TERRORISM AND THE GLOBAL OIL MARKETS

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TERRORISM AND THE GLOBAL OIL MARKETS

THURSDAY, DECEMBER 10, 2015

U.S. Senate,
Committee on Energy and Natural Resources,
Washington, DC.

The Committee met, pursuant to notice, at 10:09 a.m. in Room SD–366, Dirksen Senate Office Building, Hon. Lisa Murkowski, Chairman of the Committee, presiding.

OPENING STATEMENT OF HON. LISA MURKOWSKI,
U.S. Senator from Alaska

The CHAIRMAN. We are calling the Committee to order this morning. This should be a very interesting and informative hearing as we conduct oversight on the intersection of terrorism and the global oil markets.

Before we begin I would like to take a moment and introduce a former colleague here in the Senate and a former Chairman of the Energy Committee and longtime friend of mine, that would be my father, Frank Murkowski, who has placed a keen interest in trying to understand the role between oil and terrorism and the connect there. It just so happens that he is in town today. We did not do this hearing because of him, but the timing worked out. It is nice to have him before the Committee.

More than half of global oil production occurs in regions of the world, whether it is the Middle East, Africa, Russia, Venezuela, that are subject to instability of various kinds including civil war and terrorism. Oil production in certain countries such as Iraq, Syria, Libya, Yemen, Sudan, has been knocked off line due to terrorism and related violence. The indisputable fact that we are dealing with is that North American barrels have largely replaced this disrupted production so far. In tandem with the machinations at OPEC, the global oil supply is simply saturated and may be for quite some time to come.

We also know that Iran, one of the original and most deadly state sponsors of terrorism, will soon be rejoining the global oil market if President Obama gets his way, even as he continues to fight efforts by many of us to repeal the outdated oil export ban that would allow us here in this country to send oil to our allies. But I think it does beg the question and part of the discussion, hopefully this morning, will be with that new source of revenue that Iran is anticipated to receive, what do we do with it? What will the intentions of these mullahs be? Is it going to be to do good and build hospitals or is it going to be to direct yet additional sources of revenue to the terrorist organizations?
In recent months we have seen a great deal of discussion about ISIS oil production and distribution and coalition efforts to disrupt this source of revenue. Bottom line is that this oil is helping to finance terrorism and significantly finance terrorism.

I have long argued that energy security is central to national security. Last year we released a series of staff reports. One was entitled “Oil Production Outages and Strategic Warning.” Another was “Iraq through the Lens of Energy.” Also a report entitled “A Dark Pool in the Mideast, the Problem of ISIS Oil Sales.” Today I am re-releasing them for public education and review. I think it is just, kind of, a historical walk through understanding some of the ties that we have.

But it is not just funding of terrorism by ISIS that we will explore this morning. I am concerned about continued violence in Libya which is a significant source of light crude for our allies in Europe. If we are smart enough to lift the ban on our oil exports, our nation could sell light crude to our partners in Europe and help in that way.

Terrorists are also active in West Africa or Nigeria is a major oil producer and could potentially threaten vital choke points such as the Suez Canal, the Strait of Hormuz or elsewhere. That is, in part, why I have been so determined and I think my colleague here, Senator Cantwell, to make sure that we do not make reckless mistakes when it comes to sales of oil from our Strategic Petroleum Reserve (SPR). It is there for a reason. The word, strategic, is there in a very significant place.

On that front there is a proposal by some to permanently ban production in a small sliver of the non-wilderness portion of ANWR which could be the West Coast Strategic Reserve. In my mind it is just wrong, it is dead wrong. As terrorists threaten oil supplies in the Middle East and as state sponsors of terrorism in Iran prepare to make billions of dollars from selling our oil to allies, some within Congress are talking about intentionally and severely hurting American energy production.

This hearing this morning is chiefly about education. Members of the House and Senate and the Administration must understand the economic and the geopolitical context of the national interest that we are considering.

This Committee has a unique perspective given that over 90 percent of Iraqi government revenues are due to oil exports, given that nearly 90 percent of Syria’s oil production is offline, and given that oil accounts for over 40 percent of ISIS’s monthly revenue, according to IHS.

You can expect me, as Chairman, to continue this conversation into next year as we conduct oversight on the Federal Government’s energy-related activities in the counter terrorism fight.

With that, I will turn to Senator Cantwell for your comments this morning.

STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON

Senator Cantwell. Thank you, Madam Chair.
I, too, want to welcome the former Chair of this Committee, Senator Frank Murkowski, back to the hearing room and also welcome our witnesses and thank them for being here today.

Today's hearing is an important opportunity, as the Chairwoman said, to learn about the critical issues of the energy world, the relationship between terrorism and global oil networks and foremost, about energy security.

I look forward to hearing the witnesses and I look forward, at some point in time, to having the Administration be a witness here as well. Perhaps we can do that in the future or have a hearing in a secure room to get into even more detail on this issue, but it is something I think we need to hear from them on.

At the outset of the hearing I want to make sure that I am making my views known about how important global oil markets are and fighting terrorism and particularly the role of this Committee to consider the impacts of these activities on infrastructure, the risks for U.S. and global energy security and supply and understanding the global picture.

Iran and Iraq have some of the largest oil reserves in the world by some estimates, fourth and fifth largest in the world, so control over this oil has a major impact on global supplies and prices of oil. Overall the movement of oil from the Middle East to world markets is also key to the stability of global supplies. Global energy security depends on diversity of supplies in different countries, but what happens to that oil from the largest reserves still matters because in addition to the United States, growing countries like China have an enormous energy need and they will continue to look for resources to meet their energy needs.

In today's market, where there is robust supply, it would take a significant disruption, maybe somewhere on the magnitude of five to ten percent, to really disrupt the market. To give that a sense of perspective, today's global production is approximately 94 million barrels per day, and ISIS oil production is about 35,000. So that is less than one tenth of one percent.

It is clear, though, that this is a constantly shifting dynamic. And in a tight market, a very, very small amount of disruption can have a very, very significant impact.

I think today's discussion is about where and when we might anticipate disruptions and what to do about them. As I predict, we will probably talk a lot today about following the money or tracking oil proceeds as a way to fight ISIS.

In yesterday's Armed Services Committee hearing, Defense Secretary Ash Carter laid out the Administration's strategy in degrading ISIS' oil infrastructure. He said, "Because of improved intelligence and understanding of ISIL's operations we've intensified the air campaign against ISIL's war sustaining oil enterprise, a critical pillar of ISIL's financial infrastructure. In addition to destroying fixed facilities like well and processing facilities, we have destroyed nearly 400 of ISIL’s oil tankers, reduced the major source of its daily revenues and there's more to come, too."

Well, we will certainly look forward to hearing more about what is to come, and I will be first to say, we do need to do more.

According to Secretary Carter, what made the recent strategy possible was new intelligence that had previously not been avail-
able. He said, “It allowed us to identify those parts of the oil infra-
structure that are being used to actually fund ISIL.”

I was recently briefed by a State Department Special Envoy for
Energy. I was pleased to hear that over the past year, we have
eliminated almost all of ISIS’ refining capacity. I was also pleased
to hear that the raid on the home of former ISIS Oil Emir, Abu
Sayyaf, in May produced actionable intelligence about following the
money and more effective targeting. Whereas previously ISIS could
repair the damage from air strikes within a matter of days, the
current targeting inflicts damage that will take many months, even
a year, to repair.

Another piece of news is that ISIS no longer controls any of the
fields in Iraq.

While progress has been made, it is very important to under-
stand how adaptable ISIS is and that is why it is important for us
to adapt too. It is clear that ISIS adapts their strategies and they
have continued to look at this as a main resource. We need to act
swiftly and decisively as well.

ISIS is supported by fuel purchases by the Assad regime. To me,
that needs to end. One of the most troubling realities of the situa-
tion is that the ISIS oil is being purchased by their enemy, the
Assad regime, either paying cash or other means. In fact, the U.S.
Treasury recently sanctioned a Syrian individual for facilitating oil
purchases from ISIS.

Instead of focusing on alleged oil smuggling in Turkey, Russia
needs to use its influence to stop the Assad regime from buying oil
and gas from ISIS. I know Secretary Kerry is traveling to Moscow
today, so maybe that is a conversation that he can have.

But the large and troubling issue is that for years terrorist orga-
nizations have been funded through oil sales. The Chairwoman just
mentioned a few of those incidents in her statement.

In Nigeria, for example, oil has fueled conflicts since 2005. Boko
Haram, the group that bombed the United Nations building in Ni-
ergia’s capital and kidnapped 270 schoolgirls and killed over 10,000
people, is likely funded through crude oil theft and sales.

Nearly 40 percent of the U.S. energy demand is met by oil, and
93 percent of transportation is fueled by oil. I also think it is im-
portant given the fact that these terrorists target oil, we need to
continue to diversify our energy sources in the interest of national
security.

In the past, roughly six percent of our nation’s GDP has gone to
purchasing petroleum.

Forty years ago we created the Strategic Petroleum Reserve to
prevent economic and security impacts of crude oil disruptions. The
Chairwoman and I remain committed to making sure the Strategic
Oil Reserve is a strong asset for our nation.

We recently worked to make sure that the Quadrennial Energy
Review’s identification of infrastructure investment needed for the
Strategic Petroleum Reserve—given the shift change that we have
seen in the United States over our resources and where they are—
that those investments need to be made.

The 2015 budget agreement and the Transportation Bill author-
ized sales of more than $13 billion worth of SPR Oil. The SPR, as
a safety net, is being shredded and we must keep this as a resource for us to protect against instability in oil markets.

So while I am sure we are going to hear a lot of discussion today from our panelists about the larger implications of national security and our dependence on oil, we need to continue to make sure that we are doing everything here at home so that we are secure and that we are isolated to the greatest degree possible from these impacts on our economy.

I thank you, Madam Chair, and again, I look forward to hearing the witnesses.

The CHAIRMAN. Thank you, Senator Cantwell for a very strong statement. I appreciate it.

Welcome to each of the panelists that have joined us here today. We appreciate you giving us this time and the attention on the subject of the day, terrorism and global oil markets.

The panel will be led off by Dr. Keith Crane, who is the Senior Economist for RAND Corporation, welcome to the Committee. He will be followed by Mr. Peter Harrell, who is the Adjunct Senior Fellow for a Center for New American Security, welcome. Dr. Sara Vakhshouri is the Nonresident Senior Fellow for the Atlantic Council, thank you for joining us. And we will wrap up the panel with Mr. Jamie Webster, who is a Senior Director for IHS. We appreciate you being here this morning, and not only your contribution, but IHS has been a great source of information for the Committee. So we appreciate that as well.

We ask that you try to confine your remarks to about five minutes. Your full statements will be included as part of the record. Once you have concluded your testimony we will have an opportunity for Members to ask questions.

With that, Dr. Crane, if you would like to begin, please.

Thank you.

STATEMENT OF DR. KEITH CRANE, SENIOR ECONOMIST, RAND CORPORATION

Dr. Crane. Thank you, Chairman Murkowski and Ranking Member Cantwell for the opportunity to testify today. I'm going to talk about ISIL, the insurgency.

ISIL has a large number of affiliates. We know, unfortunately, many people swear allegiance to it. It's been used for branding in Afghanistan and elsewhere.

Terrorist operations tend to cost relatively little so I'm going to focus on the big money which was really is insurgency.

I'm going to talk about what it costs ISIL to run its operations in those areas of Iraq and Syria that it controls. How does ISIL cover those costs? What can we do to reduce those revenues and how effective those measures are likely to be?

So what are ISIL's major costs? The major costs are salaries, especially for fighters, but also there's large numbers of other people, police and intelligence operatives. Roughly there could be 80,000 of those individuals. U.S. intelligence agencies think there's about 31,000 fighters. If you assume $400 a month, we're looking at about $400 million there. Personnel costs are only a fraction of what they spend. There are other costs for hospitals and schools
and ammunition and other supplies. So, total costs are substantially higher.

How does ISIL cover these costs? Oil and sales of oil and refined products are the single most important source of income running at about $500 million a year. In the past Syria used to produce about a third of what North Dakota produces today, maybe 400,000 up to 500,000 barrels per day. That has collapsed over the course of the civil war. We’re now looking anywhere from 35,000 to 50,000 barrels which ISIL controls most. So its sales are running from 40,000 to 50,000 barrels per day.

Most of those sales actually go to small entrepreneurs who run what they call teapot refineries in ISIL-controlled territory, and there are just scads of these if you looked at Google Maps or at area pictures. They refine those products and those refined products, diesel and gasoline, they go everywhere. So they go into Iraq. Of course they go into Syria. They’re sold to ISIL’s enemies. They’re used by ISIL. They go into Turkey, elsewhere.

In addition to that, as the Chairman mentioned, a substantial number of barrels go to the Syrian Government through intermediaries. But that is the most important source of revenue.

In addition to that ISIL has been selling antiquities which it has stolen from Palmyra and elsewhere which could run up to $100 million a year.

The largest source of revenue actually is the other category which consists of extortion, theft of cars, kidnapping and taxes, quotes and tolls.

What can we do to reduce those revenues? We have been targeting oil field facilities like loading depots and tanker trucks. We’ve been, we can put financial sanctions on local businesses in the regions that are dealing with ISIL, we can focus more on dealers and individuals who are purchasing antiquities, and we have also, can use the oil trading network to try to locate and neutralize ISIL current leadership.

How effective are these measures likely to be? It appears that the, our, strategy of hitting oil separation and loading facilities and empty tanks and tanker trucks have put a dent in terms of revenues from oil. In addition, you know, financial sanctions, there are some larger companies in Syria, in the Kurdish regions and elsewhere which have been dealing with ISIL that we could push back on or that we could put under sanction or threaten to do so.

As there’s a limited number of dealers who deal in antiquities or people have the money to spend large amounts to purchase these products or these artifacts, that’s another area where I think we could clamp down on.

And then I think that our intelligence agencies and the U.S. military can continue to focus on these networks.

That said, these measures will not lead to the financial demise of ISIL. There’s other opportunities. There’s ways that they can do work around some oil refined products but they’re good things to do.

To conclude. Measures to reduce funding for ISIL are an important component of our strategy to degrade the organization. Sales of oil and refined oil products are the most important, single source
of revenues and the tactics of focusing on that are an excellent way for our country to, kind of, go ahead.

That said, we're not going to halt all sources of revenue that that organization obtains.

Thank you.

[The prepared statement of Dr. Crane follows:]
The Role of Oil in ISIL Finances

Keith Crane

RAND Office of External Affairs

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Thank you, Chairman Murkowski and Ranking Member Cantwell, for the opportunity to testify today on the role of oil in Islamic State in Iraq and the Levant (ISIL) finances.

Financing Terrorists and Insurgent Groups

RAND researchers have been actively engaged in research on the financing of terrorist groups and insurgencies for decades. This testimony is drawn from past RAND research and information from news reports, public government documents, and other researchers.

Unfortunately, the costs of perpetrating a terrorist attack are small. The bombings in Madrid in March 2004 and the London bombings of July 2005 cost about $80,000 and $15,000, respectively. Terrorists often finance these operations with their own resources or criminal activities. Oil plays little role in financing terrorist attacks because the costs of mounting these attacks are relatively low.

In contrast, insurgent groups like ISIL need substantial sums of money to finance their operations. According to General James Clapper, director of U.S. national intelligence, the intelligence community estimates that ISIL fielded 31,000 fighters in 2014. Others estimate that ISIL has as
many as 80,000 members. ISIL members have to be paid a salary. ISIL also has to pay for ammunition, weapons, and vehicles, as well as fuel and spare parts. It also pays for intelligence and security personnel, schools, and some health care in the areas it controls.

These expenditures add up. Members have reportedly been paid from $100 to $1,000 per month, although these figures have not been publicly confirmed by the group’s own records. RAND researchers estimate that fighters, on average, have received $100 per month. Foreign fighters do not receive a salary, only food and housing. A membership of 80,000 averaging $400 a month in salary would have an annual wage bill of $384 million, while a force of 31,000 with an average wage of $100 per month yields an annual wage bill of about $37 million. In addition, there are the salaries and costs for the leadership, media, police, education, and health care, and even death benefits. According to analyst Aymenn Jawad al-Tamimi, in January 2015 in Deir az-Zor province in Syria, which is under the control of ISIL, total monthly expenditures ran $5.6 million, or about $70 million on an annual basis. Of this figure, monthly salaries for fighters are the largest budgetary costs, amounting to 43.6 percent or about $30 million a year. By comparison “base support” costs amount to 19.8 percent of total expenditures; media, 2.8 percent; Islamic Police, 10.4 percent; the Services Department, 17.7 percent; and aid to families 5.7 percent. Including all costs, IHS Jane’s estimates monthly costs of roughly $80 million or annual costs of close to $1 billion.

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5 “Russian Intelligence Says ISIS Has 60K Militants in Iraq and Syria,” Rudaw.net, October 11, 2015, at http://rudaw.net/english/world/10112015; and “Islamic State ‘Has 50,000 Fighters in Syria,’” Al Jazeera, August 19, 2014.
6 ISIS Pays Foreign Fighters $1,000 a Month: Jordan King,” NBC News, September 22, 2014.
10 In earlier years most fighters received only $100 per month. Foreign fighters do not receive a salary, only food and housing.
In addition to Deir az-Zor in Syria, ISIL also controls parts of Raqqa, Aleppo, and Idleb provinces. In Iraq, it controls most of Anbar and Ninevah provinces, and parts of Salaheddin. It is also active in Diyala and Kirkuk provinces. Deir az-Zor is an important province, and likely is representative of provinces under ISIL control. Assuming average expenditures per province elsewhere are equal to expenditures in Deir az-Zor, ISIL would be spending roughly $500 million per year in total.

