington, D.C.: Nov. 2, 2017).

⁴U.S. Department of Energy, *U.S. Department of Energy Strategic Plan 2014-2018*, March 2014.

members respond collectively to major energy supply disruptions.⁵ Crude oil and petroleum product markets are global. Therefore, while a release of crude oil or petroleum products from any country during a supply disruption can have global benefits, the ability of any individual country to significantly affect these global markets is limited. To become a member of the IEA, a country must have, among other things, crude oil or petroleum product reserves equivalent to 90 days of the previous year's net imports and measures in place to ensure it is able to contribute its share of a collective action initiated in response to a significant global oil supply disruption. The IEA first established this 90-day minimum reserve obligation in 1974. The IEA counts both public and private reserves towards meeting the 90-day reserve obligation, although the United States has recently met this obligation solely through publicly owned reserves in the SPR.⁶

Since 2015, six laws required sales of crude oil from the SPR to fund the modernization of SPR facilities and other national priorities.⁷ Total

⁵The 30 member countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Mexico, The Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States.

⁶Public reserves are owned by the government or an independent organization set up by the government, known as an agency. Private reserves, also called industry reserves, are oil or petroleum products held by industry for commercial and operational purposes as well as oil or petroleum products held by industry to meet minimum national reserve requirements.

⁷Specifically, the Bipartisan Budget Act of 2015 provided for the drawdown and sale of a total of 58 million barrels of crude oil from fiscal years 2018 through 2025 and authorized the sale of up to \$2 billion worth of oil, with the proceeds to be deposited in an Energy Security and Infrastructure Modernization Fund, the purpose of which is to provide for the construction, maintenance, repair, and replacement of SPR facilities. Pub. L. No. 114-74, §§ 403, 404, 129 Stat. 584, 589 (2015). The Fixing America's Surface Transportation Act provided for the drawdown and sale of a total of 66 million barrels of crude oil from fiscal years 2023 through 2025. Pub. L. No. 114-94, § 32204, 129 Stat. 1311, 1740 (2015). The 21st Century Cures Act provided for the drawdown and sale of a total of 25 million barrels from fiscal years 2017 through 2019. Pub. L. No. 114-255, § 5010, 130 Stat. 1033, 1197 (2015). The Tax Cuts and Jobs Act provided for the drawdown and sale of 7 million barrels of crude oil from fiscal years 2026 through 2027. Pub. L. No. 115-97, § 20003 (2017). The Bipartisan Budget Act of 2018 provided for the drawdown and sale of a total of 100 million barrels of crude oil from fiscal years 2022 through 2027. Pub. L. No. 115-123, § 30204 (2018). The Consolidated Appropriations Act of 2018 provided for the drawdown and sale of 10 million barrels of crude oil from fiscal years 2020 through 2021. Pub. L. No. 115-141, Div. O, § 501 (2018). The mandated drawdowns are not to be conducted if they would limit the authority to sell petroleum products for emergency protection in the full authorized quantity. See 42 U.S.C. § 6241(h).

planned sales are projected to reduce the SPR from 665.5 million barrels of crude oil in March 2018 to 405 million barrels by the end of fiscal year 2027.⁸ These sales have an estimated value of almost \$16 billion, according to Congressional Budget Office documents. Of this estimated value, sales of up to \$2 billion were specifically authorized for the SPR's modernization program. The SPR's infrastructure of facilities, pipelines, pumps, and other equipment is aging and much of it needs replacement, according to DOE documents. Since 2014, DOE has developed plans for modernizing the SPR to address these needs, among other things.

You asked us to examine the SPR's ability to meet U.S. energy security needs and IEA obligations. This report examines (1) how the United States and other IEA members meet their IEA 90-day reserve obligation and their obligation to release those reserves in response to a supply disruption, (2) the extent to which DOE has identified the optimal size and the potential need for additional petroleum product reserves for the SPR to meet the United States' international obligations and energy security needs, and (3) the extent to which DOE's plans for modernizing the SPR take into account the effects of current and potential future congressionally mandated oil sales.

To conduct this work, we reviewed reports and studies that we identified through DOE officials, recommendations by experts and stakeholders, and sources referenced in DOE publications. We also identified studies through searching literature databases, including ProQuest, Web of Science, and SciSearch. Our review included studies by DOE, the U.S. Energy Information Administration (EIA),⁹ and IEA. We interviewed DOE

⁸According to the U.S. Energy Information Administration, volumes of oil sold under the Bipartisan Budget Act of 2015, worth up to the \$2 billion authorized for an SPR modernization program are estimated. The estimated volume of oil is derived from oil sold in fiscal years 2017 and 2018 and forthcoming sales in fiscal years 2019 and 2020, according to DOE.

⁹EIA is a statistical agency within DOE that collects, analyzes, and disseminates independent information on energy issues.

officials and reviewed our prior work on the SPR.¹⁰ We also interviewed nine experts and four stakeholders.¹¹ We identified potential experts and stakeholders through related GAO reports, recommendations from government agency officials and other experts, and a literature review. We selected experts who represent sectors and areas of expertise including academia, government, energy economics, energy security, and energy policy. We selected stakeholders who represent a for-profit oil company, energy consulting groups, and a state agency. Generally, we asked experts and stakeholders for opinions on the size and configuration of the SPR, the SPR's mission, and other options to provide U.S. energy security. We conducted an analysis to identify areas of agreement and disagreement. Results are not generalizable but provide examples of a range of views.

To compare how the United States and other countries meet their IEA obligations, we interviewed IEA officials about reserve systems and IEA obligations. To provide examples, we examined reserve structures in six countries—Czech Republic, France, Germany, Ireland, Japan, and the United Kingdom. We selected these countries to ensure representation of

¹⁰GAO, *Strategic Petroleum Reserve: Available Oil Can Provide Significant Benefits, but Many Factors Should Influence Future Decisions about Fill, Use, and Expansion*, GAO-06-872 (Washington, D.C.: Aug. 24, 2006); *Strategic Petroleum Reserve: Improving the Cost-Effectiveness of Filling the Reserve*, GAO-08-726T (Washington, D.C.: Apr. 24, 2008); *Strategic Petroleum Reserve: Issues Regarding the Inclusion of Refined Petroleum Products as Part of the Strategic Petroleum Reserve*, GAO-09-695T (Washington, D.C.: May 12, 2009); *Changing Crude Oil Markets: Allowing Exports Could Reduce Consumer Fuel Prices, and the Size of the Strategic Reserves Should Be Reexamined*, GAO-14-807 (Washington, D.C.: Sept. 30, 2014); *Climate Change: Energy Infrastructure Risks and Adaptation Efforts*, GAO-14-74 (Washington, D.C.: Jan. 31, 2014); GAO-18-209T.

¹¹We conducted both semi-structured and exploratory interviews with: Severin Borenstein, University of California, Berkeley; Stephen Brown, University of Nevada, Las Vegas; Adam Sieminski, Center for Strategic and International Studies; Amy Meyers Jaffe, Council on Foreign Relations; Jason Bordoff, Columbia University; and Joseph Aldy, Harvard University. We conducted semi-structured interviews only with: Robert McNally, The Rapidan Group; James Stock, Harvard University; and jointly with Michael Leahy and Rob Schwiers, Chevron Corporation. We conducted exploratory interviews only with: David Goldwyn, Goldwyn Global Strategies; Sarah Ladislav, Center for Strategic and International Studies; Lorne Stockman, Oil Change International; and Gordon Schremp, California Energy Commission.

the different types of reserve structures used by IEA members.¹² We reviewed documents from each country and interviewed officials involved with the administration of their countries' reserves.¹³ Findings from these countries are not generalizable to those we did not review. To examine how the United States historically has met its IEA 90-day reserve obligation, we analyzed EIA data.

To examine the extent to which DOE has identified the optimal size and potential need for additional petroleum product reserves for the SPR, we reviewed DOE studies and interviewed some of the authors of these studies. Specifically, we reviewed DOE's 2016 long-term strategic review of the SPR, as well as studies and analyses conducted as part of the 2016 review.¹⁴ We also estimated days of U.S. net import protection for 2017 and 2027 using DOE's estimates of the SPR's size, IEA data on days of net import protection, and EIA's 2017 Annual Energy Outlook

¹²Based on our review of IEA documentation and interviews with relevant officials, the Czech Republic uses a reserve structure similar to the United States, in which oil reserves are government-owned; France uses a privately run reserve agency to hold reserves, and requires its domestic oil industry to delegate a specific portion of their holdings to this agency; Germany and Ireland each established a separate organization known as an agency to hold reserves; Japan uses a combination of state-owned reserves and obligations on the private industry; and the United Kingdom meets all of its reserve requirements by obligating industry companies to hold reserves.

¹³We interviewed officials from the Czech Republic's Administration of State Material Reserves; the French Ministry of Ecology, Sustainable Development, and Energy; the French stockholding agency, Comité Professionnel des Stocks Stratégiques Pétroliers; the French Association of Petroleum Industry; Germany's Mineralölwirtschaftsverband e.V. (Mineral Oil Economy Association); Ireland's Department of Communications, Climate Action, and Environment; Ireland's National Oil Reserves Agency; the Irish Petroleum Industry Association; Japan Ministry of Economy, Trade, and Industry; Japan Oil, Gas and Metals National Corporation; the United Kingdom's Department of Energy and Climate Change; and the United Kingdom Petroleum Industry Association. We obtained written responses from Germany's stockholding agency, Erdölbevorratungsverband.