**From Where Does the Money Come?**

Insurgencies or, in this case, proto-states, need much more money than terrorist groups. However, since the end of the Cold War, insurgencies have been increasingly on their own when it comes to financing. Financial support from foreign governments or contributions from individuals have not been important sources of funding for insurgents in the Niger River delta and for Boko Haram in Nigeria, ISIL in Syria and Iraq, or the Revolutionary Armed Forces of Colombia (FARC). These groups finance themselves by taxing or trafficking in valuable commodities and by extorting money from the local population through “taxes,” kidnapping, property theft, and threats to individuals and their families. The role of cocaine as a source of revenue for the FARC and of opium and heroin for the Taliban are cases in point.

In the case of ISIL, analysts and U.S. government officials have circulated a number of rough estimates concerning the group’s revenues. ISIL revenues from the sale of oil and refined oil products ran at $40 million in one month this year, which annualized comes to $480 million per year. Oil and refined oil products are the single most important source of income for ISIL. Sales of antiquities pillaged from sites under ISIL control may bring in as much as $100 million this year, although this number is an upper bound. Revenues from “taxes”; tolls; extortion payments from individuals, especially members of religious or ethnic groups targeted by ISIL; extortion from businesses; taking a share of salaries paid by the Iraqi government to its employees in ISIL territory; resale of stolen or expropriated cars; and similar sources of funding could run as much as $800 million in 2015. In total, these estimates suggest total annual funding in 2015 of as much as $1.2 billion.

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13 “Two Arab Countries Fall Apart,” The Economist, June 14, 2014.
16 Presentation by the Ambassador of Iraq to the United Nations, April 2015.
However, in 2015 the Iraqi government stopped making payments to civil servants and citizens in Mosul, depriving ISIL of an important source of funding. It has also lost oil fields, such as Ajil in Iraq. ISIL’s revenues will fall further if it loses control of more oil fields, if more loading facilities and tanker trucks are destroyed, as occurred in the recent Tidal Wave II operation, if the international community puts on more pressure to halt trade in antiquities, and if people continue to flee territories controlled by ISIL and economic activity continues to decline. As of December 2015, several of these conditions have come to pass, suggesting that ISIL revenues in 2016 will be lower than in 2015.

However, ISIL has substantial amounts of cash on hand. At the beginning of 2015, ISIL may have had a strategic reserve of up to $2 billion. This figure is based on $875 million that ISIL reportedly had on hand before it invaded Mosul in summer 2014. After capturing Mosul, it plundered an estimated $1 billion to $1.2 billion from banks in the territory it took over, including $425 million to $450 million stolen from the Mosul branch of the Iraqi Central Bank, as well as funds from a number of other banks in other territories it seized in Iraq. Without continued revenues from oil, at current expenditure levels, these reserves would be consumed within five years.

How Does ISIL Make Money from Oil?

ISIL has captured the main oil fields in Syria. Its hold on Iraqi oil fields is now minimal. In the past decade, total Syrian production ran between 400,000 and 500,000 barrels per day, of which production from the main fields under ISIL’s current control was about 300,000 barrels per day. However, the lack of technical knowhow and the overall chaos in Syria have prevented ISIL from maintaining production at previous levels. Currently, the production from these fields may run as low as about 40,000 barrels per day. Another source states that ISIL may be producing 50,000 barrels per day.

Crude oil is not useful until it has been refined. Entrepreneurs in ISIL-controlled territory have set up small “teapot” refineries, unsophisticated operations that heat the crude oil to separate out low-quality gasoline and diesel, which are then sold locally. These entrepreneurs are reportedly

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18 Gleser, 2015.
the most important buyers of oil from ISIL-controlled fields. Some oil finds its way to the Syrian government through intermediaries. One source estimates that the Syrian government purchases as much as 20,000 barrels per day from ISIL-controlled fields for its refineries through intermediaries.24 Iraq, including the Kurdistan Region of Iraq and disputed territories; Turkey; and parts of Syria not controlled by ISIL have been reported to be destinations for smuggled refined oil products from the small refineries in ISIL-controlled territories; neither Iraq nor Turkey appears to be important destinations for crude oil.25

Like almost all goods in Syria, all the crude oil and refined oil products under the control of ISIL are transported to buyers by truck. Before the civil war, Syria had a substantial trucking industry consisting of both fleet operators and owner-operators. The trucks that transport oil from ISIL-controlled territories are owned by these businesses. The drivers of these trucks may be the owner-operators or hired by fleet operators.

Policies to Reduce Funding for Insurgencies

Armies march on their stomachs. Without funds to pay for food, wages, and ammunition, insurgencies are hobbled as commanders are unable to launch and sustain operations. A major reason that guerrillas in El Salvador agreed to come to the negotiating table in 1991 was the end of financial and logistical support from the Soviet Union.26 In the case of ISIL, previous RAND research has shown a direct correlation between the level of spending and the pace of attacks by its predecessor group, al-Qa’ida in Iraq.27

Although ideology, especially in the case of ISIL, is the primary motivation for individuals to join insurgencies, commercial activities associated with insurgencies, like cocaine production and smuggling in Colombia or opium and heroin production in Afghanistan, can become so lucrative that they become an important motivation for some individuals engaged in insurgencies. Commercial motivations can become so entrenched that some insurgent groups keep fighting even after material motivations have replaced ideological or religious motivations.

24 Reed, 2015b.
25 Reed, 2015b.
For these reasons, policies designed to reduce funding for insurgencies can have substantial payoffs in terms of fewer resources for military operations and a reduction in commercial motivations to keep the insurgency going. To reduce ISIL revenues from oil, the U.S. government has been targeting oil field facilities, such as loading depots, and tanker trucks. It could also impose financial sanctions on businesses in the region engaged in transporting and trading oil and refined oil products sold by ISIL, like truck fleet operators and intermediaries for the Syrian regime or on any other buyers of ISIL oil. The U.S. government could also impose sanctions on banks that provide financial services for individuals and businesses associated with ISIL or businesses that engage in commercial activities, like the oil trade, that serve ISIL’s needs. This would include banks that do businesses with ISIL-associated money exchanges (hawalas), which might be beyond the reach of current U.S. sanctions laws. The U.S. government could also use oil-trading network analysis to locate and neutralize ISIL oil leadership, as it did earlier this year with ISIL oil emir Abu Sayyaf.

How Effective Are These Measures Likely to Be?

In an effort to reduce ISIL revenues, the United States has been targeting oil infrastructure, including oil loading and other facilities in oil fields controlled by ISIL, and tanker trucks hauling oil from these fields to buyers. To discourage truckers from hauling crude oil or refined oil products, the United States has leafleted truck drivers to inform them that trucks will be targeted. The United States destroyed over a hundred trucks in its first campaign, using bombs and large-caliber machine guns on A-10 Warthogs. These trucks were sitting empty, waiting their turn to be filled at loading stations. The combination of hitting oil infrastructure and tanker trucks appears to have made a major dent in ISIL oil revenues, at least for the time being. However, despite these operations, truckers have not yet completely stopped hauling crude oil or refined products.

How effective has this tactic been, and is it likely to be effective in the future? Hitting trucks remains a good tactic. Trucks are expensive. New heavy trucks cost over $100,000. Even used trucks cost tens of thousands of dollars. For any trucking business in Syria, the loss of a heavy truck would inflict a substantial financial blow. Repeated losses would eventually force the company out of business. Thus, destroying heavy trucks transporting crude oil or refined oil products should lead to a decline in the number of trucks available and hence revenues for ISIL.

Income is hard to come by in Syria; there has been no lack of individuals willing to drive trucks into ISIL-controlled territory to transport crude oil, refined oil products, or other cargos. For many,

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if not most, of these individuals, hauling oil is a commercial, not an ideological decision. Targeting trucks, even after warning drivers that they are targets, may lead to the death of some truck drivers.

Targeting oil infrastructure is also likely to lower ISIL oil revenues. This is particularly true of any infrastructure that facilitates the transfer of crude oil from the wellhead to trucks, and of any infrastructure that is expensive to replace or takes time to rebuild. While destroying a storage shed at an oilfield is unlikely to have an effect, destroying a fuel oil separator or a pumping station is likely to impair revenue flows.

Imposing financial sanctions on larger businesses—and their banks—in the region engaged in transporting and trading oil and refined oil products sold by ISIL should have a tangible, if modest effect on ISIL. Larger businesses need banking services. Moreover, business that involves ISIL is almost certainly only part of their operations. A concerted effort on the part of the U.S. Treasury to target larger businesses and their banks would likely reduce or stop their engagement with ISIL-affiliated activities, raising costs for ISIL.

Imposing sanctions on banks that provide financial services for businesses engaged with ISIL would reduce access to financial services for these enterprises, also raising costs for ISIL as the number and willingness of businesses to engage with it would decline.

Because of the severity of the punishments it inflicts and the extreme ideological positions it adopts, ISIL can be difficult to penetrate. Using oil trading networks to garner information about ISIL provides another avenue for locating the leadership.

These measures will not lead to the financial demise of ISIL. As noted above, ISIL draws on sources of income other than oil to finance its operations. Oil and refined oil products are valuable enough that light trucks, even pickups, can be used to haul smaller quantities, albeit more expensively and less efficiently than heavy trucks. The United States and its allies would be unable to target large numbers of light trucks hauling oil or refined oil products. Because light trucks are ubiquitous in Syria, targeting them could lead to civilian casualties without much effect on ISIL’s overall financial revenues.

ISIL operates heavily on cash, so measures targeting financial services although helpful will not lead to a total cutoff in funds. Smaller businesses that engage with ISIL are too small for the U.S. Treasury to target. In addition, those located on territory controlled by ISIL are subject to coercion, making it almost impossible for them to refuse to conduct business with ISIL.
Conclusions

Measures to reduce funding for ISIL are an important component of a strategy to degrade ISIL and end its control of territories in Iraq and eventually Syria. Revenues from sales of oil and refined oil products are the most important single source of recurrent revenues for ISIL. Provided the tactic is sustained, targeting oil loading facilities and heavy trucks hauling crude oil and refined oil products is a useful tool to reduce ISIL revenues. Although this tactic alone will not lead to the demise of ISIL, it can weaken it.

Thank you Chairman Murkowski, Ranking Member Cantwell, and members of this committee for the opportunity to testify before you this morning. I look forward to answering your questions.
STATEMENT OF PETER HARRELL, ADJUNCT SENIOR FELLOW,
ENERGY, ECONOMICS, AND SECURITY PROGRAM, CENTER
FOR A NEW AMERICAN SECURITY

Mr. Harrell. Thank you very much.

Chairwoman Murkowski, Ranking Member Cantwell, honorable members of the Committee, thank you for inviting me here today to testify. It's a privilege to be able to share my perspectives with you on the subject of today's hearing, Terrorism and the Global Oil Markets.

I intend to focus my spoken remarks today on the Islamic State's oil trade which, as Dr. Crane said, is a principle source of revenue for the terrorist organization and one that must be shut down.

I'm going to keep my spoken remarks brief but have submitted a longer statement for the record.

In my view oil is actually, probably, the second largest source of revenue for the Islamic State when you add up all of the things that Dr. Crane said as other, I think, that those probably amount to slightly more than the oil revenue.

To give just one example of the scale of what it is in the other category of ISIL revenue. Treasury Assistant Secretary Daniel Glaser estimated earlier this year, based on intelligence the U.S. Government had received, that ISIL has managed to loop between $500 million and $1 billion in cash out of bank vaults that they have opened in ISIL territory. But clearly you add back the taxes, the extortion that they're able to get, all told, a very significant source of revenue. But clearly the oil revenues are also critically important to ISIL.

Like Dr. Crane, I estimate that the Islamic State earns about $500 million per year from the oil trade, mostly through the sale of crude oil in Syria. Most, if not all of the Islamic States' oil production occurs at small wells in Syria. There may be a small amount of oil production in Iraq, but the vast majority occurs in Syria.

The oil is sold by ISIL at the well head for perhaps between $15 and $40 per barrel. It's sold to independent distributors who then onward sell it to these small refiners that Dr. Crane talked about or move it on elsewhere in ISIL territory.

According to most estimates, ISIL is earning between $1 and $1.5 million per day in oil revenue. I should say those estimates are up to about three, four weeks ago when the U.S. Military began its escalated campaign against oil targets. And until about three or four weeks ago those estimates had been remarkably stable for about a year. If you look back a year ago the estimates were a million or slightly more per day and if you look three or four weeks ago, you were looking at broadly stable oil revenues in ISIL territory.

As Dr. Crane said, this is not high tech business. These are very rudimentary kinds of techniques ISIS is using in order to extract the oil and what its refiners and distributors are using to refine and distribute it.
I assess that most of the oil produced in ISIS territory is consumed in ISIS territory. There are more than five million people living in that territory. There is certainly ample, local demand to consume virtually all of that production.

That said, there is clearly some smuggling that is occurring, sales to the Assad regime. The sales to the Assad regime are actually, probably, more natural gas than crude oil. And there’s also ample evidence of smuggling into Turkey into the Kurdish autonomous regions of Iraq and potentially into Jordan as well. I assess that most of that oil that’s smuggled out is also consumed locally in those countries and is not entering in any meaningful way, global oil markets.

So what can the U.S. Government and our coalition partners do to further attack this oil revenue? I think that the single most important step that the U.S. Government can take is to continue to escalate the military targeting of ISIL oil installations and the distribution network. The fact is the oil is being sold in ISIS’ territory. It’s being sold for cash. There’s not a lot of leverage that international sanctions can have on those operations that take place within their own territory and taking out the infrastructure is probably the most important step we can take.

That said, there is, as I mentioned, obviously, some smuggling that is occurring into adjacent countries. I think the adjacent countries such as Turkey and the Kurdish autonomous government in Iraq need to step up their efforts to crack down on oil. Currently they’re turning back trucks where they can.

Though smuggling is continuing I think those countries should increase their efforts by moving toward a posture of seizing and destroying both the trucks that are exiting and the oil that is exiting to create a deterrent rather than the current situation where the trucks will maybe be turned back at the border. They’ll wait a day or two and then try again to be smuggled across.

Third, I think that we need to escalate our efforts to target ISIS’ ability using sanctions to import replacement oil equipment. As ISIS suffers more bombing of its oil equipment it will look to procure replacement parts. The region is, of course, awash in replacement parts, but I think there are sanctions efforts that the U.S. Government and our allies can take to prevent those replacement parts from flowing into ISIS territory.

In closing I would just note that while I’ve focused my remarks today on ISIS and the oil trade, there are clearly, as both the Chairwoman and the Ranking Member mentioned, other linkages between terrorism and global oil markets that need to be considered as we look at the global oil security posture.

And I’d like to thank you very much for inviting me again here to speak.

[The prepared statement of Mr. Harrell follows:]
Testimony before the U.S. Senate Committee on Energy and Natural Resources
Hearing to examine terrorism and the global oil markets.

Peter E. Harrell, Adjunct Senior Fellow, Energy, Economics, and Security Program
Center for a New American Security

Chairwoman Markowski, Ranking Member Cantwell, honorable members of the Senate Committee on Energy and Natural Resources, thank you for inviting me to testify on this panel. It is a privilege to be able to share perspectives with you on the subject of today's hearing, "Terrorism and the Global Oil Markets."

Events of the past month, including the November 13 terrorist attacks in Paris and the terrorist attack on December 2 in San Bernardino, California, have brought home that the United States today faces no greater terrorist threat than the Islamic State. Between the Islamic State's base in Syria and Iraq and its ability to use the internet and online communications to organize and inspire terrorist attacks around the world, the Islamic State has become the leading force of the global jihadi movement. The United States and our allies must defeat it.

Defeating the Islamic State will require us to apply the full range of American power: military, economic, and diplomatic. We must work with allies and partners to defeat ISIS on the battlefield in the Middle East; to sanction ISIS's sources of revenue and deny ISIS the ability to procure supplies and move funds around the world; to enlist the support of allies and partners to build a broad international coalition to fight ISIS; and to turn potential ISIS sympathizers around the world and here at home away from ISIS's radical ideology.

I have studied ISIS's finances for nearly two years, beginning in 2014 when I had the honor of serving at the State Department as the Deputy Assistant Secretary for Counter Threat Finance and Sanctions and, along with Treasury Official Danny Glazer, served as co-Chair of the U.S. government working group to counter ISIS financing. This year, with the Center for a New American Security, I have conducted extensive research on ISIS's finances and written and spoken about ISIS's financial operations.

I intend to focus my remarks today on the Islamic State's oil trade, which is a principal source of revenue for the terrorist organization and one that must be shut down. But before describing the Islamic State's oil trade in detail and recommending several steps to combat it, I would like to place the Islamic State's oil business into the broader context of ISIS's overall financial picture.
ISIS Financial Overview

ISIS is the best-funded terrorist organization in history, drawing income from several sources. Unlike many of the other terrorist groups the U.S. has fought, which raise funds principally from external sources like donations, criminal smuggling, or kidnapping for ransom, ISIS derives its income principally from the territory it controls in Syria and Iraq.

The single largest source of ISIS revenue to date appears to be robbery and taxation of the people and businesses that live and operate in ISIS-controlled territory. The U.S. Treasury Department has estimated that ISIS has seized at least $500 million and potentially up to $1 billion by looting bank vaults in territories under ISIS control, including the Mosul branch of the Iraqi Central Bank. In addition, ISIS extorts taxes from the people who live in its territory amounting to hundreds of millions of dollars per year or more. According to press reports and U.S. government officials, this extortion includes payments that ISIS skimmed off of Iraqi government salary payments to Iraqi civil servants in ISIS-controlled territory (at least prior to July 2015 when the Iraqi government at least temporarily ceased paying some salaries in ISIS-controlled territory). ISIS also has a robust system in place to tax local business owners, collect road tolls, charge for electricity and other services, and to collect other fees from the people who suffer under its rule.