¹⁴U.S. Department of Energy, *Long-Term Strategic Review of the U.S. Strategic Petroleum Reserve: Report to Congress (2016 Long-Term Strategic Review)*, (Washington, D.C.: August 2016); U.S. Department of Energy, *Quadrennial Energy Review: Energy Transmission, Storage, and Distribution Infrastructure (Quadrennial Energy Review of 2015)*, April 2015; Leiby, P.N., D.C. Bowman, G.A. Oladosu, R. Uriarte-Martinez, and M. Johnson, *Economic Benefits of Alternative Configurations of the U.S. Strategic Petroleum Reserve*, Oak Ridge National Laboratory (Oak Ridge, TN: July 2016); Beccue, Phillip, and Hillard Huntington, *An Updated Assessment of Oil Market Disruption Risks – Final Report* (Stanford, CA: Feb. 5, 2016). Stanford's Energy Modeling Forum is a structured forum for studying important energy and environmental issues. Participants are leading energy experts and advisors from government, industry, universities, and other research organizations. DOE sponsored an expert panel study by the Stanford Energy Modeling Forum to quantify oil disruption risk.

forecast data on net oil imports. We compared those estimates to the IEA 90-day reserve obligation. To assess the reliability of these data, we reviewed relevant documentation, interviewed officials, and compared the data with similar data published in other sources. We determined these data to be sufficiently reliable for the purposes of our reporting objectives.

To examine the extent to which DOE's modernization plans for the SPR have taken into account the effects of congressionally mandated oil sales, we reviewed documentation on the SPR's modernization, including plans and analysis of alternatives. We also reviewed our best practices for analysis of alternatives,¹⁵ when we examined DOE's analysis of alternatives for the SPR's modernization. We reviewed the Energy Policy and Conservation Act that authorizes the SPR,¹⁶ DOE annual reports on SPR activities, and DOE budget justifications for fiscal years 2017, 2018, and 2019. We interviewed DOE's contractor that maintains SPR sites to obtain views on any challenges in moving forward with modernization plans and meeting congressionally mandated sales. We also interviewed representatives from a private salt cavern company, government officials from two IEA member countries, and a representative from a private company that leases oil (an oil broker) to identify potential alternatives, and views on these alternatives, for using potential excess SPR assets after congressionally mandated sales.¹⁷ We compared DOE's plans for the SPR, including supporting documentation, to the agency's real property asset management order.¹⁸

¹⁵These best practices were published in GAO, *Amphibious Combat Vehicle: Some Acquisition Activities Demonstrate Best Practices; Attainment of Amphibious Capability to Be Determined*, GAO-16-22 (Washington, D.C.: Oct. 28, 2015), and more recently in *Joint Intelligence Analysis Complex: DOD Partially Used Best Practices for Analyzing Alternatives and Should Do So Fully for Future Military Construction Decisions*, GAO-16-853 (Washington, D.C.: Sept. 30, 2016). An earlier version of the best practices was published in GAO, *DOE and NSA Project Management: Analysis of Alternatives Could Be Improved by Incorporating Best Practices*, GAO-15-37 (Washington, DC: Dec. 11, 2014).

¹⁶Pub. L. No. 94-163, § 154(a), 89 Stat. 871, 882 (1975) (codified as amended at 42 U.S.C. § 6234(a)).

¹⁷The government officials we interviewed were from the Australian Department of the Environment and Energy and the New Zealand Ministry of Business, Innovation, and Employment.

¹⁸U.S. Department of Energy, Real Property Asset Management, DOE Order 430.1C (Washington, D.C.: August 2016).

We conducted this performance audit from February 2017 to May 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Changing Petroleum Markets

Oil and petroleum products markets have changed substantially in the years since the establishment of the SPR. Specifically, U.S. domestic crude oil production has generally been increasing, consumption has been relatively stable, and crude oil and petroleum products markets have become increasingly global. Additionally, U.S. crude oil production is projected to rise further in the future, according to EIA and IEA projections, further reversing a decades-long decline. Recent technological improvements have made onshore production from shale formations economically viable, and domestic crude oil production began to rise in about 2008. The combination of increasing production and relatively stable consumption has resulted in declining net crude oil and petroleum products imports, from a high of about 12 million barrels per day in 2005 to fewer than 4 million barrels per day in 2017.

Since these trends are expected to continue, the IEA and EIA both project net U.S. crude oil and petroleum products imports will decline to zero sometime in the late 2020s and the United States will become a net exporter shortly thereafter. Since the IEA 90-day reserve obligation is based on a country's net imports, there is no such obligation for net exporters; therefore, the United States would have no 90-day reserve obligation as long as it is a net exporter, though it would still be obligated to release reserves in response to supply disruptions. Over the longer term, EIA's projections show U.S. net exports peaking in 2037 and the United States again becoming a net importer between 2040 and 2050.

At the time of the Arab oil embargo, price controls in the United States prevented the prices of oil and petroleum products from increasing as much as they otherwise might have, contributing to a physical oil shortage that caused long lines at gasoline stations throughout the United States. In addition, in the 1970s, oil prices were often set in long-term contracts, which meant that prices would not automatically rise in the face of greater

scarcity. This generally reduced incentives for producers to expand production and sales as well as for consumers to reduce consumption in the face of greater scarcity caused by a supply disruption. Now that crude oil and petroleum product markets are global, the prices of these commodities are determined in the world market, primarily on the basis of supply and demand. In the absence of long-term contracted prices or price controls, scarcity from a supply disruption is generally expressed in the form of higher prices, as purchasers are free to bid as high as they are willing to pay to secure oil supply. In a global market, a large enough supply disruption anywhere in the world raises prices everywhere. This creates incentives for producers unaffected by the disruption to increase their production and release existing inventories and for consumers everywhere to reduce consumption in the ways they find most efficient and least disruptive. While it can take time for some of these actions to affect crude oil and petroleum product markets—according to DOE officials, it can take approximately 6 months from when a producer drills an oil well until oil production comes on line—all these actions tend to mitigate the effects of supply disruptions.

Strategic Petroleum Reserve

The Energy Policy and Conservation Act of 1975 authorized the creation of the SPR, partly in response to the Arab oil embargo of 1973-1974 that caused a shortfall in the international oil market.¹⁹ The purposes of the SPR are, among other things, to reduce the impact of disruptions in supplies of petroleum products and to carry out obligations of the United States under the international energy program. Specifically, the 1974 International Energy Program Agreement, a joint strategy and treaty, established the IEA to address oil security issues on an international scale.²⁰ The SPR is owned by the federal government, managed by DOE's Office of Petroleum Reserves, and maintained by Fluor Federal Petroleum Operations LLC.²¹ The SPR stores crude oil in underground salt caverns along the Gulf Coast in Louisiana and Texas. The SPR currently maintains four storage sites—Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry—with a design capacity of 713.5 million barrels.

¹⁹Pub. L. No. 94-163, § 154(a), 89 Stat. 871, 882 (1975) (codified as amended at 42 U.S.C. § 6234(a)).

²⁰Agreement on an International Energy Program, Nov. 18, 1974, 27 U.S.T. 1685.

²¹Fluor Federal Petroleum Operations LLC is the current DOE Management and Operating Contractor for the SPR.

Under conditions prescribed by the Energy Policy and Conservation Act, as amended, the President has discretion to authorize the release of petroleum products from the SPR to minimize significant supply disruptions.²² When oil is released from the SPR, it is distributed through commercial pipelines or on waterborne vessels to refineries, where it is converted into gasoline and other petroleum products, and then transported to distribution centers for sale to the public.

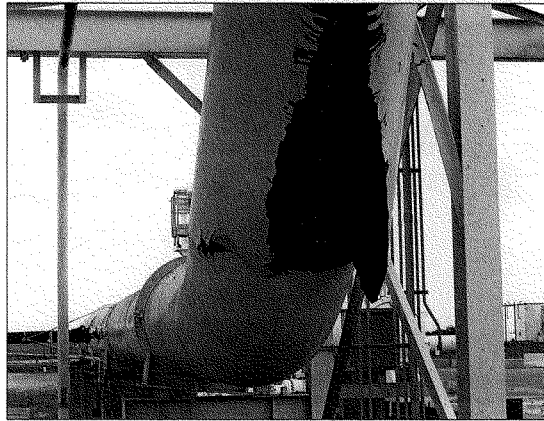
According to DOE documents, well-functioning infrastructure is fundamental to the SPR's ability to maintain operational readiness and meet mission requirements. However, most of the critical infrastructure for moving SPR oil has exceeded its serviceable life, which has led to increasing maintenance costs and decreasing system reliability.²³ Specifically, the reserve relies on a complex system of salt caverns, pipelines, wells, and pumps, with other infrastructure and equipment. Any failures, such as ruptured pipelines, could affect the readiness of a site for an oil release. According to DOE officials, a growing backlog of major maintenance needs raises concerns about the ability of the system to operate as designed. In addition, there have been equipment failures that have rendered parts of the system temporarily inoperable.²⁴ For example, the SPR has experienced at least five major equipment failures since fiscal year 2013, including the Big Hill site pipe failure shown in figure 1.

²²Pub. L. No. 94-163, § 161, 89 Stat. 871, 888 (1975) (codified as amended at 42 U.S.C. § 6241). The statute provides for a drawdown of the reserve upon a finding by the President that drawdown and sale are required by a "severe energy supply interruption," as defined by statute, or by obligations under the international energy program. 42 U.S.C. § 6241(d). Limited drawdowns may be conducted if the President finds that a circumstance is, or is likely to become, a domestic energy supply shortage of significant scope or duration, action taken would assist directly and significantly in preventing or reducing the adverse impact of such shortage, the Secretary of Energy has found that action taken will not impair the ability of the United States to carry out its obligations under the international energy program, and the Secretary of Defense has found that action taken will not impair national security. 42 U.S.C. § 6241(h)(1). Petroleum products may not be drawn down under this authority if there are fewer than 340,000,000 barrels of petroleum product stored in the Reserve, and may not be drawn down below the level of an aggregate of 340,000,000 barrels of petroleum product stored in the Reserve. 42 U.S.C. § 6241(h)(2).