Turning to oil revenue, which is the second largest source of ISIS funding, there is a widespread consensus that, at least prior to the escalated coalition airstrikes against ISIS oil targets that began last month, ISIS has been earning between $1 million and $1.5 million per day from its oil industry. For example, Treasury Assistant Secretary Daniel Glaser estimated in July 2015 that ISIS pulls in $40 million per month, or approximately $500 million per year, from oil. Glaser indicated that this estimate was based on information collected during the May 2015 raid against Abu Sayaf, an ISIS financial official who managed much of ISIS’s oil enterprise. U.S. government officials and newspaper accounts have indicated that the raid provided a treasure trove of information on ISIS’s financial operations. In October of this year, an independent analysis of ISIS oil revenues by journalists and researchers from the Financial Times, using estimates of ISIS oil production and sales prices of crude oil in ISIS territory, also reached the conclusion that ISIS made roughly $1.5 million per day from oil sales. And a just released IHS study of ISIS’s current revenue estimated that oil and natural gas sales accounted for 43% of ISIS’s $80 million monthly revenue, or just over $1 million per day.

Aside from extortion/taxation and oil revenues, ISIS derives income from kidnapping for ransom, looting antiquities and selling them on international markets, other criminal activity, and by raising money from donors and financiers in the Middle East and beyond. These other sources of revenue,

ISIS’s Oil Enterprise

There are three key facts that need to be understood in order to develop an effective strategy to disrupt ISIS’s oil revenue: First, ISIS’s oil infrastructure is technically simple—this is low-tech oil production and oil refining. Second, the bulk of oil produced within ISIS-controlled territory is consumed within ISIS-controlled territory. As a result, ISIS generates most of its oil revenue indigenously from the territory it controls, not from selling oil to buyers in Turkey, Iraq, or other countries susceptible to U.S. sanctions pressure. Third, ISIS has proved to be an adaptable adversary, adjusting its oil operations to military strikes and other coalition pressure. I will elaborate on each of these issues in detail.

Let me begin by providing some basic estimates of the scale of ISIS’s oil enterprise: Estimates of oil production in ISIS territory, prior to the escalated bombing of ISIS oil infrastructure that began last month, generally run between 40,000 and 60,000 barrels per day, with production concentrated in Syria’s Deir Ezzor province. U.S. government officials have estimated that ISIS produces at least 40,000 barrels per day, virtually all of it in Syria, while an in-depth investigation by the Financial Times in October 2015 estimated that ISIS produces between 34,000 and 40,000 barrels per day in Syria and approximately another 8,000 barrels per day in Iraq. These volumes are significant, but a dramatic decline from the volumes of oil produced in the same fields prior to ISIS’s rise. For example, Syria’s total oil production prior to the current war was approximately 585,000 barrels of oil per day. As I said earlier, estimates of ISIS’s revenue from its oil generally run over $1 million per day, or some $500 million per year.

The operations that produce oil within ISIS territory are low-tech. The primary oilfields under ISIS control in Syria are simple, straightforward to operate, and rich in oil resources. Industry experts describe the fields as ones where oil essentially rises to the surface when tapped by basic pipes, and the oil can be lifted into trucks by simple pumps or, in a pinch, buckets. Furthermore, ISIS has shown that it has the expertise needed to repair damage done to the fields following limited military strikes. Indeed, I have heard anecdotal reports that ISIS can repair some individual bombed wellheads in as little as 24-48 hours after a coalition strike. I have also heard reports that ISIS has taken to busing repair technicians near wellheads in order to expedite repairs and return wellheads to operation.

2 Johnson, Focusing and Bombard, “Inside ISIS Inc.: The Journey of a Barrel of Oil.”
The refineries that operate in ISIS territory are also low-tech enterprises, often little more than home-crude oil stills that refine crude by boiling it to produce low-grade diesel and other fuels for sale. Estimates are that hundreds if not thousands of these refineries have been built in ISIS territory over the past two years, and publicly available aerial imagery shows them scattered throughout the Syrian desert. These refineries are built using equipment widely available in the region and can be readily repaired or rebuilt in case of damage.

Finally, the transportation of crude oil and refined petroleum products in ISIS territory does not involve complex equipment. Oil is generally shipped by trucks that have had tanks welded onto them, or by general-purpose utility trucks that simply carry oil in stacked barrels or in plastic jugs.

ISIS appears to control wellheads directly and profits from the sale of oil from them. It also appears to maintain control of many of the larger oil and gas facilities in territory under its control. However, while ISIS maintains direct control of oil production inside its territory, ISIS does not appear to directly operate the distribution network for oil in its territory. Instead, ISIS sells oil at the wellhead to independent distributors, who load crude oil into trucks and either sell the oil to local small refineries or on to other middlemen who distribute it further afield. Public reports suggest ISIS may charge anywhere between $15 and $45 per barrel at the wellhead, depending on the quality of the oil and local market conditions. Although ISIS does not directly control this distribution of crude oil and refined product, ISIS is able to generate additional revenue from the oil distribution network by charging road tolls to trucks and by taxing fuel merchants. I should note that ISIS oil trade is heavily cash based, with purchasers paying cash at the wellhead and refiners and distributors operating largely on a cash basis—this is not a business with significant linkages to banks or other financial institutions.

I estimate that the bulk of the oil produced in ISIS territory is consumed within ISIS territory. Five or six million people live in ISIS's territory, including several significant cities in both Iraq and Syria, such as Raqqa, Palmyra, and Mosul. Assuming ISIS territory produces 45,000 barrels of crude oil per day, oil production would amount to only about a third of one gallon of crude oil per resident per day—a quantity that could be easily consumed by local needs. There are numerous reports of thriving fuel markets inside ISIS territory, including trade of Syrian origin oil being transported into ISIS territory in Iraq, and ISIS also needs fuel to support its own military operations. In addition, since most of the ISIS crude oil is refined in primitive local refineries, the diesel and other oil products made in ISIS territory are generally low-grade and unattractive in markets where higher-grade products are also available.

The fact that a majority of ISIS-origin oil is consumed within ISIS's own territory, however, does not mean that there is no smuggling of ISIS oil into adjacent territory: there clearly is cross-border smuggling, and the U.S. and our partners need to take steps to curtail it.

To give just a couple of examples of cross-border smuggling, journalists in Turkey and Syria have documented trucks, stock animals, and individual people hauling containers of oil across the border...
and using informal pipe networks that straddle the border to send oil from ISIS territory into Turkey.\textsuperscript{11} There have been similar reports of oil flows from ISIS territory into the Kurdish Autonomous Region in northern Iraq. I should note, however, that there is not credible evidence to support Russia’s recent allegation of “industrial scale” oil trade between ISIS and Turkey, either directly or through the Kurdish Autonomous Region in Iraq. Nor is there credible evidence that meaningful quantities of oil smuggled into Turkey from ISIS territory are entering global energy markets. Instead, it appears likely that oil smuggling into Turkey and KRG territory occurs at a local scale and that the smuggled products are consumed locally.

Oil is also moving from ISIS-controlled territory into territory controlled by the Assad regime, which is not surprising given that the Assad regime has lost control of most major Syrian oilfields to ISIS. Just last month, on November 25, the Treasury Department sanctioned a Syrian businessman, George Haiwari, for serving as a middleman for Syrian regime oil purchases from ISIS.\textsuperscript{12}

In addition to oil, ISIS is in the natural gas business in Syria. Over the last year, ISIS captured important Syrian natural gas fields, including near the Syrian city of Palmyra, and appears to be continuing to produce natural gas, though at levels well below Syria’s pre-war natural gas production.\textsuperscript{13} Multiple sources indicate that ISIS sells natural gas to the Assad regime, largely to fuel electricity production, and that there are sources that the natural gas trade between ISIS and the Assad regime is at this point significantly larger than the oil trade between them.\textsuperscript{14}

It is important to remember that the oil industry provides ISIS with benefits in addition to cash revenue. The oil industry employs thousands of truckers, refiners, and merchants in ISIS territory, creating wealth that ISIS can tax and maintain a semblance of economic order. ISIS also depends on oil and natural gas for its own electricity production and on oil to power the trucks and other vehicles that ISIS relies on to support military operations in Syria and Iraq. I think there is also a harder-to-quantify propaganda benefit that ISIS derives from managing its oil enterprise, which ISIS can use to project the image that it is succeeding in its quest to establish a modern-day caliphate.

**Recommended Actions:**

Over the past year, the U.S. and our coalition partners have taken several important steps to begin fighting ISIS’s oil enterprise. U.S. sanctions programs today give the U.S. government the authority to sanction companies trading with ISIS, including oil trade. U.N. Security Council Resolutions 2070 (2014) and 2199 (2015) highlight ISIS’s oil revenues and direct all states to take steps to ensure that

\textsuperscript{11} Mike Giglio, “This is How ISIS Smuggles Oil,” "Foreign Policy," November 3, 2014, http://www.foreignpolicy.com/articles/this-is-how-isis-smuggles oil#iрапССn.


\textsuperscript{14} "The Financial Times has reported publicly on this issue. Solomon, Koong and Bernard, “Inside ISIS Inc.: The Journey of a Barrel of Oil.”
they are not facilitating ISIS's oil trade. The U.S. government and our allies have launched an international working group to counter ISIS financing, which provides a valuable forum to share information and develop a collective strategy to pressure ISIS revenues, including oil. Next week, Treasury Secretary Jack Lew will preside over a meeting of U.N. Security Council Finance Members to coordinate strategy in countering ISIS finance.

Unfortunately, however, we also have to acknowledge that U.S. and coalition efforts to date have had at most limited success in actually reducing ISIS oil revenues. The current estimates of $1 million to $1.5 million per day are largely unchanged from an estimate of $1 million per day that then-Treasury Under Secretary David Cohen estimated ISIS earned from the oil trade over a year ago, in November 2014. The early phases of the U.S. military campaign against ISIS oil infrastructure that began in 2014—prior to the escalated strikes that began last month—appear to have had little systematic impact on ISIS oil infrastructure as ISIS adapted to the strikes and developed the expertise to quickly repair damaged infrastructure. The U.S. and our allies have had some success in pressuring Turkey and the Kurdish Regional Government in Iraq to increase border enforcement to stop oil smuggling from ISIS territory, but, as I have discussed, only a minority of ISIS oil production is smuggled out of ISIS territory at the first place.

Saying that the U.S. government has had only limited success in fighting ISIS’s oil revenues is not to say that the U.S. has had no success in countering ISIS financing more generally; the U.S. has achieved important progress on some issues. For example, the Treasury and State Departments have brought significant pressure to bear to ensure that ISIS is not able to access the international banking system from its territory in Iraq and Syria and to crack down on money changers and exchange houses that either deliberately or blindly help ISIS move cash into and out of its territory. The U.S. government, the Financial Action Task Force, and other regulatory bodies have also engaged with banks and money service businesses to restrict the flows of funds related to foreign fighters who travel to Syria and Iraq to join ISIS. But the fact remains that our efforts to combat ISIS’s ability to generate funds within its own territory have had limited impact.

Clearly, more needs to be done. What steps can the U.S. and our coalition partners take?

First, the single most important step that the U.S. government can take to undercut ISIS’s oil and gas revenue is to keep escalating the military action against oil and gas targets in ISIS territory. ISIS generates most of its oil revenues in cash from operations within the territory it controls, limiting the ability of financial sanctions and other traditional counter terrorist finance tools to attack this source of ISIS revenue. Instead, we need to impact ISIS’s oil enterprise where it occurs, inside ISIS territory in Syria and, to a lesser extent, Iraq.

One of the lessons of the last year is that limited strikes on ISIS’s oil infrastructure are not strategically effective over time, given ISIS’s ability to repair wellheads and build new low-tech refineries. The recent U.S. and coalition campaigns to strike tanker trucks is a valuable escalation of military pressure that is already disrupting ISIS’s oil operations and making it harder for ISIS to earn

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oil revenue. I also commend the military’s recent decision to begin striking larger pieces of ISIS’s oil infrastructure that are more difficult to repair or replace, such the November 2015 strikes against oil and gas separation plants in ISIS territory. Comprehensive bombing of these facilities is an important tool to shut down ISIS’s oil enterprise.

But more needs to be done. Strikes against tanker trucks, like strikes against oil infrastructure, must be sustained in a widespread way over time—or else the oil distributors operating in ISIS territory will simply be able to acquire replacement trucks and get back to business. Strikes on oil infrastructure need to be comprehensive, not limited. While I understand that government officials have concerns about avoiding permanent damage to Syrian oil infrastructure given that oil will be a key piece of rebuilding a post-conflict Syria, those long-term concerns should not outweigh the immediate need to put ISIS’s oil enterprise out of business.

The U.S. should also look at further widening the set of military targets and considering installations like the cash accounting houses where ISIS stores its oil proceeds and other revenues. Raids against high value targets, like the May raid on Abu Sayaf, should also be considered. Some of these targets may ultimately prove infeasible given intelligence gaps and the potential for disproportionate civilian casualties. But the U.S. military and our coalition partners should target ISIS’s oil infrastructure to the maximum extent possible and there should be no part of ISIS’s oil enterprise where people feel safe to work.

Second, the U.S. government should continue to put pressure on Turkey and the Kurdish Regional government in northern Iraq to crack down on the oil smuggling that does exist. The fact that most ISIS oil is consumed within ISIS’s own territory does not mean that smuggling is not a problem clearly, any oil entering ISIS territory brings revenue into ISIS territory and should be stopped. The U.S. should continue to put pressure on regional governments to fully seal their borders to oil smuggling and it should offer technical assistance on counter-smuggling controls. Regional governments, meanwhile, should adopt a zero-tolerance policy for oil and oil trucks trying to cross from ISIS-controlled territory. Trucks and oil should not simply be turned back—only to attempt a subsequent border crossing in the future. Instead, trucks and oil seeking to leave ISIS-controlled territory should be seized and destroyed in order to increase costs against ISIS oil smuggling. U.S. officials, meanwhile, should continue working to identify oil smugglers for sanctions; sanctions against even one or two oil smuggling networks would have an important deterrent effect. The U.S. should also continue its sanctions and other efforts to highlight and expose the links between ISIS’s oil enterprise and the Assad regime.

Third, the U.S. and our allies need to escalate our efforts to target the flow of oil-related equipment to ISIS territory. As the U.S. and our coalition partners increase military strikes against ISIS oil infrastructure, ISIS will increasingly seek to procure replacement oil equipment. The U.S. needs a robust campaign to sanction ISIS procurement networks and to reach out to businesses in Iraq, Turkey, and elsewhere in the region to ensure that they are taking appropriate steps to avoid selling oil equipment to ISIS-linked buyers. This will not be an easy task, given that the region is awash in oil equipment, that much of the equipment is not heavily regulated, and that identifying the grey- and black-market dealers who sell to ISIS is not straightforward. But it is important that the U.S. and our coalition partners do not simply allow ISIS to repair and replace infrastructure damaged by U.S. airstrikes.
In addition to direct outreach and targeted sanctions, a practical step would be to use a future U.N. Security Council resolution to prohibit the transfer of any oil-related equipment to ISIS territory and authorizing states to seize and destroy oil equipment bound for ISIS territory. Current resolutions prohibit the sale of such equipment to ISIS, but a broader prohibition on the sale of such equipment to ISIS territory would be easier to enforce and would help address potential legal issues that limit governments’ ability to restrict the export of such goods to ISIS territory.

Finally, U.S. and coalition efforts to fight ISIS’s oil revenues cannot and should not be addressed in a vacuum. They must be embedded in a comprehensive strategy to fight all of ISIS’s primary funding streams. This should include an overall expanded military campaign against ISIS economic targets and continued robust sanctions enforcement.

Other Linkages Between Terrorism and the Global Oil Trade:

Although I have focused my remarks to the Committee today on ISIS and its ability to generate revenue from the oil trade in Syria and Iraq, I should briefly note that the experience with ISIS’s oil enterprise is by no means the first time terrorism has intersected with the global oil trade. While ISIS is the first terrorist group to effectively operate its own ongoing oil industry, there is a long and disrupting history of linkages between terrorist organizations and the global oil industry. These connections include:

- **Kidnapping for ransom (KFR) of oil workers:** Kidnapping for ransom is a major source of revenue for terrorist organizations globally. Oil industry employees work in some of the most politically unstable parts of the planet and have often been targeted for kidnapping, despite the rigorous efforts of oil companies to protect their employees. In recent years, for example, oil workers have been kidnapped in Colombia, Libya, Nigeria, and Algeria, among other countries. While it is often difficult to identify reliable information about specific ransom payments, the specific groups ransoms are paid to, and indeed whether a ransom was even paid to secure a hostage’s release, oil workers certainly make attractive targets for terrorist groups seeking to generate funds through KFR.

- **Terrorist attacks targeting oil infrastructure:** Key oil infrastructure has long been a potential target for terrorist attacks, either to prevent governments or rival groups from generating revenue or to disrupt markets. This year, for example, ISIS’s Libyan affiliate has launched multiple attacks against Libyan oil infrastructure, apparently in an effort to damage facilities and prevent other groups from profiting from Libya’s oil wealth. And there has long been concern that major terrorist attacks against key global energy infrastructure installations could disrupt global oil markets and have significant price and economic ramifications.

- **State sponsors of terrorism:** Finally, although ISIS is the first terrorist group to manage its own ongoing oil industry, all three of the currently designated State Sponsors of Terrorism, Iran, Syria, and Sudan, have significant oil industries—though as discussed, much of Syria’s oil industry is now under ISIS control. Any comprehensive examination of the links between
terrorism and global oil markets must also consider how oil sales affect these countries’ ability to support terrorist activities.

**Conclusion:**

Senator Markowski, Senator Cantwell, and other distinguished members of the Committee, in closing I would like to thank you again for giving me the opportunity to speak today as a member of such a distinguished panel. Attacking ISIS’s oil enterprise is not a simple task, and, by itself, will not defeat ISIS. Steps to attack ISIS’s oil enterprise are, however, a critically important element in an overall strategy to end this terrorist movement.

I would be honored to answer any questions.
The CHAIRMAN. Thank you, Mr. Harrell.
Dr. Vakhshouri.

STATEMENT OF DR. SARA VAKHSHOURI, PRESIDENT, SVB ENERGY INTERNATIONAL, AND NON-RESIDENT SENIOR FELLOW, GLOBAL ENERGY CENTER, ATLANTIC COUNCIL

Dr. VAKHSHOURI. Thank you, Chair Murkowski, Ranking Member Cantwell and members of the Committee. I would like to thank you for the opportunity you give me to be here before your Committee and discuss the important issue you posed. I'm looking forward to discussing this issue. I'm going to focus my remarks today on Iran's oil policy and return to the global oil market. I also should mention that this testimony and my remarks are only my own views and not the Atlantic Council's.

Iran and Western powers after a decade of dispute over Tehran's nuclear program reached a final agreement in July 14, 2015. And Iran being under different sanctions, economic and energy sanctions, is now getting ready to reintegrate into the energy market.

In 2012 the EU put a ban on import of Iranian crude oil, also some complementary sanctions on ensuring the tankers that were carrying Iranian crude oil. These sanctions were coupled with U.S. sanctions on Iran's oil revenue and export, and all of these caused Iran's oil export to cut by half.

Iran's oil export in 2011 was about 2.5 million per barrel and it dropped to 1.5 million barrels per day in 2012. Also their production cut by 17 percent in compared to prior 2011.

The overall sanctions, nuclear-related sanctions, that were posed on Iran since 2012 the investment of upstream both oil and gas in Iran were hurt. However, still Iran, despite of all the sanctions, was successful to increase its natural gas production. And in 2014, for the first time, the balance of its natural gas trade was positive.

After the nuclear deal Iran is going to come back to the market with totally different approach. Iran had witnessed, despite all of its oil and gas resources, it witnessed many ups and downs with its relation to national oil companies and countries. So every time, in response to the challenges it was facing, it came out with more, with a policy and attitude of being more resilient. And this is going to be the case this time too.

Iran's supreme leader in 2014 announced the idea of economy of resistance. Economy of resistance was in response to 2012 sanctions that reduce Iran's oil export and oil revenue. The most goal and aim of the economy of resistance would be to create more value added domestically by processing crude oil and natural gas domestically and export the product instead of the raw material.

Therefore we are not going to see a huge amount of export from Iranian both on the gas and oil side come into the market after the nuclear deal, also in the long term in the next decade. Iran's most focus would be on refinery capacity downstream and also on petrochemical side. So these are the important measures that Iran is going to take in order to reduce its dependency on its crude oil revenue.

The current status of Iran's oil and gas fields indicate that Iran is producing 2.9 million barrels per day of crude oil today, and its
NGL, natural gas liquid, and condensate production is about 692 to 700, about 700,000 barrels per day.

Iran's plan is to—the plans after the deal. Its production is going to gradually rebound. We're expecting by mid next year, in 2016, Iran's crude oil production to reach about 500, 400 to 500 more than what is today. And they're going to have additional 200,000 barrels of crude oil condensate.

The Iran oil minister is expected to announce that Iran is going to increase its export about 500,000 barrels per day, a day after the sanctions are removed and 500,000 barrels per day in the next six months.

But as I mentioned, in the long-term Iran is going to increase mostly its natural gas. The focus would be on natural gas because it's going to produce more condensate. The condensate has more value that its crude oil. And it's going to use it as a feeding stock of its petrochemical factory and also can convert it into electricity for domestic use and international and for export too.

So what would be important is that if Iran comes out of the isolation it's not going to be dependent on its oil export revenue as much as it was before.

The Energy Information Administration forecast indicates that prior to 2011 Iran's net oil revenue from its oil export was about $92 million, billion, per year, but this number dropped to $65 billion after that.

And also one thing that is important is the very low cost of production in Iran and their reform of their upstream investment regulation that could create incentives and opportunities for investors to invest in Iran considering a very low oil prices.

Also, Iran has access by land to neighboring countries and could be potentially a transit point for the energy production and especially the oil and gas production in the Northern Caspian for countries like Azerbaijan or Kazakhstan.

My other, fellow panelists already mentioned in detail about the Middle East oil being threatened by ISIS and terrorist groups. Iran could potentially be a transit point and this could make Iran a significant point for import and export of crude oil to these countries.

The other issue that would be important is that Iran is going to expand its electricity export to these countries, neighboring countries like Iraq or Afghanistan or Pakistan so the number of countries even neighboring countries, even Turkey. So export of electricity instead of export of natural gas or crude oil would also be significant.

Once again I would like to thank you for having me here today. And I'm looking forward to the questions.

[The prepared statement of Dr. Vakhshouri follows:]
Statement before the Senate
Energy and Natural Resources Committee

“Terrorism and Global Oil Markets”

A Statement by:

Sara Vakhshouri, Ph.D.
President, SVB Energy International and Non-Resident Senior Fellow, Global Energy Center, Atlantic Council

December 10, 2015
366 Dirksen Senate Office Building
By Sara Vakhshouri, Ph.D., President, SVB Energy International and Non-Resident Senior Fellow, Global Energy Center, Atlantic Council

‘Iran’s Energy Policy and Return to the global Energy Market’

Chair Murkowski, Ranking Member Cantwell and members of the committee, thank you very much for the opportunity to appear before your Committee today and to discuss the important issue you have posed. I will focus my remarks on Iran’s Energy Policy and Return to the global Energy Market.

Iran and Western Powers after more than a decade of dispute over Tehran’s nuclear program, reached to a final agreement in July 14, 2015. Iran tackling with different types of economic and energy sanctions is now getting ready to re-integrate into the global economy and energy market.

The EU oil embargo, coupled with US sanctions in 2012, created real challenges for Iran’s oil production, export capacity and market access. The cutting in half of Iran’s total oil exports, coupled with inadequate storage capacity, forced the National Iranian Oil Company (NIOC) to reduce its crude oil and condensate production up to 17 percent and to shut down some of its fields. In 2012, the average export of Iran oil declined by 40 percent, from 2.5 million barrels a day (mb/d) in 2011 to about 1.5 mb/d in 2012. By 2014, Iran’s position in the OPEC had fallen to the seventh exporter after Saudi Arabia, Iraq, the United Arab Emirates (UAE), Nigeria, Kuwait, and Angola. The latest status of Iranian oil and gas fields indicate that Iran’s current crude oil production is about 2.9 mb/d, and natural gas liquids (NGL) and condensate production has stayed level at about 692,000-710,000 b/d. Out of this 2.9 mb/d, Iran consumed about 1.7-1.9 mb/d domestically and exported about 1-1.2 mb/d.

The nuclear related sanctions have had a general impact on the investment and progress of the upstream oil and gas projects but did not specifically target Iran’s natural gas exports. Nevertheless Iran was able to increase its natural gas production since 2012, in spite of sanctions. In 2014, Iran’s natural gas production increased and its natural gas trade balance was positive for the first time.

Iran’s Post Nuclear Deal Energy Policy

Iran, with its huge oil and gas reserves, has witnessed many ups and downs in its relations with other countries and international oil companies. In response to each challenge, Iran’s energy policy changed, shifting toward self-reliance. After the 1979 Islamic Revolution, years of sanctions and war prevented the energy industry from having continuous access to the necessary investment and technology. Furthermore since 2012, sanctions against Iran’s energy industry and oil exports intensified, due to conflict surrounding Iran’s nuclear program. In 2014, Iran’s Leader Ayatollah Khamenei announced the idea of the “Economy of Resistance.”
with the aim of reducing dependency on oil revenue, and increasing value-added production by processing raw material domestically and exporting the processed material. Therefore, focusing on the downstream and refinery sector, as well as the petrochemical sector, will be a major component of Iran's energy industry after the nuclear deal and in the next decade.

In regards to oil production, Iran will try to regain its pre-2012 crude oil production level of 4 mb/d and its lost market share of 2.5 mb/d of export. National Iranian Oil Company (NIOC) seeks to achieve this by implementing reinjection techniques utilizing water or natural gas, and by developing new fields.

Development of natural gas fields and increase of its natural gas production capacity is at highest priority of NIOC. South Pars, the giant non-associate gas field shared by Iran and Qatar, is the top priority. The advantages of increasing natural gas capacity are many. Iran can utilize natural gas production for: generating its domestic electricity needs; feedstock of its petrochemical factories; re-injecting natural gas to its mature oilfields to increase its oil production; signing long-term natural gas export contracts with international partners; or converting it to electricity for export to neighboring countries.

As a byproduct of natural gas, condensate creates other significant advantages for Iran. The value and international prices for condensate is higher than Iran's heavy and sour crude oil. There is also far less intense competition in the condensate market than does in crude oil. Iran could also process its condensate domestically, and produce light distillate products like gasoline for domestic use and export.

Creating long-term energy trade ties and engaging international investors for longer periods of time are other important elements of Iran's energy diplomacy. Tehran is planning to strengthen its economic and energy ties with its Arab neighbors and its North Caspian neighbors by exporting oil, gas, refined petroleum products, and electricity. Also, by modifying its upstream investment contracts, Iran would create longer ties with international investors. It's noteworthy that Iran has revised its upstream investment regulations with the goal of increasing the incentives for the international investors. One significant change in the new contracts is the increase in duration of the agreement from 5-7 years to about 20-25 years. NIOC's goal is to increase the quality of work and protect its oil and gas reservoirs by engaging the international companies for longer periods of time. This also on the other hand will give the investors a more vested stake and interest in Iran and could create political advantages for the country.

Investment Requirements

Iran's fifth five-year economic plan (March 2011 to March 2016), aimed to increase the country's oil production to from 4 mb/d to 5.152 mb/d by attracting $155 billion of investment to its upstream oil and gas industry. It is also estimated that a total investment of about $200-250 billion is needed to address Iran's whole oil and gas industry, including upstream exploration and production, downstream,
petrochemicals, midstream, and shipping. However Iran could not obtain the required investment due to the international sanctions.

For its mid-term production goals Iran needs about $50 billion of investment; $30 billion of it would be for South Pars natural gas development plans, and at least $20 billion to complete its ongoing oil development projects in the West Karun reservoirs within the next two to three years. Iran's National Development Fund (NDF) approved a $20 billion allocation for investment in West Karun, and the remaining funds would need to come from foreign investment.

Impacts of Iran Return to the Energy Market

As mentioned earlier, market expects that Iran's oil supply will gradually rebound upon the sanction removal. Depending on the timeline of the sanctions-unwinding process, Iran could increase its exports of crude oil about 400,000-500,000 kb/d by mid to end of 2016. Iran could also add an additional 150,000-200,000 b/d of condensate to its liquid export volumes by mid-2016. Iran's petroleum minister announced that he is ready to add 500,000 b/d of oil to its export upon the removal of sanctions, and an additional 500,000 by mid-2016, and part of this additional oil would be condensate. At the same time, the sanctions rollback on Iran, and the prospect of the country oil production hike, could have an immediate, psychological impact and downward effect on the international oil prices.

In the mid to long-term Iran's main focus will be the development of its natural gas fields, particularly the South Pars gas field. Iran's natural gas and condensate production is expected to rise significantly in the next 3-5 years. Iran is going to utilize its additional natural gas capacity in different ways: 1) To export natural gas, particularly to its neighbors, in order to increase its gas export market share and also as part of its energy diplomacy to create long-term energy alliance; 2) To use its natural gas as the feedstock of its refinery plants. Iran's current petrochemical production capacity is about 60 million tons/year, and the country is planning to increase this capacity to 180 million tons/year by the end of 2025. 3) To convert part of its natural gas into electricity and export electricity to its neighboring countries, with the goal of increasing the value added to its natural gas and also diversifying its exports products. This diversifies Iran's options for utilizing its natural gas, at a time of the oversupply in the market and low energy prices and also creates stronger trade ties and alliances with Iran's consumers and neighbors. Iran plans to allocate 6 bcm of its natural gas for conversion to electricity by 2020, which yields additional 5,000 megawatts of electricity per year, solely for export. Iran current electricity generation capacity is about 74,000 megawatts per year.

Iran's condensate production will also increase to 1 million b/d by 2017, and Iran is planning to increase its condensate refinery capacity by the next 2-3 years, in order to refine most of its condensate domestically and export the refined products instead of condensate. Iran plans to increase its oil refinery capacity to 2 mb/d, and to expand its condensate refinery capacity to 1 mb/d by 2020, thereby reaching a total refinery capacity of 3 mb/d. NIOC is almost on track to meet this goal; by the
end of 2014, Iran reached its nominal oil refinery capacity of 2 mb/d. On the condensate side, Iran can achieve a 1 mb/d condensate refinery capacity by 2020. It is expected that by 2017 Iran become self-sufficient in producing its gasoline needs and by 2020 can replace almost all of its condensate export with the light distillates produced in its refineries. This also means that in the medium to long-term, Iran’s oil export share in the market will remain same as its pre-2012. Therefore, it is important to note that Iran’s major energy impact in the medium and long terms will be on the downstream, refined petroleum products, and petrochemical markets.

Madam Chair, Members of the Committee;

If Iran complies with the Joint Comprehensive Plan of Action (JCPOA) as the result of the nuclear deal, its re-integration to the energy market would be under a new policy and with a different approach from its pre-2012 dynamics. This shift would be based on two major components: 1) increasing its self-reliance and 2) maintaining a more active energy diplomacy to create long-term ties with its neighbors and international partners.

It is important to note that since 2012, Iran’s dependency on its oil revenue was substantially reduced. The Energy Information Administration (EIA) estimates that Iran’s net oil export revenue in 2012 was $69 billion, down from $95 billion in 2011.11 Iran’s oil export revenue prior to 2011 was above 80 percent of Iran’s total export earnings and about 60 percent of the government’s revenue. The share of oil export in Iran’s annual budget plunged from above 70% prior to 2012 to about 33% in 2015. This is reflected in its 2015 budget. In 2015, the Iranian government is substituting its lost oil revenue with increased taxes, privatizing some government firms, coupled with savings from its fuel subsidy reduction plan.12 Therefore, increasing its crude oil export share is not in Iran’s medium to long-term energy policy, nor its necessity. Instead Iran will focus on expanding its refined products, petrochemical and natural gas export capacity. So the idea of a sudden glut of Iranian oil on world markets – and the revenue accrued to such – is not entirely accurate.

Another important factor that would affect the global energy industry’s approach toward Iran is its relatively very low production costs. This is highly attractive to international investors, particularly at such current low prices. The cost of producing one barrel of oil from onshore and offshore fields in Iran varies from between $2 to $5 (production maintenance costs increase it to $7-$10).13 Sanctions against Russia since 2014, combined with turmoil in Iraq, have made Iran’s potential for investment comparatively favorable. Saudi Arabia also has very low production costs, but the Kingdom has no plan for increasing its production capacity at the moment.14 Massive untapped natural gas resources with a high rate of return, coupled with land access to major consumers, are other attractive factors for investors and international oil companies.
Having Iran out of isolation would have a significant impact on involving partners inside Iran and also energy trade movements. At the time of sanctions and restricted access to the international resources, Iran has no economic choice but to partner with countries like China and Russia. However there has been a strong signal from Iranian officials that in fact they would prefer to do business with European and American companies. Hence energy and industry involvement of those companies and countries that their policies and interests are in the same line and direction as US policy might be of an advantage.

Energy supplies and trade movements from Iran, particularly when energy supplies in the region, particularly in Iraq and Syria, are threatened by the terrorist groups such as Daesh, is important. It is noteworthy that damage to the energy facilities in the mentioned countries could have long-term impact on their supplies. On the natural gas side; in the next 2-5 years Iran could expand its natural gas export capacity and potentially could export its gas via pipeline and LNG to its neighboring countries or to Asian and European markets. Iran could conceivably become a transit point for energy resources in the North Caspian, transferring oil and natural gas from countries like Azerbaijan or Kazakhstan to the global energy market. Therefore Iran could potentially have an important role in the energy trade movement in the region and to the global oil market, specifically at the time that Middle East's energy supplies are tackling with terrorist threats and overall instability.

I would like to also note that I discussed the details of this testimony and more in a report that I recently wrote for Atlantic Council titled 'Iran’s Energy Policy After the Nuclear Deal'.

Once again thanks for the opportunity you gave to present this important topic before your committee and I am looking forward to the questions.
## Appendix

Table 1: NIOC's Plan to Increase Crude Oil and Condensate By 2017-2018

<table>
<thead>
<tr>
<th>Hydrocarbon Type</th>
<th>By June 2015</th>
<th>End of 2017 - Mid-2018</th>
<th>Major Source of Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil</td>
<td>About 2.9 mb/d</td>
<td>4.7 mb/d</td>
<td>EOR/IOR of mature fields, 700 kb/d new oil from West Karun oilfields</td>
</tr>
<tr>
<td>Condensate</td>
<td>480 kb/d</td>
<td>1 mb/d</td>
<td>South Pars Phases: 12, 15-16, 17-18</td>
</tr>
</tbody>
</table>

Table 2: NIOC's Plan to Increase Natural Gas By 2017-2018

<table>
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<tr>
<th>Hydrocarbon Type</th>
<th>By June 2015</th>
<th>End of 2017 - Mid-2018</th>
<th>Major Source of Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>About 580 mcm/d</td>
<td>1 bcm/d</td>
<td>South Pars Phases: 12, 15-16, 17-18</td>
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Table 3: Additional Condensate Production from South Pars, 2015-2016

<table>
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<tr>
<th>South Pars Phases</th>
<th>Production Capacity (b/d)</th>
<th>Latest Status</th>
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<tr>
<td>Phase 12</td>
<td>120,000 (Current Production rate is about 71,000-80,000 b/d)</td>
<td>Completed and inaugurated in March 2015</td>
</tr>
<tr>
<td>Phases 15 and 16</td>
<td>75,000</td>
<td>Expected to be complete by the end of 2015</td>
</tr>
<tr>
<td>Phases 17 and 18</td>
<td>80,000</td>
<td>Expected to be complete by mid-2016</td>
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Testimony of Sara Vakhshouri, Ph.D. | Senate Energy & Natural Resources Committee December 10, 2015
Endnotes


5 Condensate, or natural gas condensate, is light hydrocarbon liquid with low density that is the byproduct of natural gas from a gas field. It is also called natural gasoline, because it contains hydrocarbons with the boiling range of gasoline.