²³According to DOE officials, the SPR has been able to fulfill all of its drawdown requirements and perform its mission in spite of aging infrastructure and equipment failures that have occurred to date.

²⁴According to DOE officials, for pipeline outages, the contractor operating the reserve is required to mitigate outages within 13 days.

Figure 1: Strategic Petroleum Reserve, Big Hill Site – Raw Water Pipe Failure in April 2016



Source: Department of Energy. | GAO-18-477

Click [here](#) to activate a video of this pipe failure at the Big Hill site that resulted in water spillage and needed site repairs.

Regional Petroleum Product Reserves

The United States has two regional petroleum product reserves—the Northeast Home Heating Oil Reserve and the Northeast Gasoline Supply Reserve.

- The Northeast Home Heating Oil Reserve, which is not part of the SPR,²⁵ holds 1 million barrels of ultra low sulfur distillate, a petroleum product essentially equivalent to diesel fuel but that is also used for heating oil. The Northeast United States is heavily dependent on the use of heating oil in winter months.²⁶ The distillate is stored in leased

²⁵The Energy Act of 2000 authorized the establishment of the Northeast Home Heating Oil Reserve, and specifically provided that such a reserve is not a component of the SPR. Pub. L. No. 106-469, § 201(a)(3), 114 Stat. 2029, 2034 (2000) (codified as amended at 42 U.S.C. § 6250(a)).

²⁶The term Northeast, for purposes of the Northeast Home Heating Oil Reserve, is defined as the states of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, and New Jersey. 42 U.S.C. § 6250(b)(1).

commercial tank storage in terminals in Connecticut, Massachusetts, and New Jersey. In 2000, the President directed the creation of the reserve to hold approximately 10 days of inventory, the time required for ships to carry additional heating oil from the Gulf of Mexico to New York Harbor.²⁷

- The Northeast Gasoline Supply Reserve, a part of the SPR, holds 1 million barrels of gasoline for consumers in the northeastern United States. According to DOE's website, this region is particularly vulnerable to gasoline disruptions as a result of hurricanes and other natural events. For example, Hurricane Sandy caused widespread gasoline shortages in the region in 2012. DOE conducted a test sale of the SPR in 2014 and used a portion of the proceeds from the sale to create the reserve. The gasoline is stored in leased commercial tank storage in terminals in Maine, Massachusetts, and New Jersey.

IEA Obligations

The SPR helps the United States meet its IEA obligation to hold the equivalent of 90 days of net imports of crude oil and petroleum products. In order to meet the IEA 90-day reserve obligation, countries, including the United States, can count existing private reserves of crude oil and petroleum products in addition to public reserves (in the United States, the SPR). In most years, the United States has met its 90-day reserve obligation with a combination of SPR and private reserves.²⁸ The days of import protection may vary based on actual net U.S. crude oil and petroleum products imports as well as the inventory levels of the SPR and private reserves. As discussed previously, because the IEA 90-day reserve obligation is based on a country's net imports, there is no such reserve obligation for countries that are net exporters of crude oil and petroleum products.

The United States also relies on the SPR to meet its IEA obligation to release reserves in the event of a collective action to respond to a supply disruption. Countries contribute to an IEA collective action based on their share of IEA oil consumption, and they can meet their obligation by whatever measure they choose, including release of public or private

²⁷Initially, the Northeast Home Heating Oil Reserve held 2 million barrels of high sulfur heating oil. In 2011, the 2 million barrels of high sulfur heating oil was sold and replaced with 1 million barrels of ultra low sulfur distillate.

²⁸In this report, unless otherwise noted, we have calculated the number of days of import protection for the United States by dividing the SPR's inventory level by the EIA's reported net petroleum imports per day for the preceding year.

reserves, or demand restraint. IEA collective actions are designed to mitigate the negative effects of sudden supply shortages by making additional crude oil and petroleum products available to the global market through a combination of emergency response measures, which include increasing supply and reducing demand. In the event of a global market disruption, IEA member countries can call for a collective action after reaching consensus on whether a response is needed. DOE stated that the collective action IEA obligation is more relevant to the SPR's mission of protecting the U.S. economy from severe petroleum supply interruptions than the 90-day reserve obligation. The United States has participated in each of the three IEA collective actions. In 1991, with the commencement of Operation Desert Storm, DOE released 17.3 million barrels of SPR crude oil. After Hurricane Katrina in 2005, DOE released 11 million barrels of SPR crude oil. Most recently, in June 2011, in response to crude oil supply disruptions driven by hostilities in Libya, DOE released 30.6 million barrels of crude oil from the SPR. The Libya collective action is an example of how, in practice, member countries participate according to national circumstances. After consultations with IEA member countries, all IEA member countries agreed to the Libya collective action, under which 12 of the 28 members at that time contributed to the action.²⁹ In addition to the three IEA collective actions, the SPR has been used 10 times in response to U.S. domestic supply disturbances that were not IEA collective actions, most notably in response to severe weather events.³⁰

²⁹At the time of the Libya collective action, there were 28 IEA member countries. Mexico and Estonia have since joined the IEA, which now has 30 members.

³⁰In addition to these releases in response to supply disruptions, the SPR has released oil in relatively small amounts at other times for reasons that include test sales to ensure the system is working.

In Contrast with the United States, Most IEA Members Rely on Private Reserves to Meet Reserve Obligations and Hold Significant Proportions of Their Reserves as Petroleum Products

In terms of how they meet their IEA obligations, most other IEA members differ from the United States in two basic ways. Specifically, as of December 2017, most IEA members rely at least in part on private rather than public reserves to meet their obligations, and most hold significant proportions of these reserves as petroleum products rather than as crude oil.

In December 2017, before Mexico joined the IEA in early 2018, there were 29 member countries. Of these 29 countries, 25 IEA members had two common attributes: (1) as net importers, they had a 90-day reserve obligation and met that obligation,³¹ and (2) they had formal processes for holding and releasing these reserves. As of December 2017, 18 of these 25 members relied entirely or in part on private reserves to meet their reserve obligations.³² Specifically, based on IEA data as of December 2017, these 18 countries met their 90-day reserve obligation through private reserves and either had no public reserves or had public reserves of less than 90 days. According to a 2014 IEA report, some of these countries require industry to hold reserves and, when needed, release them. For example, according to a 2014 IEA report and documentation provided by government officials, the United Kingdom meets its entire obligation by requiring private industry to hold reserves.³³ In contrast, New Zealand had publicly held reserves amounting to 26 days of net imports, according to IEA data as of December 2017. According to a 2014 IEA report, New Zealand relied on industry reserves held for commercial purposes to meet the rest of its 90-day reserve obligation, although New Zealand does not formally require industry to hold reserves specifically for this purpose.

Unlike the 18 countries that rely at least in part on private reserves, as of December 2017, the United States and 6 other IEA members met the 90-day reserve obligation exclusively through public reserves. Specifically, according to IEA data on member reserves, Estonia, Finland, Germany,

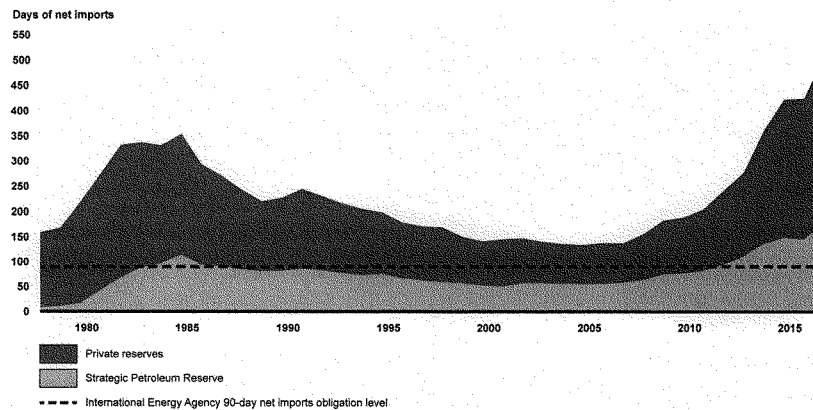
³¹According to IEA documents, as of December 2017, 3 member countries were net exporters and so did not have a 90-day obligation. In addition, according to IEA officials, Australia did not hold the equivalent of 90 days of net imports in December 2017.

³²The 18 member countries are Austria, Belgium, Czech Republic, France, Greece, Italy, Korea, Luxembourg, New Zealand, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, The Netherlands, Turkey, and the United Kingdom.

³³International Energy Agency, *Energy Supply Security, Emergency Response of IEA Countries* (Paris, France: 2014).

Hungary, Ireland, Japan, and the United States held public reserves equal to 90 days or more of net imports.³⁴ Although the United States currently meets its IEA 90-day reserve obligation solely with public reserves, for most of the SPR's existence, public reserves were insufficient to meet this obligation, so the United States also had to rely on private reserves. Specifically, according to EIA data, the United States has relied, at least in part, on private reserves together with the SPR to meet the 90-day reserve obligation with the exception of two time periods (1984-1987 and 2012-present), when the United States has relied solely on the SPR. The United States does not require industry to hold reserves for the purposes of meeting IEA obligations. Figure 2 compares the United States' reserves in days of net imports to the IEA's 90-day reserve obligation.

Figure 2: U.S. Holdings in the Strategic Petroleum Reserve and Private Reserves, 1977-2017



Source: GAO analysis of U.S. Energy Information Administration (EIA) data. | GAO-18-477

³⁴In addition to meeting their 90-day reserve obligation with public reserves, according to country and IEA documentation, Japan and Finland also place requirements on industry to hold some level of reserves.

Crude Oil and Petroleum Product Tickets

Tickets are contingent contracts under which a seller of a ticket agrees to deliver to the buyer an amount of oil or petroleum products if a specific event occurs, such as an IEA collective action, in return for an agreed-upon fee. The agreement specifies the quantity, quality, and location of the oil or product, the duration, and how the price of the physical oil or product will be determined. For example, according to an oil broker, in the event of a disruption, when a buyer executes a ticket contract, the buyer may purchase the oil or petroleum products and pay a price tied to a market index for the oil or product received. Alternatively, according to an oil broker, with the agreement of the seller, the buyer can request that the contracted volumes of crude oil or petroleum products be made available for sale to any willing buyer.

For buyers, tickets provide an alternative to directly acquiring crude oil and petroleum products and building or renting necessary storage capacity. The fees from tickets also create an incentive for sellers to hold additional volumes of oil and product in reserve.

Sources: International Energy Agency and an oil broker. | GAO-18-477

According to a 2014 IEA report, most IEA members hold at least a third of their reserves as petroleum products, such as gasoline and diesel fuel, rather than as crude oil.³⁵ Holding petroleum products can be advantageous during certain disruptions because such reserves can be directly distributed to consumers, whereas crude oil must first be refined and turned into products, adding response time. According to the IEA's 2014 report, Germany's stockholding agency holds 55 percent of its reserve as petroleum products. Similarly, France holds only petroleum products that are distributed geographically across the country so that the reserves can be used quickly in the event of a supply disruption. In contrast, more than 99 percent of the SPR (665.5 million barrels as of March 2018) is held as crude oil, all of which is stored at the four storage sites in Louisiana and Texas. The exception is the Northeast Gasoline Supply Reserve, which, as mentioned previously, is a 1 million barrel gasoline reserve in terminals in Maine, Massachusetts, and New Jersey that was established in 2014 after Hurricane Sandy and that is considered part of the SPR. According to DOE officials, there are several reasons the SPR holds predominantly crude oil, including that it is more costly to store petroleum products than crude oil and that the United States has the largest refining capacity of any IEA member country. Because of the large U.S. refining sector, crude oil from the SPR can be domestically refined into petroleum products to meet demand.

Some IEA member countries store some of their reserves abroad, though the United States does not. According to a 2014 IEA report, some IEA member countries allow part of their reserves to be stored abroad to leverage spare storage capacity or more cost-effective storage by utilizing available storage space or excess private reserves in other countries.³⁶ For example, approximately 30 percent of Ireland's reserves are held in other European Union countries. In some of these cases, countries use short-term contracts, also known as tickets, instead of directly acquiring and storing oil and petroleum products. For example, according to documents provided by government officials, since 1995 the United Kingdom has increased its reserves held under ticket agreements outside of the country from around 10 percent of its total reserves to more than 25 percent.

³⁵International Energy Agency, *Energy Supply Security, Emergency Response of IEA Countries* (Paris, France: 2014).

³⁶International Energy Agency, *Energy Supply Security, Emergency Response of IEA Countries* (Paris, France: 2014).

In addition, unlike the United States, some IEA countries specify the size of their public or private reserves in terms of net imports or consumption, rather than a specific volume. In the United States, the total volume of crude oil and petroleum products held in the SPR is the result of amounts historically purchased to fill the reserve and subsequent sales as mandated by Congress or released in response to a supply disruption. According to DOE, it cannot otherwise reduce or increase volumes held in reserve without congressional action—either through requirements to purchase additional oil or laws authorizing or mandating sales. On the other hand, some IEA countries have tied their reserves' volumes of crude oil and petroleum products to a metric such as days of net imports or a percent of consumption. For example, according to documentation provided by government officials, in 2015 Japan changed how it specifies its target reserves from a specified amount to days of net imports.³⁷ In specifying the size of reserves in this way, the amount held is adjusted as market conditions change—for example, if net imports change and require more or fewer reserves to meet the IEA 90-day reserve obligation, or when other underlying factors affecting a nation's energy security needs change.

DOE Has Not Identified the Optimal Size for the SPR or the Potential Need for Regional Product Reserves

While DOE has examined a range of sizes for the SPR, it has not identified the optimal size for the SPR to meet U.S. energy security needs and IEA obligations, and DOE's analysis of SPR sizes was limited in three ways. DOE also has not identified whether additional regional petroleum product reserves should be part of the SPR in U.S. regions identified as vulnerable to fuel supply disruptions.

³⁷In another example, according to a 2014 IEA report, the United Kingdom and France require industry to hold levels of reserves in days of net imports based on consumption levels.

DOE Examined a Range of Sizes for the SPR but Has Not Identified the Optimal Size for SPR and the Agency's Analysis Was Limited in Three Ways

DOE has not identified the optimal size for the SPR and though the agency examined a range of SPR sizes, its analysis was limited in at least three ways. In response to direction from Congress and recommendations from GAO and the DOE Inspector General, DOE developed and published a long-term strategic review of the SPR in August 2016.³⁸ In DOE's 2016 review, the agency examined the expected economic benefits of SPR sizes ranging from 430 million to 695 million barrels of oil over a 25-year time horizon (2016 through 2040), but it did not recommend an optimal size for the reserve.

DOE's review did not identify the optimal size for the SPR because of three limitations:

- **DOE did not fully evaluate implications of market fluctuations and estimate needs.** DOE did not fully evaluate the implications of falling net imports of crude oil and petroleum products with respect to meeting IEA obligations to hold the equivalent of 90 days of net imports and to respond to collective actions. As mentioned previously, the United States is expected to become a net exporter of crude oil and petroleum products by the late 2020s. Since the IEA 90-day reserve obligation is based on a country's net imports, this means that at that point the United States would not have a 90-day reserve obligation. However, even as a net exporter, the United States would still have to meet the IEA obligation to respond to a collective action. Yet, DOE's analysis did not evaluate the SPR's configuration as it relates to projected fluctuations in net imports or estimate the minimal amount of reserves needed to meet potential future collective actions. Without considering projected fluctuations in net imports or providing

³⁸U.S. Department of Energy, *Long-Term Strategic Review of the U.S. Strategic Petroleum Reserve: Report to Congress*, (Washington, D.C.: August 2016). The Bipartisan Budget Act of 2015 directed the Secretary of Energy to develop and submit to Congress a proposed action plan that, among other things, identifies the configuration and performance capabilities of the SPR and recommends an action plan to achieve the optimal capacity, location, and composition of petroleum products in the SPR. Pub. L. No. 114-74, § 402, 129 Stat. 584, 589 (2015). In September 2014, we reported that changing market conditions have implications for the size, location, and composition of the SPR. We recommended that DOE reexamine the SPR's size. DOE concurred with our recommendation. GAO-14-807. In July 2014, DOE's Office of Inspector General recommended that DOE's Office of Fossil Energy perform a long-range strategic review of the SPR to ensure it is best configured to respond to the current and future needs of the United States and DOE concurred with the recommendation. U.S. Department of Energy, Office of Inspector General, Office of Audits and Inspections, *The Strategic Petroleum Reserve's Drawdown Readiness. DOE/IG-0916* (Washington, D.C.: July 2014).

an analysis of how much oil is estimated to be needed to meet IEA collective actions, DOE cannot fully advise Congress on the optimal size of the SPR.

- **DOE did not consider private-sector response.** DOE's analyses in its 2016 review focused on the publicly held reserves in the SPR as the only means to respond to oil supply disruptions and did not consider a response from the private sector or through consumers reducing demand. According to DOE's 2016 review, the underlying analysis for the benefits of the SPR did not consider a response from the private sector for three reasons: (1) while U.S. commercial stocks could conceivably address part of a supply disruption, private industry could also hold oil inventories in a crisis instead of releasing them; (2) unlike most other IEA member countries, the United States does not require private-sector response; and (3) research on the exact nature of private-sector response during a disruption is needed. DOE officials told us the agency has not studied the extent to which SPR releases of crude oil displace what would otherwise have been private releases of inventories.³⁹

As we reported in September 2014, changing market conditions—most importantly the significant increase in domestic production of oil—have implications for the SPR's size because increased production has led to increasing private reserves.⁴⁰ According to IEA data as of December 2017, U.S. private reserves held the equivalent of 194 days of net import protection coverage, up from about 59 days in 2006. Further, private reserves in the United States consist of both crude oil and petroleum products with more than half in the latter category. For example, as of January 2018, total private reserves of crude oil and petroleum products were about 1.215 billion barrels, of which about 420 million barrels were in the form of crude oil and 795 million barrels were petroleum products, according to the EIA. As of 2013, these private reserves were distributed across the entire country in more than 1,400 terminals, according to the EIA.

As we reported in December 2007, international trade in oil and petroleum products has expanded significantly over the past 2 decades, making markets for gasoline and other petroleum products

³⁹According to DOE officials, the agency adjusted its oil market model to account for the response of U.S. oil production to price changes; the literature is unclear about private-sector behavior, such as whether the private sector would hoard or sell oil inventory when prices rise and as a result, DOE left the role of private sector neutral in its analyses.