7 Ibid.


9 “Iran’s Priorities for Developing Its Shared Oil and Gas Fields,” IRNA.


11 EIA, Country Analysis Brief, Iran, June 19 2015, EIA: http://www.eia.gov/beta/international/analysis_includes/countries_long/Iran/iran.pdf

12 Iranian new year starts from March


16 Ibid

17 Ibid

Testimony of Sara Vakhshouri, Ph.D. | Senate Energy & Natural Resources Committee
December 10, 2015
IRAN’S ENERGY POLICY AFTER THE NUCLEAR DEAL

Sara Vakhshouri
IRAN'S ENERGY POLICY AFTER THE NUCLEAR DEAL

Sara Valshouri

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Cover photo credit: Reheb Homavandi/Reuters. Gas flares from an oil production platform at the Soroush oil fields with an Iranian flag in the foreground.

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November 2015
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IRAN'S ENERGY POLICY AFTER THE NUCLEAR DEAL

EXECUTIVE SUMMARY

This report looks at changes to Iran’s energy policy in light of the 2012 acceleration of economic and energy sanctions that the country faced because of its nuclear program, as well as Iran’s July 2015 nuclear deal with the Western powers. To gain a better understanding of the psychology and rationale of the Iranian leaders with regard to their energy policy, this report starts by discussing the history of Iran’s energy industry, including the country’s conflicts with the international community over its energy resources. These historical examples, which are discussed in detail, indicate that after any conflict and relief from international sanctions, Iran took steps toward increasing its domestic capability in order to become more independent.

The next section of the report is dedicated to changes in Iran’s energy policy since 2012, including the impact of the sanctions relief that was part of the July 2015 nuclear deal. It compares Iran’s crude oil and natural gas production and export policy after the 1979 Revolution with those from after the 2012 sanctions and the 2015 nuclear agreement. Iran’s upstream and downstream energy policy, its plans for its petrochemical industry, and its new upstream investment regulation (Iran Petroleum Contract) are discussed in detail. Other emphasized topics include Iran’s energy diplomacy, plans for reintegrating with the global energy market; strengthening its political and economic ties with its Arab neighbors; increasing incentives for international investors to invest in its energy industry; attempts to regain its lost oil market share; controlling its domestic energy consumption; and other specific measures to increase the country’s resistance toward possible sanctions and limitations in the future, based on the doctrine of “Economy of Resistance.” It is important to note regarding their energy policy, the changes in Iran’s energy policy and diplomacy since 2012. Hence, analyzing the viability of each policy is above the scope of this report. Oil is not only the main driver of Iran’s economy and its primary source of income, but also an important diplomatic tool. Nuclear-related sanctions on Iran’s energy industry, particularly since 2012, have created a new approach among Iranian leaders toward the economy, energy industry, and oil diplomacy. This will be particularly true in light of the possible sanctions relief prompted by the nuclear agreement between Iran and the P5+1 (China, France, Germany, Russia, the United Kingdom, and the United States) reached on July 14, 2015.

This new approach is mostly based on Iranian Supreme Leader Ayatollah Ali Khamenei’s doctrine of the “Economy of Resistance,” which seeks to create resistance toward current and possible future sanctions or international pressures on the Iranian economy, particularly on its oil and gas exports. The “Economy of Resistance” seeks to increase the value of non-oil exports and of the value-added chain of production inside the country, lower energy consumption, and boost economic self-reliance. The doctrine also places special emphasis on exporting downstream products (such as refined petroleum products) and petrochemical products. The “Economy of Resistance” also focuses on converting part of Iran’s natural gas into electricity and on exporting that electricity.

One of Iran’s other major policies is to increase investment incentives by modifying its upstream investment regulations for oil and gas, and its terms and conditions for foreign investment. These newly reformed regulations consider flexible ceilings for profit and cost, and also focus on integrating the exploration, development, and production processes. Iranian petroleum officials called the new upstream investment contract the Iran Petroleum Contract (IPC). This model is introduced only for upstream investment contracts and covers exploration, development, and production of the oil and gas fields. Iran reformed its upstream energy contracts because, given the risks of investment in Iran (particularly international sanctions), the existing contracts were not attractive enough to engage and maintain the international investors active in its energy industry. (This is discussed in detail in section 6.1.) According to the IPC economic model, the profit rate per barrel increases in correlation with the risk of investment in each project. Although the details of the IPC have not yet been officially introduced by the Ministry of Petroleum, the contract will most likely extend the duration of investment from seven years to twenty years by involving foreign investors in the production process. Iran hopes to increase the quality of its work and protect its hydrocarbon reservoirs by involving investors for longer periods of time, and by giving them a more vested stake in the field. This factor could have a political advantage for the Iranian side, as international partners would have shared profits and interests in Iran for longer periods of time. Involving international oil companies (IOCs) in the production process will also help Iran to better market and sell its oilfield products, thereby increasing its market share.

Allocating its foreign currency reserves to investment in the energy sector, and to international companies, allows Iran to utilize part of its oil revenue that has been in international escrow accounts outside of Iran since 2012. The top priorities of Iran’s petroleum ministry and the

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1 This means that, instead of exporting raw materials such as crude oil or natural gas, Iran would process them domestically and export the final product. For instance, Iran could sell its crude oil or condensate domestically and export the refined petroleum products. It could also convert its natural gas to electricity or petrochemical products, and export these instead of natural gas.
2 In other words, as the risk of investment increases for each field, the investor’s reward or profit for each barrel it produces will increase. In an interview with Behdad Rezaeezadeh, Al-Monitor, February 25, 2019, http://www.shana.ir/en/newsagency/219465/iran-offers-new-terms-for-oil-contracts.
4 Ibid.
5 Ibid.
National Iranian Oil Company (NIOC) include: increasing Iran's oil and natural gas production; regaining its lost market share of more than one million barrels per day and its position as the second-leading exporter in the Organization of the Petroleum Exporting Countries (OPEC); and increasing its share of exports in the global natural gas market. Beyond that, exchanging oil for goods or services, along with other incentives such as discounting oil, would be an important strategy for Iran to try to regain its lost market share.

Iran has twelve shared oil and gas fields with its neighbors. Tehran has adopted a new approach toward its neighbors with regard to its energy diplomacy. One of Iran's priorities is to increase the export of crude oil, refined petroleum products, natural gas, and electricity to Turkey, Iraq, and other Gulf Cooperation Council (GCC) neighbors. It aims to use these countries as transit points to send Iranian natural gas to international markets—the European Union (EU) in particular—and vice versa (e.g., exporting natural gas to Oman and using its liquefied natural gas (LNG) facilities to re-export gas; pursuing oil-swap plans with its neighbors north of the Caspian Sea such as Azerbaijan). Both before and after 1979, Iran's policy for securing market share was to build or purchase a share of refineries outside of Iran, but the country never obtained a significant share of any refinery outside of its borders. Recently, however, Iran has been actively attempting to build refineries in countries like Iraq; the chairman of NIOC announced in August that his company had opened an office in Iraq. Iran is also actively seeking to increase economic and energy ties with its neighbors through industrial exports and engineering services.

7. Ibid. Iranian oil officials announced that they have exported $450 million of engineering services to Turkmenistan, and this number is planned to increase to $1 billion by the end of March 2015.
IRAN'S ENERGY POLICY AFTER THE NUCLEAR DEAL

1. BACKGROUND

The history of Iran's hydrocarbon industry is one of ups and downs. It has engendered a palpable sense among Iranian leaders of the need for self-reliance and increased "resistance" of the Iranian economy against international pressures. As a result, Iranian energy policy has become predicated upon survival and preparing for the worst.

Iran's oil discovery dates back to 1901, when Iranian King Mozaffar a-Din Shah of the Qajar dynasty gave the British William Knox D'Arcy a sixty-year concession with the exclusive right to explore, process, and export oil and petroleum products. The agreement stipulated that the Iranian government would receive only 16 percent of the net profit from all oil and petroleum-related operations. In 1908, D'Arcy and his team drilled the first oil well in the southwestern city of Masjidi Soleiman. And in 1909, the Anglo-Persian Oil Company (APOC), now known as BP, was established in London to control D'Arcy's rights and operations in Iran. The British government became APOC's major shareholder in 1914, with a 51 percent share of the company.

The long-lasting conflicts over rights and profit sharing between Iran and APOC, which changed its name to the Anglo-Iranian Oil Company (AIOC), escalated in the 1940s. In March 1951, the Iranian Parliament, under the leadership of Prime Minister Mohammad Mossadegh, nationalized the Iranian oil industry. The British government immediately instituted an international ban (read sanctions) on the purchase of Iranian oil, causing the Anglo-Iranian Oil Company (AIOC), later renamed the Anglo-Persian Oil Company (APOC), to withdraw its engineers from the Iranian oilfields. In spite of this, the Iranian government was able to continue production. It was finally able to break the international embargo in 1953, by selling its first cargo of oil (with a 30 percent discount on global prices) to both the Italian government and the Japanese company Idemitsu Kosan.

Then, in September 1954, an eight-member consortium called the Iranian Oil Participants (IOP) formed, with the following composition: British Petroleum Company (BP) held 40 percent, Shell 14 percent, Chevrons 8 percent, Exxon 8 percent, Gulf 8 percent, Mobil 8 percent, Texaco 8 percent, and Compagnie Francaise des Petroles 6 percent. The National Iranian Oil Company (NIOC) was the owner of Iran's oil deposits and the Iranian oil industry's installed assets. However, actual control over the industry was firmly in the hands of the consortium members. NIOC, therefore, had no influence or control over the production, refining, and export of Iranian crude oil and products.

As a result of this lack of control, in addition to lessons learned from the oil embargo, the Iranians began to increase their self-reliance. The Iranian government realized that one of its main weaknesses was the inability to transport its own oil to global markets. In 1955, Iran established the National Iranian Tanker Company (NITC), which today is one of the largest oil-transporting companies in the world, owning at least forty-two very large crude carriers (VLCC). NITC had a major role in transporting Iranian oil to international markets during the eight years of war with Iraq (1980-1988) and also after EU and US sanctions on Iranian oil exports, transportation, and insurance in 2012.

The 1979 Islamic Revolution, and the subsequent eight years of the Iran-Iraq War, spent Iran's energy policy once again. After 1979, the consortium was dissolved, and NIOC took control of Iran's energy industry and the export of crude oil and refined petroleum products. Iran also announced that it would not export its crude oil and products to Iraq—ending a once-robust relationship—and that Islamic countries would be preferred customers. US-Iranian relations hit a low point in the early days of the Iranian revolution, and were further damaged by the hostage crisis of 1979-81. Diplomatic relations between the two countries were broken off, and have not been reestablished. As a result, the United States stopped purchasing and importing Iranian oil, causing Iran's broader oil trade and flow to shift toward Asian markets. The United States has also implemented unilateral sanctions on Iran since 1996, when President Bill Clinton prohibited US investment in Iran's energy sector. Successive US administrations tightened sanctions and limitations against Iran on the basis that Iran was pursuing nuclear weapons, as well as Tehran's support for groups such as Hamas, Islamic Jihad, and Hezbollah.

In 1996, the United States passed the Iran-Libya Sanctions Act, later renamed the Iran Sanctions Act (ISA), which imposed sanctions on firms making financial and technological investments in Iran's energy industry. However, ISA did not prevent non-US firms from investing there. By 2012, the EU implemented its own sanctions, which complemented US sanctions by also banning imports of oil, investments in the hydrocarbon industries, and technology transfers.

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9 Oil production was from 51 million barrels per year in 1933 to 232 million barrels per year in 1958. During this time, most of the oil was sold to Great Britain for domestic use and to ships during World War II. See Sara Vahideh, Marketing and Sale of Iranian Crude Oil after the Islamic Revolution (Tehran: Sohohqilan Publishing House, 2011).
10 The National Iranian Oil Company (NIOC) is a government-owned company under the direction of Iran's Ministry of Petroleum. NIOC was established in 1948 and is responsible for oil and natural gas development, production, and export.
11 In 1957, the Elgin-Ashkelon Pipeline was built in Israel to transport Iranian crude oil to Europe. In 1968, the Elgin Ashkelon Pipeline Company (EAPC) was founded as a joint venture, with a 50-50 share between Iran and Israel, to transport oil from Iran to Israel. Between the Arab-Israeli embargo of 1973 and the revolution of 1979, Iran supplied most of Israel's oil.

ATLANTIC COUNCIL
other financial transactions. This hindered Iran's financial dealings with the international community.

Total of France, which was the first major international oil company that refused to consider the American sanctions as legally binding, invested in and developed the Sir A and Sir B oilfields. Iran could attract $15 billion of investment under sanctions, even though this was far less than what was required to rehabilitate its energy production. As a result of two decades of war and sanctions, Iran's oil production had dropped from its peak of 6 million barrels per day (mb/d) in late 1970 to about 4.2 mb/d in early 2000.

The 2000s saw further decreases in Iranian hydrocarbon production and exports, as the West sought to limit Tehran's nuclear program. However, the real changes came in 2012, because of the additional sanctions implemented by both the United States and the EU, which caused Iran's production to drop below 3 mb/d.

As a result of these turbulent decades and additional international sanctions, Iran's strategic energy policy is largely based on two pillars: building an "Economy of Resistance" and creating strategic alliances. First, Khamenei's "Economy of Resistance" doctrine, announced in February 2014, suggests that Iran should increase self-reliance by focusing on developing or adding value to the production chain inside the country, instead of exporting raw material, and also by reducing its dependence on oil-export revenue. Second, Iran seeks to create long-term energy ties and alliances with international oil companies and neighboring countries to raise their interest and stakes in Iran.

This historical context lays the framework for understanding Iran's current energy policies, which were adopted as a response to the 2012 sanctions against its energy industry and exports, and in anticipation of the possible removal of sanctions following the nuclear deal between Tehran and the P5+1. The following sections are dedicated to discussing Iran's policy toward domestic oil and gas production, exports, the downstream and refinery sectors, the petrochemical industry, and new investment regulations.

2. CRUDE OIL AND NATURAL GAS PRODUCTION POLICY

Iran holds the fourth-largest proven oil reserves after Saudi Arabia, Venezuela, and Canada. The country also possesses the second-largest natural gas reserves after Russia. In 2015, estimates indicated that Iran had the largest natural...
IRAN'S ENERGY POLICY AFTER THE NUCLEAR DEAL

Gas reserves in the world. In 2013, Iran produced 3.2 mb/d of oil and 5.6 trillion cubic feet (Tcf) of natural gas. Iran is among the top-five global oil and gas producers in the market. However, because of sanctions, Iran's share of oil exports in the global market has plummeted since 2012. Also, despite having substantial natural gas reserves, Iran has never obtained even 1 percent of the global gas market. Iranian Minister of Petroleum Bijan Zangeneh said Iran's crude oil policy is to regain its pre-2012 production level of 4 mb/d of crude oil and its last OPEC share of 2.5 mb/d of crude oil export. NIOC seeks to achieve this by implementing reinjection techniques utilizing water or natural gas, and by developing new fields. NIOC also sees developing natural gas fields and expanding production capacity as its highest priority. South Pars, the giant non-associate gas field shared by Iran and Qatar, is the top priority. The advantages of increasing natural gas capacity are many. Iran can utilize natural gas production for domestic electricity generation, thereby releasing its oil liquid capacity for export; feedstock of its petrochemical factories, where natural gas is in higher demand than crude oil; export via land or LNG for neighbors and other international buyers; or electricity export to neighboring countries.

As a byproduct of natural gas, condensate creates other significant advantages for Iran. Indeed, condensate is of higher quality than Iran's heavy and sour crude oil, is priced higher than its crude oil, and enjoys far less intense competition in the market than does crude oil. Iran could also refine its condensate in house, and produce light distillates like gasoline for domestic use or export. The Asmari formation has the highest amount of oil production, and the Bangestan (Sarvak) formation holds a considerable volume of recoverable oil. Iran suffers from the long-term negative effects of international sanctions that have prevented investment and technologies from entering the Iranian energy market. Prior to the 2012 sanctions, Iran's oil production was about 4 mb/d. The latest status of Iranian oil and gas fields indicate that Iran's current crude oil production is about 2.9 mb/d, and natural gas liquids (NGL) and condensate production has stayed level at about 692,000-710,000 b/d. Out of this 2.9 mb/d, Iran consumed about 1.5-1.7 mb/d domestically and exported about 1-1.2 mb/d. (See 2.4.1 for Crude Oil and Condensate Exports.)

About 75 percent of Iran's non-crude-oil liquid is condensate and the byproduct of non-associated gas in the South Pars gas field, and the rest is liquid that comes from Kangan, Nae, and other fields. Iran's current condensate production is about 480,000 b/d, and is expected to rise to 630,000 by mid-2016. Most Iranian oilfields are old and mature, which means they require further investment, and treatments like gas reinjection, in order to maintain current production levels. "The country's oil wells are mostly in the second half of their lives, and are facing continued natural depletion of production capacity at the rate of 6-11 percent per year." It is estimated that Iranian oilfields lose between 300-500,000 b/d of natural reduction every year due to the maturity of the fields.

As sanctions roll back, Iran's supply will gradually rebound. Iran's oil minister announced that he will increase oil production by 500,000 b/d after the sanctions are lifted, and will add an extra 500,000 b/d six months after that. In the most conservative view, if sanctions are lifted by mid-2016, Iran could possibly add 500,000-700,000 b/d of crude oil and liquids to its production by mid-to-late 2016. NIOC can add 150,000-200,000 b/d of condensates to its liquid production by mid-2016. This additional condensate will be from phases 12, 15-16, and 17-18.

18 Ibid.
19 Condensate, or natural gas condensate, is light hydrocarbon liquid with low density that is the byproduct of natural gas from a gas field. It is also called natural gasoline, because it contains hydrocarbons with the boiling range of gasoline.
20 "Recoverable" or "proven" reserves are the amount of natural resources that is extractable using current technological capabilities. "Initial" or "in place" resources indicate all of the explored hydrocarbons in the reservoir.
22 US Energy Information Administration, "Country Analysis Brief, Iran," 23 Ibid.
26 Ibid.
27 Ibid.
28 US Energy Information Administration, "Country Analysis Brief, Iran."
29 Ibid.
31 South Pars is a giant gas field that was discovered in 1990 and is located in the Persian Gulf. Pars Oil and Gas Company is in charge of development of this field, and defined twenty-four developmental phases for this field. Each field is expected to produce both natural gas and condensate. Currently, the phases 1-10 and 12 are completed. Phases 11-15 are also partially completed, and are expected to finish by mid-2016.

23 Ibid.
24 Ibid.
25 Ibid.
26 Ibid.
27 Ibid.
of South Pars gas field. Immediately after the removal of sanctions, Iran will also start sales negotiations for exporting the 37-45 million barrels of additional stored liquid on its floating storages. More than half of Iran’s floating storages are estimated to be filled by condensate; the other half are crude oil, fuel oil, and a blend of crude oil and condensate.

Over the next few years, NIOC will work to increase its crude oil production capacity by:

- preventing any further production drop and restoring the lost production capacity from mature fields, particularly in the southern oilfields, by enhanced oil recovery (EOR) and international oil companies (IOC) operation; and
- producing new resources of crude oil from heavy oilfields located west of the Karun River, known as “West Karun” oilfields (North and South Azadegan, Yadavaran, Jaferei, Sohrab, Susangerd, and Yaran).

NIOC announced that its oil production capacity would reach 5.7 mb/d by 2017-2018, of which 1 mb/d would be condensate. Most of this condensate would be produced from the South Pars giant gas field. As a result of easing sanctions, enhanced oil recovery and improved oil recovery (EOR/IOR) projects from mature oilfields, as well as new development projects in the West Karun oilfields, could add an additional 650,000-700,000 b/d of crude oil production. This could also increase condensate production in South Pars to 1 mb/d by 2017-2018.

2.2. NATURAL GAS PRODUCTION POLICY

Iran has the world’s largest proven natural gas reserves, and the country is the home of 17-18 percent of the world’s natural gas reserves. Iran’s original gas in place is estimated to be 1,201 Tcf (about 34 trillion cubic meters).

Iran is now the third-largest global producer of natural gas behind Russia and the United States. Additionally, the

34 Ibid.
38 Ibid.
39 Ibid.
Table 1: NIOC’s Plan to Increase Crude Oil and Condensate By 2017-2018

<table>
<thead>
<tr>
<th>Hydrocarbon Type</th>
<th>By June 2015</th>
<th>End of 2017-Mid-2018</th>
<th>Major Source of Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil</td>
<td>2.9 mb/d</td>
<td>4.7 mb/d</td>
<td>EOR/IOR of mature fields</td>
</tr>
<tr>
<td>Condensate</td>
<td>480 kb/d</td>
<td>1 mb/d</td>
<td>South Pars</td>
</tr>
</tbody>
</table>


Table 2. Additional Condensate Production from South Pars, 2015-2016

<table>
<thead>
<tr>
<th>South Pars Phases</th>
<th>Production Capacity (b/d)</th>
<th>Latest Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 12</td>
<td>120,000 (Current Production is about 70,000-80,000 b/d)</td>
<td>Completed and inaugurated in March 2015</td>
</tr>
<tr>
<td>Phases 15 and 16</td>
<td>75,000</td>
<td>Expected to be complete by the end of 2015</td>
</tr>
<tr>
<td>Phases 17 and 18</td>
<td>80,000</td>
<td>Expected to be complete by mid-2016</td>
</tr>
</tbody>
</table>

Source: SVB Energy International, "Iran Upstream Oil and Gas Report."

Table 3: NIOC’s Plan to Increase Natural Gas By 2017-2018

<table>
<thead>
<tr>
<th>Hydrocarbon Type</th>
<th>By June 2015</th>
<th>End of 2017-Mid-2018</th>
<th>Major Source of Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>580 mcm/d</td>
<td>1 bcm/d</td>
<td>South Pars Phases: 12, 15-16, 17-18</td>
</tr>
</tbody>
</table>


NIOC plans to increase its natural gas production from about 600 mcm/d in 2015 to 1 bcm/d by the end of 2017.


43 Most of this will be produced from twenty-seven out of the twenty-eight phases of the South Pars giant gas field, with the exception of phase 11, which is still undeveloped. Phases 12, 15-16, and 17-18 of South Pars are expected to be completed between mid-2015 and late 2016. Completion of these phases will add more than 100 mcm/d to Iran’s natural gas production. According to NIOC, South Pars is currently producing 54 percent of Iran's natural gas production.


Iran's natural gas production, at an average daily rate of 365 bcm.

However, Iran also faces substantial growth in annual domestic gas consumption, which prevents it from achieving significant export capacity. In 2013, 60 percent of Iran's total energy consumption came from natural gas, and only 38 percent was from oil (meaning 98 percent of Iran's consumption was from oil or gas). The remainder, less than 2 percent, included hydropower, nuclear, and non-hydro renewables. In 2014, Iran consumed nearly 7 percent more gas than it did in 2013. Yet, according to National Iranian Gas Company (NIGC), Iran's natural gas consumption is growing at an average rate of 3.1 percent per year, making it the third-largest consumer of natural gas after the United States and Russia. It is noteworthy that in 2013, 67 percent of Iran's electricity was produced from natural gas, and that the share of natural gas in Iran's transportation system is 14 percent.

2.3. INVESTMENT REQUIREMENTS TO REACH THE MID-TERM OIL AND GAS PRODUCTION GOALS

Iran’s Ministry of Petroleum, Bijan Namjoo, recently announced an urgent demand for approximately $30 billion to pursue South Pars development plans, and at least $20 billion to complete the ongoing development projects in the West Karun reservoirs within three years. Iran’s National Development Fund (NDF) approved a $20 billion allocation for investment in West Karun, and the remaining funds would need to come from foreign investment.

According to the fifth five-year economic plan for the period from March 2011 to March 2016, Iran aimed to increase oil production to 5.152 mb/d by attracting $155 billion is needed to address Iran's whole oil and gas industry, including upstream exploration and production, downstream, petrochemicals, midstream, and shipping. But international sanctions will need to be removed before the industry can attract enough financial investment to help this plan come to fruition.

3. OIL AND GAS EXPORT POLICY

The historical context of Iran's crude oil export policy has been discussed earlier. As mentioned, after the Islamic Revolution, the consortium of international oil companies that were in charge of marketing and sales of Iranian oil was dissolved, and NIOC took over the entire export process. After the 2012 sanctions that targeted Iranian oil sales, the country's oil production and export dropped by more than 1 mb/d. Given the low oil prices of the current environment, Iran could face hurdles in terms of marketing and selling its oil. This section discusses different strategies that NIOC would adopt to regain its lost market share and sell additional quantities, after the removal of sanctions.

3.1. CRUDE OIL EXPORT POLICY

Prior to the 2012 sanctions, Iran exported around 2.5 mb/d and was the second-largest oil exporter in OPEC. However, due to sanctions, the average export of crude oil declined around 40 percent to about 1.5 mb/d in 2012, and to 1 mb/d in 2014. By 2014, Iran had fallen to the seventh-largest exporter in OPEC after Saudi Arabia, Iraq, the United Arab Emirates (UAE), Nigeria, Kuwait, and Angola. In order to increase crude oil production to pre-2012 levels, Iran will have to tackle significant technical challenges, as well as daunting marketing and sales hurdles such as lost market share, oversupply in the market, and low oil prices.

Market Share. As sanctions are lifted, Iran will try to regain its lost market share of more than 1 mb/d, which is particularly acute at a time of oversupply and low oil prices. Most of Iran's crude oil competitors, primarily Saudi Arabia and Kuwait, have already signed long-term agreements with their customers. These commitments are usually for at least one year. As Saudi Arabia has given no indication that it will cut production, Tehran will have no choice but to sell most of its excess oil supplies on the spot market for the next year. Selling oil on the spot market is not usually a desirable option for major oil suppliers, particularly at the time of oversupply and tight competition.
in the market. It is expected that Iran will regain part of its lost market share of 600,000-700,000 b/d in Europe after the removal of sanctions on its oil exports.

In order to regain market share, Iran will have to create incentives for signing long-term contracts. Iran will try to regain its lost market share of about 700,000 b/d in Europe, and will also increase its exports to the Asia-Pacific region: China, India, and Japan. Part of this oil will be arranged as oil for goods and services with companies from countries that provide investment and procurement to the Iranian energy sector and other industries. (See below for more details.) Iran could also conduct a crude oil swap with its northern neighbors—importing oil from Azerbaijan, refining it in its northern refineries, and delivering the same amount of oil from its southern fields to Azerbaijan’s customers in the Persian Gulf. However, since Iran lacks a huge storage capacity for its unsold oil, it can only increase its crude oil production slowly and cautiously. With such low prices, it is counterproductive for Iran to rent tankers as floating storage and sell its oil at further discounts. Having excess oil stored at sea will also encourage Iran’s customers to push for further discounts. Another hurdle for Iran is the lack of enough vessels and tankers in the market for transporting extra oil. Iran’s own tanker fleet would not be sufficient for transporting the extra daily production, particularly given that some of the tankers are usually occupied as floating storage. The National Iranian Tanker Company (NITC) has forty-two Very Large Crude Carrier (VLCC), each of which has a capacity of 2 mb/d.58

Condensate vs. Crude Oil. Some of Iran’s production boost, about 200,000 b/d, will be condensate, which is a lighter liquid than crude oil and sells in a different market. Despite the fact that Iran’s condensate has high levels of sulfur, it is still considered a light crude oil, and is traded at higher prices than is heavy oil. Iran also has few rivals in the condensate market, competing mainly with the United States and Russia.59 Additionally, condensate is in high demand, particularly in Asia.60

Discounts. Offering discounts or lower price premiums for comparable quality crude oil is one of the easiest ways of creating incentives for customers. The production cost in Iran is $3-7 per barrel,61 so even with a market price range of $40-50, Iran still has space for offering discounts and increasing its market share.

56l/2012/08/24/asia-condensate-asia-idUSL4E8j81HT20120824.
60 Asia’s condensate demand is expected to double by 2016, as new splitters are going to be built to process this very light liquid. South Korea, China, and Singapore are building distillation units to split the condensate with one-seventh the cost of a normal refinery unit. On the other hand, the condensate suppliers of Qatar, the biggest supplier to this region, are expected to drop as the country’s domestic use of condensate is increasing. See “Asia Condensate Demand to Double by 2016, Opening Market to New Suppliers,” Reuters.
It is unclear, however, whether Iran would pursue this course of action. Even under sanctions, when prices were above $100 per barrel, there was no evidence that Iran substantially discounted its oil. Instead, it offered official discounts of $2-$5 per barrel, never more than $7.62 NIOC understands that discounting is a slippery slope. If it begins offering substantial discounts, its customers will demand increasingly lower prices, especially if the country is seen as weakened from sanctions and international pressure.63 In addition, discounts are even less effective during a time of low oil prices, as other suppliers could easily match the discounted price, given their own low production costs.

Oil for Goods and Services. An exchange or barter of oil for goods and services could be an effective way for Iran to increase its market share. For instance, Iran could take loans from Chinese banks to import industrial goods, and then repay its debts to China with crude oil.64 Iran could also use oil to repay any services rendered. NIOC has had significant experience with this type of exchange due to Iran’s eight-year war with Iraq, and when it could not access its oil revenue due to sanctions. One of the benefits of exchanging oil for goods and services is that it would not only create incentives for companies to purchase Iranian oil, but would also help Iran import what it needs without resorting to hard currency.

In January 2014, at the height of sanctions, Iran signed a $20 billion oil-for-goods deal with Russia, exchanging 500,000 b/d of Iranian oil for Russian goods and services.65 Russia could redirect this crude oil to Belarus and Kazakhstan and, in return, export its military and industrial equipment to Iran.66 Iran could also use oil to repay any services rendered. NIOC has had significant experience with this type of exchange due to Iran’s eight-year war with Iraq, and when it could not access its oil revenue due to sanctions. One of the benefits of exchanging oil for goods and services is that it would not only create incentives for companies to purchase Iranian oil, but would also help Iran import what it needs without resorting to hard currency.

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3.2. NATURAL GAS EXPORT POLICY

Part of Iran’s 2025 National Vision Document and the “Economy of Resistance” includes increasing natural gas production and expanding the natural gas market from 1.5 percent to 10 percent by the end of 2025.67 This is also the target date for reaching Iran’s goals for exporting natural gas or converting it to electricity and then exporting it. If sanctions are lifted and Iran succeeds in attracting the required foreign investment and technology to develop its natural gas fields, this target would be a realistic goal.

As mentioned earlier, sanctions on foreign investment and technology along with high levels of domestic consumption, have kept Iran’s share of the global gas export market relatively low, despite Iran’s success in increasing natural gas production and exportation during the past few years.

Overall, Iran produced 159.9 bcm of natural gas in 2011, while it consumed 162.4 bcm, which means that Iran had little to no export capacity.68 Iran’s natural gas trade balance became positive for the first time in 2014 (see below) when its production of natural gas increased to 172.6 bcm and its consumption of natural gas rose to 170.2 bcm.69

According to Zangeneh, Iran is planning to increase natural gas production to 1,000 million cubic meters a day (mcm/d) by 2015, and to increase natural gas exports to 80 mcm per year by 2020.70 Iran consumes almost all of its gas production domestically; 65 percent of Iranian primary energy consumption is supplied by its own natural gas. Iranian households “account for 48 percent of annual gas consumption, power plants for 27 percent, and major industries for about 16 percent.”71 Iran utilizes gas injection to maintain pressure in its oil wells. It injected about 100 million cubic meters a day (cm/d) of gas into its oilfields last year, and is planning to raise the volume to 270 million cm/d by 2015.72

The international sanctions did not target Iran’s natural gas exports, so the country was able to increase its natural gas production since the 2012 sanctions. In 2014, Iran’s natural gas production increased and, as noted above, its natural gas trade balance was positive for the first time.73 Iran exported 9.6 bcm, and its natural gas imports were only 6.3 bcm.74

Turkey accounts for 90 percent of Iran’s exports. In 1996, Iran and Turkey signed a contract for the sale of 10 billion cubic meters per year (bcm/y) of natural gas from Iran to Turkey for twenty-five years. In 2009, Iran exported only 5.25 billion cubic meters (bcm) of gas to Turkey. But in 2010, this rose to 7.77 bcm, and in 2011 to 8.4 bcm.

62 Ibid.
63 Ibid.
67 Ibid.
69 “Russia Set to Start Iran Crude Imports Under Oil-for-Goods Deal,” Bloomberg.
70 Ibid.
73 Ibid.
74 Ibid.
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Table 4: Iran's Export Destinations and Volume, 2010-2014 (1,000 b/d)

<table>
<thead>
<tr>
<th>Region</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>764</td>
<td>780</td>
<td>162</td>
<td>128</td>
<td>117</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>1,367</td>
<td>1,630</td>
<td>1,839</td>
<td>1,085</td>
<td>992</td>
</tr>
<tr>
<td>Africa</td>
<td>117</td>
<td>127</td>
<td>121</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>


Ultimately hitting 8.9 in 2014 (out of a total export of 9.6 bcm). Iran also exports less than 1 bcm/y of natural gas to Azerbaijan, and barring gas with Armenia in exchange for electricity. Azerbaijan supplies gas to Iran's northern provinces, in return for Iran sending equal amounts of gas to the Azeri exclave Nakhjavan.

On the other hand, Iran imports substantial volumes of natural gas from Turkmenistan. In 2011, it imported 10.2 bcm. However, as previously mentioned, Iran's natural gas trade balance became positive in 2014, and its production will increase even further by mid-2016 to 2017 upon completion of phases 12, 15-16, and 17-18.

A significant advantage Iran has is its land connections with its neighbors. Despite fruitless efforts to build LNG plants, because sanctions prevented Iran from obtaining the mostly American LNG technology, Iran's geographical location offers the opportunity to easily export gas via pipelines, to China via Pakistan and India, to Syria and Lebanon via Iraq, and to Europe via Turkey.

Europe. On the consumer side, EU economies have been searching for secure and more diversified energy sources. Iran could send its gas to Europe through the Turkey corridor, and conceivably play a role in exporting gas through the Trans-Anatolian Natural Gas Pipeline (TANAP). Iran's geographical location could also allow it to be a conduit for transporting energy resources from the Caspian Sea and Central Asia energy producers into Europe, via routes such as TANAP and the Trans-Adriatic Pipeline (TAP). Both Tehran and Baku have shown an interest in Iran sending gas to Azerbaijan and participating in projects like TAP and TANAP. It should be noted that there are many political and geopolitical complexities involved in Iran sending its gas to Europe via these mentioned routes. However, this is only discussed as an option, and analysis of its viability is above the scope of this report.

Gulf Cooperation Council Neighbors. One aspect of Iran's energy diplomacy is to export natural gas and electricity to its Gulf Cooperation Council neighbors in order to increase its market share and create long-term economic—and perhaps political—alliances with its Arab neighbors. One of the priorities of Iranian President Hassan Rouhani's foreign policy is to focus on building and strengthening positive relations with Iran's Arab neighbors. Iranian energy officials also recently announced that they are engaging in serious talks about exporting natural gas, and possibly electricity, to Iran's Arab neighbors. Many of the GCC member countries are major producers of oil and are highly dependent on it for revenue. However, their oil consumption is increasing. Having another source of supply, like Iranian gas, could free up some of their export capacity and allow them to export more oil to help their economies. Oman, UAE, and Kuwait are among the first Arab countries to engage in gas-deal negotiations with Tehran. Iran could also look to redirect its natural gas onto the global market with the help of LNG facilities in Oman. Iran could make the same arrangement with UAE, particularly with regard to its Salaman gas field, which is a shared field between the two countries.