⁴⁰GAO-14-807.

increasingly global in nature.⁴¹ In such a global oil market, higher levels of private reserves can benefit the United States and the rest of the world by helping mitigate a supply disruption. Most experts and stakeholders we interviewed generally agreed that the private sector is in a better position to respond to supply disruptions than they were when the SPR was created. With regard to demand response, DOE officials told us they do not consider this because there is no mechanism to require industry to respond to supply disruptions or consumers to reduce demand in response to a supply disruption. However, DOE has not studied how voluntary response to changes in petroleum product prices affects the need for or efficacy of strategic releases. Without conducting an analysis of how private parties respond to supply disruptions, DOE cannot advise Congress on the optimal size of the SPR because it cannot know how effective such private responses could be in mitigating supply disruptions.

- **DOE did not fully examine costs of differently sized reserves.** DOE's review of the expected economic benefits of differently sized reserves did not fully examine the corresponding costs of those sizes. According to DOE officials, there was no requirement or need to conduct a formal cost benefit analysis of the SPR because the SPR's oil acquisition and initial capital costs to create the reserve are sunk costs and the ongoing operational costs to maintain the reserve are minimal in comparison. However, this does not take into account the opportunity cost to the government that holding reserves represents; as Congress has mandated several times recently, crude oil from the reserve can be sold to fund other federal priorities. Without additional analysis, such as of the costs and benefits of SPR's size, DOE cannot fully advise Congress on the optimal size of the SPR.

When we reviewed the SPR in 2006 and 2014, we found that DOE had not periodically re-examined the strategic reserves. In 2006, we recommended that the Secretary of Energy reexamine the appropriate size of the SPR. In its response to our recommendation, DOE stated that its reexamination had taken the form of more "actionable items," including not requesting expansion funding in its 2011 budget and canceling and redirecting the prior year's expansion funding to general operations of the SPR, based on the Administration's decision that the SPR's current size

⁴¹GAO, *Energy Markets: Increasing Globalization of Petroleum Products Markets, Tightening Refining Demand and Supply Balance, and Other Trends Have Implications for U.S. Energy Supply, Prices, and Price Volatility*, GAO-08-14 (Washington, D.C.: Dec. 20, 2007).

at the time was adequate. Similarly, as previously mentioned, in 2014 we found that changing market conditions have implications for the size, location, and composition of the SPR, but DOE had not reexamined the SPR's size since 2005. Accordingly, we recommended that the Secretary of Energy undertake a comprehensive reexamination of the appropriate size of the SPR. In response to our recommendation, the 2014 DOE Inspector General recommendation mentioned previously, and the Bipartisan Budget Act of 2015, DOE published its 2016 review.

As previously mentioned and reported, crude oil and petroleum markets are constantly changing, but DOE conducted its full evaluations of the SPR more than a decade apart. According to DOE officials, there is no formal policy to periodically reevaluate the SPR. We previously found that federal programs should be reexamined if there have been significant changes in the country or the world that relate to the reason for initiating the program.⁴² In that report, we found that many federal programs and policies were designed decades ago to respond to trends and challenges that existed at the time of their creation. Moreover, the Office of Management and Budget Circular A-94 for benefit-cost analysis of federal programs includes guidelines that apply to any analysis used to support government decisions to initiate, renew, or expand programs or projects that would result in a series of measurable benefits or costs extending for 3 or more years into the future.⁴³ Given changing market conditions and future projections, without conducting additional analysis to supplement its 2016 review and thereafter periodically reexamining the SPR to take into account changes in market conditions and include a thorough consideration of the costs and benefits of a wide range of SPR sizes, DOE cannot provide information to Congress to inform decisions about the appropriate size of the SPR and risks holding too much or too little in the SPR to meet the United States' evolving energy security needs and IEA obligations.

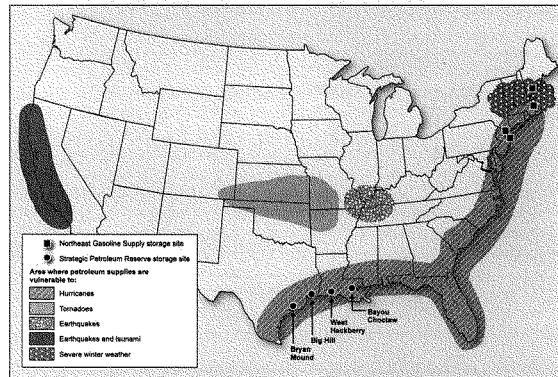
⁴²GAO, *21st Century Challenges: Reexamining the Base of the Federal Government*, GAO-05-325SP (Washington, D.C.: Feb. 1, 2005).

⁴³Office of Management and Budget Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, (Oct. 29, 1992).

DOE Has Not Identified Whether Additional Regional Petroleum Product Reserves Should Be Part of the SPR

DOE has also not fully identified whether additional regional petroleum product reserves should be part of the SPR. Because the SPR stores oil nearly exclusively along the Gulf Coast, the SPR is configured primarily to respond to global oil supply disruptions. However, as we reported in November 2017, the SPR has primarily been used in response to domestic disruptions. The SPR is limited in its ability to respond to domestic disruptions because reserves are almost entirely composed of crude oil and not refined petroleum products, which may not be effective in responding to disruptions that affect the refining sector.⁴⁴ For example, as we reported in November 2017, Hurricanes Harvey, Irma, and Maria damaged infrastructure and property, caused the loss of life, and disrupted the operations of refineries representing at least 15 percent of the nation's refining capacity.⁴⁵ DOE has identified regions subject to product supply vulnerabilities as shown in Figure 3.

Figure 3: U.S. Strategic Petroleum Reserve Locations and Regional Petroleum Product Supply Vulnerabilities Identified by the Department of Energy in 2014



Source: Department of Energy, Map Resources (map). | GAO-18-477

⁴⁴GAO-18-209T.

⁴⁵GAO-18-209T.

The Quadrennial Energy Review of 2015 recommended that the agency analyze the need for additional or expanded regional product reserves by undertaking updated cost-benefit analyses for all of the regions of the United States that have been identified as vulnerable to fuel supply disruptions.⁴⁶ In response to this recommendation, DOE studied the costs and benefits of regional petroleum product reserves in the West Coast and Southeast Coast. According to DOE officials, weather events in the Southeast Coast are of higher probability but lower consequence, and events in the West Coast are of lower probability but higher consequence. DOE did not finalize its 2015 studies on regional petroleum product reserves and make them publicly available. However, the draft 2015 studies concluded that a product reserve in the Southeast would provide significant net economic benefits to the region and the United States, particularly in the event of a major hurricane, while further analyses are needed to determine the potential benefits of a reserve on the West Coast.⁴⁷ A prior DOE study also suggests that petroleum product reserves merit consideration—in 2011, DOE carried out a cost-benefit study of the establishment of a refined product reserve in the Southeast and estimated that such a reserve would reduce the average gasoline price rise by 50 percent to 70 percent in the weeks immediately after a hurricane landfall, resulting in consumer cost savings, according to the Quadrennial Energy Review of 2015.⁴⁸ According to DOE officials, the agency has no plans to conduct additional studies. DOE's 2016 review of the SPR did not fully assess whether there is a need for additional regional product reserves in other U.S. regions identified as vulnerable to fuel supply disruptions, as recommended by DOE's studies and the 2015

⁴⁶U.S. Department of Energy, *Quadrennial Energy Review: Energy Transmission, Storage, and Distribution Infrastructure*, April 2015. A 2014 Presidential memorandum created a Quadrennial Energy Review Task Force, co-chaired by the Directors of the Domestic Policy Council and the Office of Science and Technology Policy, with support from the Secretary of Energy. The Quadrennial Energy Review Report, to be submitted to the President every 4 years, is to, among other things, provide an integrated view of, and recommendations for, federal energy policy in the context of economic, environmental, occupational, security, and health and safety priorities, with attention in the first report given to the challenges facing the nation's energy infrastructures. The first report was issued in April 2015.

⁴⁷While this finding of the draft 2015 studies is pre-decisional and was not approved by DOE, we report it here because DOE has relied on related findings from the draft 2015 studies in its response to our report and recommendations (see appendix I).

⁴⁸Although this finding was reported in the 2015 Quadrennial Energy Review, according to DOE officials, all aspects of the 2011 study remain draft and pre-decisional since DOE did not officially approve the study.

Quadrennial Energy Review. Without completing studies on the costs and benefits of regional petroleum product reserves for all the vulnerable U.S. regions and publicly releasing the results, DOE cannot ensure that it and Congress have the information they need to make decisions about whether additional regional product reserves are needed.

DOE Has Taken Steps to Update Its Modernization Plans, But Is Hindered by Uncertainty Regarding the SPR's Long-term Size

DOE Has Taken Steps to Update Its Modernization Plans for Currently Mandated Sales

DOE has taken steps to take into account the effects of congressionally mandated oil sales in its plans for modernizing the SPR, though DOE's current plans are based on information largely developed prior to the most recent congressionally mandated oil sales. According to DOE, the SPR modernization program is focused on a life extension project to modernize aging infrastructure to ensure the SPR will be able to meet its mission requirements for the next several decades. The project's scope of work has undergone several revisions since its inception in response to changing conditions and requirements, according to the agency.⁴⁹ DOE has estimated the total cost for the SPR's modernization at up to \$1.4 billion. DOE raised about \$323 million for modernization through the sale of SPR oil in fiscal year 2017, and the Consolidated Appropriations Act of 2018 provided that DOE is to draw down and sell an amount of crude oil not to exceed \$350 million for modernization in fiscal year 2018.⁵⁰ As of the end of February 2018, DOE has spent \$22 million on modernization efforts and the additional funds will allow DOE to continue moving forward with the project, according to agency officials. According to DOE's modernization plans, the first major construction is scheduled for fiscal year 2019. However, these plans are largely based on information DOE analyzed before recent congressionally mandated sales of an additional 117 million barrels of oil.

⁴⁹Since 2016, DOE conducted additional supplemental analysis of alternatives to update its modernization plans which resulted in additions and deletions of tasks from the project's original scope of work, according to the agency.

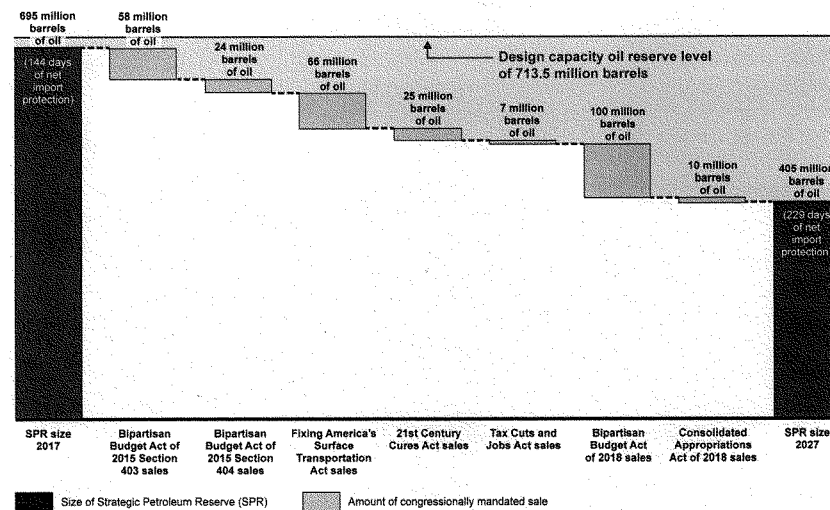
⁵⁰Pub. L. No. 115-141, Div. D, Tit. III (2018). The act further provides that, as authorized by section 404 of the Bipartisan Budget Act of 2015, the proceeds from such drawdown and sale shall be deposited into the Energy Security and Infrastructure Modernization Fund.

Since the most recent mandated sales, DOE has taken steps to update its modernization plans and has changed its assumptions for SPR's modernization. For example, DOE now assumes that the reserve will hold about 405 million barrels of oil and that one of the four SPR sites may close after congressionally mandated sales are completed at the end of fiscal year 2027, according to agency officials. However, DOE has not fully updated the SPR's modernization plans based on these assumptions. According to DOE officials, in March 2018, DOE commenced a study—the SPR post-sale configuration study—to examine potential future reserve configurations. This study is to take into account the effects of congressionally mandated sales on the reserve and its modernization, and is targeted for completion in October 2018, according to agency officials. Information from the study will inform DOE's updates to the SPR's modernization plans, according to DOE officials.

As part of its post-sale configuration study, DOE plans to examine how the agency may handle the potentially excess SPR facilities created by the mandated sales. In January 2017, the SPR had a design capacity to hold 713.5 million barrels of oil and actually held 695 million barrels. As shown in figure 4, without action by DOE to reduce the SPR's design capacity or otherwise use SPR facilities, congressionally mandated sales will cause excess storage capacity to grow to 308 million barrels or more by the end of fiscal year 2027—meaning that about 43 percent of the SPR's total design capacity to store oil would be unused.⁵¹

⁵¹According to DOE officials, as part of contingency planning, spare capacity is required in the event that oil must be removed from a cavern and the cavern is rendered unsuitable for oil storage. Moreover, natural creep on storage caverns reduces the amount of storage capacity across the SPR with the reserve losing about 1.2 million barrels per year across the SPR to natural cavern creep and another 1 million barrels per year are lost due to depressurizing caverns, according to DOE officials.

Figure 4: Oil Inventory Held in the Strategic Petroleum Reserve in 2017 and Projected Oil Inventory in 2027 Compared to the Reserve's Design Capacity in 2017



Sources: GAO analysis of U.S. Department of Energy and U.S. Energy Information Administration data. | GAO-18-477

Note: Volumes of oil to be sold under section 404 of the Bipartisan Budget Act of 2015 (sales to fund SPR modernization) are U.S. Department of Energy estimates.

DOE plans to explore some options to use these potentially excess SPR assets in its ongoing post-sale configuration study. In withdrawing oil to meet congressionally mandated oil sales currently in place (290 million barrels through fiscal year 2027), DOE could close at least one SPR site based on our analysis of projected excess storage capacity. For example, if DOE were to close the smallest SPR site, Bayou Choctaw, the agency could also explore selling the connected pipeline and marine terminal, which are currently being leased to a private company. DOE could also consider leasing excess storage capacity to other countries so that they

could store oil at the SPR.⁵² DOE has not entered into any such leases with other countries and has not considered such leases because, according to DOE, the SPR has historically lacked capacity to store additional oil. DOE has not proposed any of these options or explored the revenue the agency could generate by selling or leasing these assets. According to DOE officials, the agency will examine the feasibility of such options in the ongoing SPR post-sale configuration study.

**Uncertainty Has
Hampered DOE's Efforts
to Account for Potential
Future Mandated Sales**

As DOE takes steps to plan for the SPR's modernization, ongoing uncertainty regarding the SPR's long-term size and configuration have complicated DOE's efforts. According to DOE officials, this uncertainty makes it extremely difficult to effectively perform any mid-to long-range planning efforts for the SPR's modernization project, including the execution of major maintenance projects. Congress has generally set the SPR's size by mandating purchases or sales of oil, and has established and amended the minimum size of the SPR as it pertains to the release of oil for emergency protection. Since 2015, Congress has, across six pieces of legislation, mandated 290 million barrels in additional oil sales. However, DOE developed its modernization plans in 2016. DOE officials told us they do not know whether additional sales will be mandated over the next 10 years or whether other changes may be required to the configuration of the reserve. Any additional congressionally mandated sales or direction to pursue additional petroleum product reserves would require DOE to again revisit its modernization plans and assessments of the potential uses of any excess SPR assets. Oil market projections also have implications for the future of the SPR. Under current projections, the United States may fluctuate between being a net importer and net exporter over the next several decades. Specifically, the United States is projected to become a net exporter by the late 2020s and would then no longer have a 90-day reserve obligation, but it is projected to return to being a net importer between 2040 and 2050. These projected fluctuations could affect the desired size of the SPR in the future. This uncertainty creates risks for DOE's modernization plans, as DOE may end up spending funds on facilities that later turn out to be unnecessary should Congress ultimately decide on a larger- or smaller-sized SPR than DOE anticipates.

⁵²The Energy Policy and Conservation Act provides that the Secretary of Energy, by lease or otherwise, may store in underutilized SPR facilities petroleum product owned by a foreign government or its representative. 42 U.S.C. § 6247a(a).

Having a long-term target for the size and configuration of reserves helps other IEA member countries manage their reserves. For example, as previously discussed, unlike the United States, some other IEA members have specified in dynamic terms the amount of reserves to be held, such as days of net import protection or days of consumption, rather than specifying a specific static volume amount. Under such approaches, the amount held varies over time as entities managing the reserve acquire or sell reserves in order to meet the target. Setting a long-term target for the size and configuration of the SPR—taking into account projections for oil production, consumption, and IEA obligations—could better position DOE to ensure that funds spent on the SPR's modernization do not modernize a system that is no longer needed and that DOE is able to adequately plan for potentially excess SPR assets.

In the course of our work, we also identified other options for handling potentially excess SPR assets that DOE is not planning on examining, largely because DOE does not currently have the authority to pursue them, according to agency officials. First, DOE could explore leasing storage capacity to private industry. U.S. oil production has generally increased over the last decade. As a result, the private sector may want to lease excess SPR capacity, which may be cheaper than above-ground storage, according to a representative of a private company we spoke with. Fees for doing so could help defray public reserve storage costs. However, officials told us that the Energy Policy and Conservation Act gives DOE authority to lease underutilized storage to other countries, but not to the private sector. Second, if Congress determines that the SPR holds oil in excess of that needed domestically, DOE could explore selling contracts or tickets for the excess oil rather than selling the oil outright. Australian and New Zealand officials told us that if DOE were to sell tickets for SPR oil, tickets would help these countries meet their IEA 90-day reserve obligations. Australian officials told us they have discussed this option with DOE. Currently the United States and Australia have agreed, through an arrangement, to allow Australia to contract for petroleum stocks located in the United States and controlled by commercial entities. According to DOE officials, the arrangement would permit Australia to receive credit from the IEA for tickets it purchases from the U.S. private sector. While the arrangement does not cover government-owned oil in the SPR, if it did, based on our analysis, DOE could generate up to approximately \$15 million annually if Australia purchased the maximum allowable amount of oil specified in an

arrangement through tickets for excess SPR oil.⁵³ However, although the Energy Policy and Conservation Act allows DOE to lease underutilized storage to other countries, DOE lacks the authority to sell tickets and does not plan to seek this authority, according to DOE officials. DOE officials told us that they do not plan to examine these options.

According to DOE's real property asset management order, the agency is to identify real property assets that are no longer needed to meet the program's mission needs and that may be candidates for reuse or disposal.⁵⁴ Once identified, the agency is to undertake certain actions, including determining whether to dispose of these assets by sale or lease. As part of its SPR post-sale configuration study, DOE plans to determine whether it is appropriate to close SPR facilities, and the relative benefit of any closures would be informed by potential lease revenues from maintaining sites so they could be leased, according to officials. However, without examining a full range of options in the post-sale configuration study, DOE risks missing beneficial ways to modernize the SPR while saving taxpayer resources.