Theoretically, there is also significant potential for energy cooperation between Iran and Saudi Arabia. However, any long-term gas-export commitment must be built on trust.


67 Ibid.

68 BP Statistical Review of World Energy June 2012.

69 “Post-Iran Deal, Azerbaijan Eyes Energy Transit Opportunities,” Eurasianet, June 12, 2015, http://www.eurasianet.org/node/74205. The Trans-Anatolian Natural Gas Pipeline (TANAP) is a natural gas pipeline from Azerbaijan to Europe through Georgia and Turkey. TANAP, South Caspian Pipeline (SCP), and Trans Adriatic Pipeline are all designed to connect the Shah Deniz giant gas field in Azerbaijan to Europe.

70 The Trans-Adriatic Pipeline (TAP) is a pipeline that connects Azerbaijan’s natural gas to Europe. TAP connects Azerbaijan’s natural gas to Italy and Western Europe via Albania and the Adriatic Sea.

71 “Post-Iran Deal, Azerbaijan Eyes Energy Transit Opportunities,” Eurasianet.

Table 5: Iran’s Plans for Natural Gas Export by Destination

<table>
<thead>
<tr>
<th>Country</th>
<th>Plans and Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey</td>
<td>Exporting 85 percent of Iran’s natural gas to Turkey in 2014.</td>
</tr>
<tr>
<td>Iraq</td>
<td>2013, an agreement to export Iranian natural gas from South Pars to Iraq (two routes to Basra and Baghdad). Total export to Iraq is planned to reach 70 mcm/d, and NIGC is planning to increase it to 90 mcm/d. First phase: Through Baghdad route (to Al-Mansour power plant) with total capacity of 40 mcm/d. It is planned to start with 7 mcm/d and have a gradual increase. Second phase: through Basra route (to Basra power plant) with total capacity of 55 mcm/d. The first phase was planned to start exporting 9 mcm/d in March 2015. However, the export hasn’t started due to political and security reasons.</td>
</tr>
<tr>
<td>Gulf Cooperation Council</td>
<td>No export of Iranian natural gas to the GCC. The Saudi–Iran agreement signed in 2016 for export of 10 bcm/y for 25 years, reducing infrastructure and pricing agreement. No deal has been finalized as of 2015.</td>
</tr>
<tr>
<td>Europe</td>
<td>Exporting natural gas to Europe is part of Iran’s natural gas export policy in the past decade. However, no contract for gas exporting to this region, either through pipeline or LNG, is signed. Iran’s oil minister announced that Iran has the potential of exporting 25-30 bcm/y.</td>
</tr>
<tr>
<td>Pakistan</td>
<td>No plans for export of Iranian natural gas to Pakistan. The contract was signed in 2010, but the export was expected to start in 2014. However, Pakistan has not built the required pipeline to connect to the Iranian gas.</td>
</tr>
</tbody>
</table>

production to 90 bcm/d.84 According to this agreement, the first phase transports a total capacity of 40 bcm/d of gas to Al-Manour power plant in Baghdad.85 The gas export is planned to start at 7 bcm/d and gradually increase from there. NCIG announced that it had finalized the construction of 97 kilometers (km) of a 48-inch pipeline with primary capacity of 5 bcm/d. This pipeline would transfer gas to the power plant in Baghdad. Iran would need to construct a total 227 km of pipeline in its own land to transfer the gas to the Baghdad and Al-Manour power plants.86 However, Iranian officials announced that the export had not started, due to political and security reasons.87 The second phase would see a total capacity of 35 bcm/d of gas transported to Basra.88

Electricity vs. Natural Gas. One possible use for Iranian natural gas would be to convert it into electricity and export it. This is beneficial because it would seemingly resemble an “Economy of Resistance” by increasing the value added to natural gas instead of just exporting it in its original form. It would also create stronger trade ties and alliances with Iran’s consumers and neighbors, and it would be harder to convince these countries to stop purchasing electricity from Iran in the event of a “snap back” of sanctions. It would also diversify Iran’s options for utilizing its natural gas, at a time the market is facing oversupply and low energy prices.

Iran plans to allocate 6 bcm of its natural gas for conversion to electricity by 2020. This amount will yield an additional 5,000 megawatts of electricity per year, solely for export.89 Iran currently has the capacity to produce 74,000 megawatts of electricity per year.90

4. IRAN’S POLICY TOWARD ITS DOWNSTREAM AND REFINERY SECTOR

Increasing the refinery capacity of crude oil, natural gas, and condensate is part of Iran’s policy to expand its production chain and increase the value added by preventing the export of raw materials. According to the official website of Iran’s Supreme Leader Sayyed Ali Khamenei, article thirteen of “The General Policies of the Economy of Resistance” suggests that, in order to reduce Iran’s vulnerability and dependence on its crude oil exports, Iran needs to increase exports of natural gas, electricity, petrochemical products, and refined petroleum products.91

After Saudi Arabia, Iran is the second-largest consumer of refined products in the Middle East, with average domestic oil consumption of 1.8 mb/d in 2014.92 This number was 3 percent higher than Iran’s domestic oil consumption in 2012. Gasoline, diesel, and fuel oil have the highest share in Iran’s domestic consumed-fuel basket. International sanctions that have limited Iran’s access to the importation of refined petroleum products, particularly gasoline, have minimized Iran’s ability to export crude oil, and have forced Iran to expand its refinery capacity. Its refinery capacity increased from 1.5 mb/d to around 1.86 mb/d in 2011, 1.98 mb/d in 2013, and 2.03 mb/d in 2014.93 Most of the refining-capacity expansion came from completion of two refineries at Lavan and Arak, complemented by capacity expansion at the Bandar Abbas refinery (see table 6).

In 2013, Iranian refineries produced most of Iran’s demand for refined petroleum products. In that same year, Iran imported only 17,000 b/d of refined products, mostly gasoline with 85 percent of import share.94 It is expected that Iran’s refinery capacity, and particularly gasoline production, will increase further by the end of the Iranian year (ending in March 2016), mainly from capacity expansion in two refineries of Jafan and Bandar Abbas.95 Iran is planning to increase its oil refinery capacity even further. By 2017, it is expected to export gasoline upon the completion of its Persian Gulf Star refinery in Bushahr province, in the southern part of Iran. The mentioned refinery has two phases (or units), and each phase has a capacity of refining 120,000 barrels of condensate per day (total amount of 360,000 b/d). Iran’s gasoline production capacity will reach 96 million liters per day when the Persian Gulf Star refinery starts to produce at its maximum capacity in 2017.

Iran wants to increase its oil refinery capacity to 2 mb/d, and to expand its condensate refinery capacity to 1 mb/d by 2020, thereby reaching a total refinery capacity of 3 mb/d. Iran is on track to meet this goal; by the end of 2014, Iran reached its nominal oil refinery capacity of 2 mb/d.96

On the condensate side, if Iran achieves a 1 mb/d refinery capacity by 2020, it can replace almost all of its condensate export with the light distillates produced in its refineries. Three major condensate refineries

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85 Ibid.

86 Ibid.

87 Ibid.

88 Ibid.

89 Iran’s Priorities for Developing Its Shared Oil and Gas Fields,” JFNA.


92 US Energy Information Administration, “Country Analysis Brief, Iran.”


94 US Energy Information Administration, “Country Analysis Brief, Iran.”


96 Ibid.
Table 6. Oil Refinery Capacity in Iran

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Abadan</td>
<td>360</td>
<td>400</td>
</tr>
<tr>
<td>Isfahan</td>
<td>370</td>
<td>375</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>320</td>
<td>330</td>
</tr>
<tr>
<td>Tehran</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Arak</td>
<td>170</td>
<td>250</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Tabriz</td>
<td>110</td>
<td>110</td>
</tr>
<tr>
<td>Shiraz</td>
<td>57</td>
<td>60</td>
</tr>
<tr>
<td>Kermanshah</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Lavan Island</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Bani As Sina</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>Booshehr</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Abad</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>1,864</td>
<td>2,039</td>
</tr>
</tbody>
</table>


4.1. DOMESTIC CONSUMPTION AND FUEL SUBSIDY REFORM PLAN

Lowering the Iranian domestic energy consumption rate is another part of Khamenei’s doctrine of an “Economy of Resistance.” Article 4 indicates that a significant reduction of domestic energy use could be achieved by implementing targeted, more focused, and effective subsidies. 

Reduction of fuel subsidies on the one hand, and increasing the refinery capacity on the other, are key factors in helping Iran control its domestic oil consumption. Both of these tactics could help Iran achieve independence in terms of domestic demand for fuel and gasoline. Although the Iranian government introduced an energy subsidy reform plan, in order to reduce the price subsidies on petroleum, natural gas, and electricity (and, by extension, overall domestic consumption), it still has a long way to go before achieving its goal. 

In 2012, Iran consumed 9.6 quadrillion British thermal units (BTU) of energy, of which oil and gas accounted for almost 98 percent of total energy consumption. Iran’s domestic consumption growth increased by 50 percent in the past ten years, and is expected to have an upward trend by 2030. Nevertheless, Iran’s subsidy reform plan helped with controlling the bullish trend in consumption of domestic refined petroleum, particularly gasoline. The Iranian government introduced the subsidy reform program to reduce subsidies on domestic fuel prices. The subsidy reform was designed to happen gradually, in order to prevent a shock in the domestic market. The first phase...
of this plan was implemented at the end of 2010. The second phase of this program was launched in April 2014, and the price for subsidized gasoline increased from 4,000 rials (16 cents) per liter to 7,000 rials (27 cents) per liter, and from 7,000 rials (27 cents) to 10,000 rials (42 cents) for free-market gasoline.

The subsidy reform plan was designed to reduce the gap between international and domestic prices, save the government money, and allow Iran to better manage its domestic consumption. Iran's Fifth Five-Year Development Plan (2011-2015) suggested that domestic gasoline prices should rise to about 90 percent of the free-on-board (FOB) prices of the Persian Gulf by the end of the plan (March 2015). Yet since 2011, mainly due to its sanctions-caused currency devaluation, the Iranian government has not saved significant money from reducing fuel subsidies. The rial's devaluation since 2011 has increased the gap between international and domestic prices for fuels, particularly gasoline. When the first phase of the plan was implemented in 2010, the US dollar was equal to 10,000 rials. In this scenario, Iran could manage to increase gasoline prices from 10 to 40 cents per liter, and save about 30 cents per liter. However, when the value of the rial dropped between 2012 and 2014, Iran's maximum savings from the fuel price subsidy reduction was only 16 cents per liter.

5. IRAN'S POLICY TOWARD ITS PETROCHEMICAL INDUSTRY

During Bijan Zangeneh's first term as oil Minister, from 1997 to 2005, he massively expanded Iran's petrochemical industry, increasing the value of annual petrochemical production from $1 billion to $18 billion. Investment in and development of Iran's downstream sector has always been part of Zangeneh's strategy, and, since his reappointment in 2013, this will continue to be part of his new team's plan. In 2014, Iran's petrochemical industry consumed 5 percent of Iran's total liquid and gas hydrocarbon production and produced about 41 million tons of products. Iran's petrochemical products represented 40 percent of Iran's non-oil export in the same year.

Zangeneh is planning to increase the petrochemical production nominal capacity from today's 60 million tons per year to 180 million tons by 2025. It is important to note that due to sanctions and lack of adequate feedstock, Iran's petrochemical production in 2014 was only 41 million tons per year below its nominal capacity of 60 million tons/year. Iran plans to supply most of the natural gas feedstock for its petrochemical factories from the South Pars gas field.

Expanding the petrochemical sector makes economic sense for Iran's economy, mainly because the country holds massive natural gas reserves. Being able to use natural gas as the feedstock of its petrochemical factories gives Iran a substantial economic advantage over its regional competitors.

Expansion of the petrochemical industry is also desirable because it is in line with Khamenei's "Economy of Resistance." Because sanctions have largely targeted Iranian crude oil exports, expanding downstream capability increases the share of non-oil petroleum products in the country's economy and serves as a way to lessen the impact of sanctions.

6. UPSTREAM INVESTMENT POLICY: ATTRACTING FOREIGN INVESTMENT

US and EU sanctions have had a significant long-term toll on Iran's infrastructure and have prevented adequate investment and technology from entering the country. According to Iran's latest five-year energy investment plan (2011-2015), Iran needs $255 billion worth of investment in its oil and gas industry in order to reach its target plans (see table 7). According to this plan, Iran needs to drill 2,500 wells—2,000 wells onshore and 500 wells offshore—to increase its crude oil production to the target level of 5 million barrels per day. Iran's petroleum ministry could not absorb the required investment, however; and is far behind its scheduled oil and gas development plans. This has hindered key natural gas reinjection projects, which are necessary to sustain production from matured oilfields, and completion and development of the South Pars gas field.

6.1. MODIFYING THE UPSTREAM INVESTMENT REGULATIONS

After 1979, Iran modified its policy toward foreign investors in its energy industry. In the late 1990s, Minister Zangeneh introduced a new type of contract that, for the first time since the 1979 revolution, allowed international investment in Iran's development projects of old oilfields. The new contract was named "buy-back" and its main goal was to enhance Iran's recovery factors.

105 The Iranian government issues a smart fuel card for each card, with 60 liters of semi-subsidized gasoline a month. Once the 60 liters in the card are used up, the extra amount of gasoline has to be purchased at the free market price.
107 "Iran's Priorities for Developing Its Shared Offshore Gas Fields," IRNA.
allowed the international investors to participate on exploration projects and work on its green fields. Iran’s petroleum ministry revised buy-back contracts for a third time in order to increase their incentives, to reduce investment risks, and to increase the flexibility of the contract terms for the investors.

Iran could attract around $50 billion of investment for its energy industry by offering buy-back contracts to international companies. Nevertheless, this type of contract was not successful in maintaining the investments and activities of international oil companies, such as Total and Eni, in its energy industry. Lack of IOC interest in the buy-back contract was further reinforced by international sanctions on Iran and by the situation in Iraq in 2004 and 2005. The Iraqi government and, in particular, the Kurdistan region offered more desirable contract models for investors. These hurdles along with tighter sanctions on Iran’s energy industry forced the country’s decision-makers to revise their investment contracts.

In 2013, for the first time, Iran’s Minister of Petroleum Rostam Ghasemi, former head of IRGC-affiliated Khatam-al Anbiya Construction Headquarters, offered production-sharing contracts for investment in upstream energy fields. During Ghasemi’s time, NIOC offered such a contract to an Indian consortium to develop the offshore Farzad B gas field, a shared field with Saudi Arabia located in the Farsi exploration block in the Persian Gulf. Upon resuming office, Zangeneh put a lot of effort and focus on revising Iran’s upstream investment contract models in order to once again attract international investors in the country’s energy sector. In February 2014, the committee that Zangeneh assigned for revising the investment regulations introduced a new type of investment contract. The new contract model was named ‘Iran Petroleum Contract,’ or IPC. According to this committee, IPC offers more desirable terms and incentives by providing investors with higher profits and implementing fees that are in correlation with the investment risks.

The IPC proposes a joint venture between an Iranian company and international companies for exploration, development, and production projects (see table 8). Involvement of foreign companies in the production process is one of the major differences between the IPC and the buy-back contract. Previously, international investors were only allowed to participate in exploration and development projects and had to leave the field by the time the production started. Under the IPC, international oil companies will have an active role in the production process—a very unusual concession, unseen since the inception of the Islamic Republic in 1979. This is the first time since the 1979 revolution that Iran will involve international oil companies and investors in the production process. The terms for the exploration projects are the other noticeable difference between the IPC and the buy-back contract. If no commercial resources are discovered during an exploration project, IPC allows the investing company to participate in another exploration project. According to the Iranian Constitution, “the ownership of the reservoir belongs to the nation and cannot be transferred.” But according to the IPC committee, the new investment model allows investors to include their revenue from projects in Iranian oil and gas fields in their annual monetary and financial reports.

The duration of Iran’s new investment contracts is almost double the length of buy-back contracts, between twenty

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Table 7. Iran’s Fifth Five-Year Energy Investment Plan, 2011-2015

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Upstream (Oil and Gas)</td>
<td>$155</td>
</tr>
<tr>
<td>Midstream and Downstream</td>
<td>$21</td>
</tr>
<tr>
<td>Hydroelectric and Steam-electric</td>
<td>$41</td>
</tr>
<tr>
<td>Petrochemical</td>
<td>$38</td>
</tr>
<tr>
<td>Total</td>
<td>$255</td>
</tr>
</tbody>
</table>

Source: Iran’s Ministry of Petroleum; US Energy Information Administration, “Country Analysis Brief, Iran.”

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113 Sara Vakhshouri, “Iran Offers New Terms for Oil Contracts,” ATLANTIC COUNCIL


115 Ibid.

116 Interview with Seyyed Mehdi Hosseini, SHANA, February 2014.
and twenty-five years. NIOC hopes to increase the quality of work and protect its oil and gas reservoirs by engaging international companies for longer periods of time. This will give the investors a more vested stake in the field and could create political advantages for the country, as investing companies would have long-term interests in Iran. Nevertheless, committing to a long-term investment contract involves more risk evaluation from the investing company, particularly given the current low-oil price environment.

The IPC model also creates an integrated investment plan for exploration, development, and production processes. By comparison, in the previous buy-back contracts, the investor had to enter a new bidding round after the exploration process and compete with other investors to gain a development project for the same field.

It is worth mentioning that, although the proposed terms in the new IPCs are much more flexible and have higher incentives than buy-back contracts, no international oil company will be able to invest in the Iranian oil industry until international sanctions are eased, following the implementation of the nuclear agreement reached between Iran and the PS+. The true test of the attractiveness of the IPC contracts will be seen in the months and years after sanctions are lifted.