Conclusions

Given changing crude oil and petroleum product market conditions and the constrained budget environment, it is important that DOE ensures the SPR is effective at meeting U.S. energy security needs and IEA obligations while being managed and maintained in an efficient manner. In response to congressional direction and recommendations from GAO and DOE Inspector General, DOE conducted a long-term strategic review of the SPR in 2016 after its last comprehensive examination in 2005. In its review, DOE did not determine an optimal size for the SPR, and its analysis was limited in several ways. In particular, DOE did not fully consider recent and expected future changes in crude oil and petroleum market conditions such as the implications of projected fluctuations in U.S. net imports or the role that increased levels of private reserves could play in responding to supply disruptions. DOE also did not perform a full cost-benefit analysis of holding different volumes of reserves. Without supplementing its 2016 strategic review by conducting additional analysis,

⁵³The estimated amount is based on average monthly projected ticket prices in 2018 for crude oil and an arrangement between the United States and Australia that outlines the maximum amount of oil that Australia can purchase in the form of tickets from commercial entities located in the United States.

⁵⁴U.S. Department of Energy, Real Property Asset Management, DOE Order 430.1C (Washington, D.C.: August 2016).

and periodically conducting such analyses going forward, DOE cannot provide information to Congress to inform decisions about the appropriate amounts of crude oil and petroleum products to hold in the SPR and risks holding too much or too little in the SPR to meet the United States' energy security needs and international obligations. Such information is needed on a timely basis, to reflect the pace of change in oil and petroleum markets and other relevant factors that affect the optimal size of the SPR.

Though the SPR has primarily been used in response to domestic supply disruptions, such as hurricanes, the reserve is limited in this role because it is almost entirely composed of crude oil, and not petroleum products. In this regard, the Quadrennial Energy Review of 2015 recommended that DOE analyze the need for additional regional product reserves for U.S. regions that have been identified as vulnerable to fuel supply disruptions. DOE has not identified whether additional regional product reserves should be part of the SPR or completed studies of all vulnerable U.S. regions, and it has no plans to do so, according to DOE officials. Without conducting or completing studies for all the vulnerable U.S. regions and releasing the results, DOE cannot ensure it and Congress have the information they need to make decisions about potential additional regional product reserves.

In the face of declining net U.S. imports, Congress has taken repeated steps to reduce the size of the reserve. Given that net imports are projected to continue to decline through the late 2020s and fluctuate in the future, there may be additional congressionally mandated SPR oil sales. This has created long-term uncertainty regarding the future size and configuration of the SPR. Congress could address this uncertainty by identifying a long-term target for the size of the SPR—either by volume or in terms tied to factors, such as consumption or net import protection, that affect the country's energy security needs and IEA obligations. Setting such a long-term target could better position DOE to ensure the efficiency and efficacy of federal funds spent on the reserve.

DOE has recently begun to study the potential effects of congressionally mandated sales on its modernization plans. As part of its SPR post-sale configuration study, DOE plans to determine whether it is appropriate to close SPR facilities, and the relative benefit of any closures would be informed by potential lease revenues from maintaining sites so they could be leased, according to officials. However, we identified other options for handling potentially excess SPR assets that DOE is not planning to examine in its study, inconsistent with the agency's order on real property asset management. Although DOE does not currently have the authority

to implement these options, according to officials, examining their potential use, including possible revenue enhancement, could inform Congress as it examines whether it should grant such authority. Without examining a full range of options in the post-sale configuration study for handling potentially excess SPR assets, DOE risks missing beneficial ways to modernize the SPR while saving taxpayer resources.

Matter for Congressional Consideration

We are making the following matter for congressional consideration:

Congress may wish to consider setting a long-range target for the size and configuration of the SPR that takes into account projections for future oil production, oil consumption, the efficacy of the existing SPR to respond to domestic supply disruptions, and U.S. IEA obligations. (Matter 1)

Recommendations for Executive Action

We are making four recommendations to DOE:

The Secretary of Energy should supplement the agency's 2016 long-term strategic review by conducting an additional analysis that takes into account private-sector response, oil market projections, and costs and benefits of a wide range of different SPR sizes. (Recommendation 1)

The Secretary of Energy should take actions to ensure that the agency periodically conducts and provides to Congress a strategic review of the SPR that, among other things, takes into account changes in crude oil and petroleum product market conditions and contains additional analysis, such as the costs and benefits of a wide range of different SPR sizes. (Recommendation 2)

The Secretary of Energy should conduct or complete studies on the costs and benefits of regional petroleum product reserves for all U.S. regions that have been identified as vulnerable to fuel supply disruptions, and the Secretary should report the results to Congress. (Recommendation 3)

The Secretary of Energy, in completing DOE's ongoing study on the effects of congressionally mandated sales, should consider a full range of options for handling potentially excess assets and, if needed, request congressional authority for the disposition of these assets. (Recommendation 4)

Agency Comments and Our Evaluation

We provided a draft of this report to DOE for review and comment. DOE provided written comments, which are reproduced in appendix I. Of the four recommendations, DOE agreed with two, partially agreed with one, and disagreed with one.

- Regarding our recommendation that DOE supplement its 2016 long-term strategic review with an additional analysis that takes into account private sector response, oil market projections, and costs and benefits of a wide range of different SPR sizes, the agency partially agreed with the recommendation. DOE agreed to conduct an additional analysis to assess the purpose, goals, and objectives of the SPR, taking into account private sector response, oil market projections, and any other relevant factors, that will lead to an evaluation of possible optimal sizes of the SPR in the future. In response to taking into account the costs and benefits of a wide range of different SPR sizes, DOE stated that the agency determined the projected benefits of a wide range of different SPR sizes ranging from 430 million barrels of oil to 695 million barrels of oil in its 2016 review. However, the minimum SPR size considered by DOE is greater than the projected SPR size after congressionally mandated sales have occurred. Further, the SPR size after congressionally mandated sales is projected to be far in excess of the IEA obligation to hold a minimum of 90 days of net imports. DOE must also consider the minimum size needed to meet its IEA obligations in the event of a collective action. In conducting additional analysis, DOE should consider a smaller lower bound, in line with congressionally mandated sales, for the size of the SPR, and more fully consider the size needed to meet the IEA 90-day net import and collective action obligations.
- Regarding our recommendation that DOE conduct periodic reviews of the SPR, the agency agreed with the recommendation. DOE stated that a 5-year time interval between reviews would strike an appropriate balance between the need to periodically conduct a strategic assessment and evaluation of the SPR and the limitations on resources to plan and conduct such a review.
- Regarding our recommendation that DOE conduct or complete studies on the costs and benefits of regional petroleum product reserves, the agency disagreed. DOE stated that it is the agency's position that government owned and operated regional petroleum product reserves are an inefficient and expensive solution to respond

to regional fuel supply disruptions. DOE further stated, based on studies done in 2015 that DOE officials told us were pre-decisional and therefore could not be reported, that there are additional concerns associated with government-owned and operated regional refined petroleum product reserves, including little to no storage capacity for lease in commercial terminals and high costs for government owned and operated regional product reserves. However, these same studies took these concerns into account, and concluded that a product reserve in the Southeast would provide significant net economic benefits (benefits minus costs) to the region and the United States in the event of a major hurricane. These studies also concluded that additional analyses are required to inform decisions regarding the potential benefits of a similar reserve on the West Coast. Further, the Quadrennial Energy Review of 2015 recommended that similar analyses be completed for other areas deemed by DOE to be vulnerable to fuel supply disruptions. Therefore, we continue to believe that conducting these analyses, as recommended in the Quadrennial Energy Review of 2015, will provide Congress with information needed to make decisions about regional product reserves.

- Regarding our recommendation that DOE consider a full range of options for handling potentially excess assets, DOE agreed with the recommendation. DOE stated that in its ongoing study, the agency will include an assessment of disposition options for any potential excess or underutilized SPR assets, to include the need for new legislative authority, as necessary, for the disposition of assets. DOE expects this study to be completed in October 2018.

DOE also provided technical comments, which we incorporated, as appropriate.

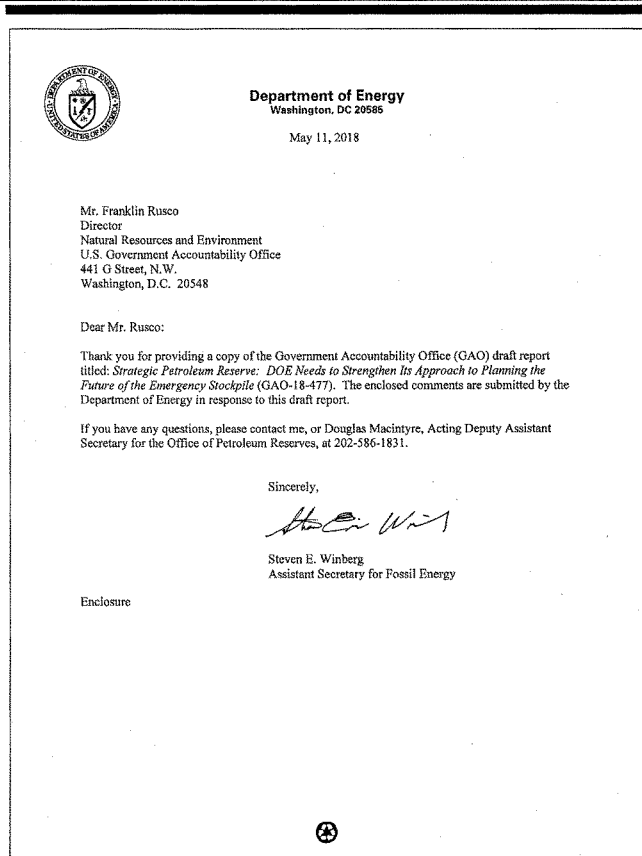
As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Secretary of Energy, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or ruscof@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix II.



Frank Rusco
Director, Natural Resources and Environment

Appendix I: Comments from the Department of Energy



Response to Report Recommendations

Recommendation 1: The Secretary of Energy should supplement the agency's 2016 long-term strategic review by conducting an additional analysis that takes into account private sector response, oil market projections, and costs and benefits of a wide range of different SPR sizes.

DOE's Response:

DOE **partially concurs** with this recommendation. DOE's 2016 long-term strategic review (LTSR) of the SPR utilized modeling to determine the projected benefits of a wide range of different SPR crude oil inventory sizes ranging from 430 million barrels to 695 million barrels, and DOE's entire modeling effort was built around the oil market projections contained in the Energy Information Administration's 2015 Annual Energy Outlook. It should be noted the tasking from Congress that motivated the LTSR did not request a full cost-benefit analysis of the SPR itself. Such an endeavor would not yield much insight, given that the vast majority of the major lifecycle costs of the SPR are sunk costs since the infrastructure is built and the crude oil inventory has already been acquired.

However, DOE does agree to conduct additional analysis to assess the purpose, goals, and objectives of the SPR, taking into account private sector response, oil market projections, and any other relevant factors, that will lead to an evaluation of possible optimal sizes of the SPR in the future. In doing this analysis, DOE will address Sec. 161(d)(2) of the Energy Policy and Conservation Act that states that the President will direct a drawdown and sale of the SPR upon determination of a "severe energy supply interruption or by obligations of the United States under the international energy program." This analysis will be an input into policy discussions about the size of the SPR. Until such time, we would refer policymakers to the Quadrennial Energy Review which suggests a range of optimal sizes. DOE expects to begin this analysis after completion of an SPR Post-Sale Configuration Study analysis that is due to be completed in October 2018. The additional analysis recommended would use the results of the SPR Post-Sale Configuration and DOE expects the additional analysis would be completed in FY 2019.

Recommendation 2: The Secretary of Energy should take actions to ensure that the agency periodically conducts and provides to Congress a strategic review of the SPR that, among other

Appendix I: Comments from the Department of
Energy

things, takes into account crude oil and petroleum product market conditions, and contains additional analysis, such as the costs and benefits of a wide range of different SPR sizes.

DOE's Response:

DOE **concurs** with this recommendation. A five-year time interval between reviews strikes an appropriate balance between the need to periodically conduct a strategic assessment and evaluation of the SPR against resource limitations required to plan and conduct a strategic review.

***Recommendation 3:** The Secretary of Energy should conduct or complete studies on the costs and benefits of regional petroleum product reserves for all of the regions of the United States that had been identified as vulnerable to fuel supply disruptions and report the results to Congress.*

DOE's Response:

DOE **does not concur** with this recommendation. It is DOE's position that Government-owned and/or operated regional reserves of refined petroleum products are an inefficient and expensive solution to respond to regional fuel supply disruptions. The operating cost of the SPR is less than \$0.25 per barrel of authorized crude oil storage capacity per year. Results of international benchmarking studies of petroleum stockholding countries performed by the benchmarking group of the Annual Coordinating Meeting of Entity Stockholders (ACOMES) have consistently shown SPR crude oil storage and operating costs to be the most economic operating system in the world. By comparison, results from these same studies have shown the storage and operating costs associated with refined petroleum product reserves in the United States to be the most expensive in the world, with U.S. gasoline storage and operating costs 86% higher than the storage and operating costs of the next highest country. Given that the United States has the most robust refining capability in the world, it is much more economic for the SPR to supply additional crude oil to refineries to help resupply refined petroleum product markets through existing distribution systems.

There are additional concerns associated with government-owned and/or operated regional refined petroleum product reserves. The West Coast (PADD V) and Southeast U.S. studies conducted in 2015 indicated there was little to no spare storage capacity for lease in commercial terminals in these regions. This lack of storage capacity would preclude DOE from employing a model similar to that utilized for the Northeast Gasoline Supply Reserve and the Northeast Home Heating Oil Reserve, in which the U.S. government owned the refined petroleum product and leased commercial storage at private sector facilities, extremely high costs of storage

notwithstanding. In addition to high storage costs, the U.S. government would be responsible for acquisition costs of any refined petroleum product purchased. As of mid-April 2018, market prices of \$2.03 per gallon for gasoline (\$85.26 per barrel) and \$2.08 per gallon for ultra-low sulfur distillate (ULSD) (\$87.36 per barrel), the acquisition costs for a 5 million barrel reserve for these refined petroleum products would be \$426.1 million dollars for gasoline and \$436.8 million dollars for ULSD. For government-owned and operated regional refined petroleum product reserves, there would be significant initial capital expenditures required to plan, design, and construct any new storage and distribution facilities. Lifecycle costs would also be extremely high, since funding would be required to staff, maintain, and operate the facilities. As noted above, there would also be significant acquisition costs for the refined petroleum products. Additionally, there are operational challenges associated with this model. Unlike stored crude oil, refined petroleum products in storage must be periodically rotated to maintain product quality and usefulness in an emergency. This would require the U.S. government to completely turnover the existing inventory multiple times a year, resulting in an almost constant cycle of selling existing inventory and buying new inventory. This would result in the U.S. government being in direct competition with the private sector, and would distort local markets.

The GAO report notes that as of December 2017, 18 IEA member countries either fully or partially utilized an industry stockholding model consisting of both crude oil and refined petroleum products to meet their oil stockholding obligations. This model places a requirement on certain companies in the petroleum industry, such as importers, refiners, product suppliers or wholesalers, to hold a minimum inventory level of stocks to be made available upon government direction. While the United States currently employs a government stockholding model through which stockholding obligations are met by the SPR, an industry stockholding model could be considered as an alternative to any government-owned and/or operated regional refined petroleum product reserve to address regional fuel supply disruptions. This would, however, place stockholding mandates and additional costs on the U.S. petroleum industry and require new legislation and regulations in order to implement mandated private industry drawdowns. Furthermore, taxpayers could ultimately be charged for the premiums industry would need to pay for additional storage and increased product inventory requirements through price increases at the pump.

Industry stockholding requirements have been evaluated since the SPR was first legislated into existence in 1975. The original text of EPCA gave DOE (at the time the Federal Energy Administration, or FEA) discretionary authority to require importers to hold stocks equivalent to up to three percent of the previous year's imports and directed FEA to analyze the potential efficacy of an Industrial Petroleum Reserve (similar to today's industry stockholding model) in the initial SPR plan. This evaluation concluded that such a system would be difficult to administer in practice, that it would place an undue burden on the oil industry, and that it would ultimately serve as a less effective energy security tool. DOE re-evaluated the government-owned model again in the 1980s in response to the SPR's growing pains (which were chronicled in a 1977 GAO report), but determined that the administrative and financial challenges of

Appendix I: Comments from the Department of
Energy

changing the oil stockholding model would be too difficult to overcome given that it would require new legislation.

Recommendation 4: The Secretary of Energy, in completing its ongoing study on the effects of congressionally-mandated sales, should consider a full range of options for handling potentially excess assets, and if needed, request congressional authority for the disposition of these assets.

DOE's Response:

DOE **concerns** with this recommendation. DOE's Office of Petroleum Reserves commenced a SPR Post-Sale Configuration Study in March 2018 to evaluate options for the long-term configuration of the SPR as a result of recently enacted congressionally-mandated SPR crude oil sales legislation. This study will include an assessment of disposition options for any potential excess or underutilized SPR assets, to include the need for new legislative authority, as necessary, for the disposition of these assets. DOE expects this study to be completed in October 2018.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Frank Rusco, (202) 512-3841 or ruscof@gao.gov

Staff Acknowledgments

In addition to the individual named above, Quindi Franco (Assistant Director), Nkenge Gibson (Analyst-in-Charge), Philip Farah, Ellen Fried, Cindy Gilbert, Greg Marchand, Celia Mendive, Patricia Moye, Camille Pease, Oliver Richard, Dan Royer, Rachel Stoiko, and Marie Suding made key contributions to this report.

GAO's Mission	The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.
Obtaining Copies of GAO Reports and Testimony	The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's website (https://www.gao.gov). Each weekday afternoon, GAO posts on its website newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to https://www.gao.gov and select "E-mail Updates."
Order by Phone	The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, https://www.gao.gov/ordering.htm . Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537. Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.
Connect with GAO	Connect with GAO on Facebook, Flickr, Twitter, and YouTube. Subscribe to our RSS Feeds or E-mail Updates. Listen to our Podcasts. Visit GAO on the web at https://www.gao.gov .
To Report Fraud, Waste, and Abuse in Federal Programs	Contact: Website: https://www.gao.gov/fraudnet/fraudnet.htm Automated answering system: (800) 424-5454 or (202) 512-7470
Congressional Relations	Orice Williams Brown, Managing Director, WilliamsO@gao.gov , (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548
Public Affairs	Chuck Young, Managing Director, youngc1@gao.gov , (202) 512-4800, U.S. Government Accountability Office, 441 G Street NW, Room 7149, Washington, DC 20548
Strategic Planning and External Liaison	James-Christian Blockwood, Managing Director, spel@gao.gov , (202) 512-4707, U.S. Government Accountability Office, 441 G Street NW, Room 7814, Washington, DC 20548



Please Print on Recycled Paper.