6.2. NATIONAL DEVELOPMENT FUND

The National Development Fund of Iran (NDFI) was founded in 2011, based on Article 84 of the country’s five-year “socioeconomic development plan.” The NDFI was established as independent from Iran’s budget, and holds about 20 percent of all oil, condensate, and natural gas export revenue (after cost deductions) for investment purposes. Upon the removal of sanctions, Iran would have access to an estimated $100-120 billion of its foreign exchange reserves, currently frozen in escrow accounts abroad due to sanctions. The Iranian government is planning to provide international investors with some of these international reserves through agreements with international banks. This way, if Iran could not gain full access to its escrow accounts for some reason, it would still

117 In the case of natural gas, the central bank has to transfer 20 percent of the export revenue after deducting the value of imported gas. See: http://esfin.ir
120 Sham, Second South Caspian Summit.
be able to use these resources for investment domestically. However, lower oil prices and Iran’s budget deficit, along with lack of access to its oil income, will limit the NDFI’s resources. Moreover, Iranian officials have not yet clarified their priorities, or the procedure for allocating these resources to private investors.

6.3. INTEGRATING THE INVESTMENT PROCESS IN UPSTREAM, DOWNSTREAM AND PETROCHEMICAL

Iran is planning to offer an investment package to international investors, to integrate their investment in Iran’s energy industry so they can extract the hydrocarbon in the upstream sector, and then convert it to the final product in the downstream sector or petrochemical process. This will integrate the investment in upstream with downstream and petrochemical. International investors can take advantage of the discounted raw feedstock that they produced from oil or gas fields, and use it in a refinery or petrochemical industry in which they have invested. For instance, we could refer to Iran’s agreement with India for developing the Farzad B field, and involving Indian companies in investing in and sharing a petrochemical project in Chabahr. In other words, integrating India’s investment from developing a gas field all the way to developing a petrochemical factory, with the purpose of exporting the final product to India.

7. CONCLUSION

Iran, with its huge oil and gas reserves, has witnessed many ups and downs in its relations with other countries and international oil companies. In response to each challenge, Iran’s energy policy changed, moving it toward self-reliance. After the 1979 Islamic Revolution, years of sanctions and war prevented the energy industry from having continuous access to the necessary investment and technology. Since 2012, sanctions against Iran’s energy industry and oil exports intensified, due to conflict surrounding Iran’s nuclear program. In 2014, Khamenei announced the idea of the “Economy of Resistance,” with the aim of reducing dependency on oil revenue, and increasing value-added production by processing raw material domestically and exporting the processed material. Therefore, focusing on the downstream and refinery sector, as well as the petrochemical sector, will be a major component of Iran’s energy industry in the next decade. In regards to

<table>
<thead>
<tr>
<th>Table 8. Comparison between the Terms of the IPC and Buy-Backs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of contract</strong></td>
</tr>
<tr>
<td><strong>Duration of the contract</strong></td>
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<tr>
<td><strong>Fields of involvement</strong></td>
</tr>
<tr>
<td><strong>Investment returns in exploration project</strong></td>
</tr>
<tr>
<td><strong>Fees</strong></td>
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<tr>
<td><strong>Gaining of profit</strong></td>
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<tr>
<td><strong>Cost of operation</strong></td>
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</table>

## Iran’s Energy Policy and Diplomacy after the Nuclear Deal

<table>
<thead>
<tr>
<th>Goal</th>
<th>Strategy</th>
</tr>
</thead>
</table>
| Regaining and expanding the market share of oil, natural gas, refined petroleum products, and petrochemical products | - Adopt an oil-for-goods-and-services strategy.  
- Offer discounts on oil prices and transportation.  
- Engage buyers in investment contracts and production processes throughout the value chain (e.g., Iran’s agreement with India for developing the Farzad B field and involving Indian companies in investing and sharing a petrochemical project in Chabahar. In other words, integrating India’s investment from developing a gas field all the way to developing a petrochemical factory with the purpose of exporting the final product to India).  
- Involve IOCs in the production and exportation of the field’s product for a longer time in the upstream project. |
| Attracting investment and technology | - Create new upstream investment regulations with higher incentives (Iran Petroleum Contract).  
- Use the NDFI’s resources to lend money or share the investment project with foreign partners.  
- Integrate investments in upstream to downstream and petrochemical, in order to sell the final product to the investing company or its country. |
| Adding value to the production chain (reducing the share of export of raw resources and increase the non-oil export) | - Increase the domestic refinery capacity (for oil, natural gas, and condensate).  
- Increase the petrochemical capacity.  
- Convert natural gas to electricity and export electricity instead of natural gas. |
| Reducing its vulnerability to future sanctions | - Increase the non-oil export share.  
- Export the refined petroleum products and electricity, instead of raw resources.  
- Reduce and control domestic energy use.  
- Gain foreign technology as part of the upstream investment agreements.  
- Create long-term interests and increase the stakes of foreign companies and countries.  
- Create new channels for redirecting foreign reserves to international escrow accounts by giving funds to companies to reinvest in Iran or importing procurements. |
| Energy diplomacy | - Expand the energy exports to neighboring countries, particularly the GCC.  
- Increase economic ties with neighbors through investments and exportation of goods and engineering services.  
- Use neighbors as transit points for exporting energy resources, and vice versa.  
- Create long-term political relations with other countries, particularly GCC neighbors, European countries, India, China, and Japan, through long-term energy export agreements or involving them in long-term energy investments. |

hydrocarbon production, Iran will try to regain its pre-2012 crude oil production level, and put most of its effort and emphasis on the expansion of its natural gas capacity. The export of natural gas and the conversion of natural gas into electricity and petrochemical products are major components of Iran’s energy policy. Iran could also increase its condensate production as a byproduct of its natural gas production. Iran will also need to focus on controlling its domestic consumption growth, particularly to prevent a rapid growth in domestic fuel consumption.

Creating long-term energy trade ties is an important part of Iran’s energy diplomacy, as is engaging international investors for longer periods of time. Reaching a nuclear deal with the P5+1, and the prospect of rolling back sanctions, gives Iran an opportunity to come out of isolation and once again create ties with international partners. Tehran is planning to strengthen its economic ties with its Arab neighbors and its neighbors north of the Caspian by exporting oil, gas, refined petroleum products, and electricity. Also, by reforming its upstream investment regulations, Iran would create longer ties with international investors.

The outline of Iran’s energy policy and diplomacy after the nuclear deal are detailed in table 9.

MARKET IMPACTS TAKEAWAYS

Sanctions removal and immediate impact on the global energy market: Since the start of sanctions in 2012, Iran lost more than nearly half of its market share, and its exports dropped by more than 1 mb/d. Hence, NIOC’s primary goal after the sanctions rollback would be to gain its pre-2012 position as the second-leading oil exporter in OPEC, and to try to increase its oil exports to 2.5 mb/d. However this increase will be gradual, both because of technical issues and because of the required time for marketing and sale of its extra oil at a time of oversupply in the market. Depending on the timeline of the sanctions-unwinding process, Iran could increase its exports of crude oil about 400,000-500,000 kb/d by mid to end of 2016. Iran could also add an additional 150,000-200,000 b/d of condensate to its liquid export volumes by mid-2016. Iran’s petroleum minister announced that he is ready to add 500,000 b/d of oil to its export upon the removal of sanctions, and additional 500,000 by mid-2016, and part of this additional oil would be condensate. At the same time, the sanctions rollback on Iran, and the prospect of the country increasing production, could have an immediate, psychological effect and downward impact on the international oil prices.

Long-term impact: Iran’s main focus will be the development of its natural gas fields, particularly the South Pars giant gas field. Iran’s natural gas and condensate (byproduct of its natural gas fields) production is expected to increase significantly in the next 3-5 years. Iran is going to utilize its additional natural gas capacity in different ways: 1) To export natural gas, particularly to its neighbors, in order to increase its gas export market share and also as part of its energy diplomacy to create long-term energy alliance. 2) To convert part of its natural gas into electricity and export electricity to its neighboring countries, with the goal of increasing the value added to its natural gas and also diversifying its exports products. 3) To use its natural gas as the feedstock of its refinery plants. Iran’s current petrochemical production capacity is about 60 million tons/year, and the country is planning to increase this capacity to 180 million tons/year by the end of 2025. Most of the natural gas feedstock of its petrochemical factories is expected to be supplied from South Pars gas field.

Iran’s condensate production will also increase to 1 million b/d by 2017, and Iran is planning to increase its condensate refinery capacity by the next 2-3 years, in order to refine most of its condensate domestically and export the refined products instead of condensate. Therefore, it is important to note that Iran’s major energy impact in the middle and long terms will be on the global downstream (refined petroleum products) and petrochemical markets.
ABOUT THE AUTHOR

Dr. Sara Vakhshouri is a Nonresident Senior Fellow at the Global Energy Center and the President of SVB Energy International.
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List as of November 5, 2015
The CHAIRMAN. Thank you, Doctor.
Mr. Webster, welcome.

STATEMENT OF JAMIE WEBSTER, SENIOR DIRECTOR OF
GLOBAL OIL MARKETS, IHS

Mr. WEBSTER. Thank you very much, Chairman Murkowski, Ranking Member Cantwell, members of the Committee, I appreciate the opportunity to testify before you today on global oil markets and the potential and actual impacts of terrorism on oil prices and energy security both globally and here in the United States.

Today I appear before you in my capacity as Senior Director for IHS where I lead the company’s global oil markets team. IHS is a research consultancy that specializes in energy, capital intensive industries, data and analysis with a worldwide presence.

The current era of oil abundance and low oil prices does not eliminate the issues with geopolitical and terror risk though they may seem to have faded, at least from a global oil standpoint at this point. With the rise of ISIS via the gaining of significant Syrian and Iraqi territory in 2014 and an increase in terrorism globally, this risk is going to be growing over the next several years. And the likelihood of what is called the risk premium or the fear premium in oil, oil prices, is likely to return.

But this, so this temporary measure where we don’t have that is as a result of low oil prices due to the United States bringing on increased production as well as OPEC deciding not to change its policy, both at the Thanksgiving, November 27th, meeting last year and most recently last Friday where they had decided not to have any sort of production level at all.

Instead actually OPEC has actually increased its production by about 1.5 million barrels a day since last fall with significant increases from Saudi Arabia and Iraq. These have helped to push down prices even further but are coming at a cost. And that cost is lower OPEC spare capacity or the amount of additional production that a country could bring on should it choose to do so.

This past summer the increased production out of OPEC caused their spare capacity to reach levels as low as 2.6 percent. The historic rule of thumb for OPEC’s spare capacity for stable prices is generally four percent. The reason why we’ve been able to go so low at this particular point without price spikes is precisely because we are in a very oversupplied market and this is partly due to the United States.

This calculus, however, may shift as soon as the middle of next year when the daily over supply, that is that amount of barrels that we are putting into global stocks around the world, stops building and we actually start potentially drawing at the same time that OPEC’s spare capacity effectively vanishes and moves back down on a seasonal basis. This then spare capacity level means that in a time of heightened supply risks it will be incumbent upon available stock piles, both strategic and commercial, as well as the ability to bring on incremental supply, most likely from the United States to assuage any real or perceived shortfall.

This shift from OPEC’s spare capacity to a new form of supply security that is provided in part by U.S. productive capacities will take time for the market to calibrate and clear signals in terms of
a policy standpoint would be greatly appreciated by the market at this particular time.

The flexibility of U.S. production growth really comes from a timing issue on both the up and down side that is that they can increase production quite quickly because the amount of time that is needed to bring production on is only about four months verses conventional production where it can take several years to bring that production on. This means it can have a much greater effect in terms of bringing production back on line.

These production outages that have plagued the oil market for the last several years are likely to increase in the future. Right now, since 2012 we've got an increase in terrorist attacks per IHS of about 25 percent with increases in attacks on energy infrastructure by about five percent. This means that over the next couple of years geopolitical risk is very much going to come back into the market.

In order to address these or now that this shift from the OPEC toward the United States, comes with it a huge opportunity for the United States to help shore up not just national energy security but global energy security and the two ways that I would say that it would be most helpful is one, by allowing U.S. crude oil exports. And allowing U.S. crude oil exports gives U.S. producers the opportunity, should it make sense, to export oil in an order to both allow them to increase their own production and be able to get more oil out on to the global market.

The other aspect is one of having a very clear stock policy both on a commercial side and on a strategic stock pile side. By having significant stocks within the United States that are in areas that we know that are safe, we can actually increase overall energy security.

With that, I appreciate, Chairman Murkowski, your leadership and Ranking Member Cantwell, your leadership as well on this and would appreciate and happy to take any questions.

[The prepared statement of Mr. Webster follows:]
Chairman Murkowski, Ranking Member Cantwell, and members of the Committee, I appreciate the opportunity to testify before you on global oil markets and the potential and actual impacts of terrorism on oil prices and energy security.

I appear before you in my capacity as Senior Director for IHS where I lead the company’s short term crude oil markets team. IHS is a global research consultancy that specializes in energy, capital-intensive industries, data and analysis with a worldwide presence.

The current era of oil abundance and low oil price does not eliminate the issues associated with geopolitical and terror risk. With the rise of ISIS, via the gaining of significant Iraqi and Syrian territory in 2014 and an increase in terrorism globally, geopolitical and terror risk is likely to be a growing issue for oil markets over the next several years. The capture of Iraqi territory by ISIS in summer 2014 was quickly followed by the start of the oil price decline in summer of 2014. However it was the rise of US shale oil production amid OPEC policy inaction, plus weaker demand growth that has helped keep the price at lower levels. Because of the surplus supply there is much less talk of a “risk” or “fear” premium in oil markets than has been the case in years past. However, this does not mean that the current era of abundance eliminates the issues associated with geopolitical and terror risk. Instead it has temporarily expanded
Jamie Webster, Senior Director of Global Oil Markets, IHS

the markets ability to cope with such stresses. However, geopolitical and terror risk have not gone away and are likely to be a much bigger issue over the next several years.

A large and still growing global stockpile of oil and petroleum products, and the looming full return of Iranian oil have allowed the market to internalize a view that oil prices will remain lower for longer. Despite this view, risks are rising. According to IHS Country Risk raw data, terrorist attacks on upstream and downstream oil infrastructure have risen 5% since 2012, while total terrorist attacks have increased 25% through November of this year. These numbers may make it appear that energy infrastructure is not a key priority for terrorists, but the outsized impact a successful attack could have on energy security is a concern.

For now, successful attacks are largely concentrated in just a few countries—more than 90% of attacks have occurred in ten countries each year—though those countries have shifted over the last several years. Among the top 10 countries sustaining the most attacks since the start of the Arab Spring, Iraq, Nigeria and Egypt are of particular concern given their importance for crude oil supply or oil transit.

In November 2014, OPEC took a stance that it would not cut production in the face of oversupply given the view that it could not compete against the large volumes of higher cost oil elsewhere in the world amid weak demand growth. There was also some concern from Saudi Arabia about maintaining exported volumes in the face of potential and actual production increases from Iraq and Iran. This stance was reaffirmed in the meeting on December 4 of this year, with the organization abandoning any attempt at identifying a production target. Despite the lack of policy action, the OPEC countries as
a whole have rapidly increased production. As a result, production from OPEC members is up approximately 1.5 million barrels per day since last fall, with significant increases from Saudi Arabia and Iraq. These increases have helped to push prices down further but are also coming at a cost -- lower OPEC spare capacity or the amount of additional production a country could bring on should it choose to do so. This past summer, increased OPEC production caused their spare capacity to reach levels as low as 2.6%. The historic rule of thumb for adequate spare capacity for OPEC was around 4%. Recent low spare capacity occurred in an oversupplied market with the added cushion of more than 700 million barrels of additional crude and refined products in inventories since the beginning of last year.

Lower oil prices are slowing supply growth, and by the middle of next year the calculus will shift as the daily oversupply likely vanishes from the tightening market as supply slows enough to meet demand growth and OPEC spare capacity again decreases seasonally. This thin spare capacity level means that in a time of heightened supply risks, it will be incumbent upon available stockpiles, both commercial and strategic reserves, as well as any available incremental US supply, to assuage any real or perceived supply shortfalls. This shift from OPEC spare capacity to a new form of supply security that is provided, in part by US productive capacities, will take time for the market to calibrate and be able to assess effectively.

The flexibility of US production growth comes from a timing issue on both the up and down side. Conventional production projects can take years to finance, plan and bring to the market. US shale producers can do it in 4 months. Globally, conventional production has a decline rate of 5-6%, meaning a project will be producing that much
less each year. US shale production has an initial decline rate of about 50%. These two factors allow the US shale system to react quickly to market signals bringing more oil onto the market, and reducing supply through lower investment when prices turn downward can reduce supply.

Production outages have plagued the oil market for the last several years and have been caused by war, strife as well as terrorism and sanctions. Historically, outages have generally been assumed by IHS to be about half a million barrels per day, but since early 2011 with the decline of Libyan production due to the civil war, this number has been much higher, with some months since then as high as 3.5 million barrels per day. Historically, one would expect this number to decline, but due to the greater instability in the region, there is just as much likelihood that it could rise. Some of these production outages have since been captured by ISIS, which uses these revenues to help fuel its operations.

IHS released a new report that ISIS, before the most recent campaign, was deriving about 45% of its revenues from oil, around $33 million dollars per month, with the bulk of revenue coming from taxation and confiscation\(^1\). This figure assumes about 30,000 barrels per day of oil, a number that provides significant revenues to the group but does not impact global oil markets. For comparison US production increased last year by 1.4 million barrels per day. It is likely the ISIS volume has since declined in recent weeks from recent bombing attacks. The group has also established a foothold in Libya. With Libya production, now at about 400,000 b/d, well down from the pre-civil war level of 1.6 million barrels per day, there is much less production downside for oil markets, but it creates immense potential additional revenues should it be able to secure some of the

\(^1\) See IHS press release at [http://on.ihs.com/1TS9esP](http://on.ihs.com/1TS9esP)
multiple terminals along the coast. In addition, the country is well positioned to be a springboard to launch attacks against energy assets in Egypt and Algeria, in line with the strategy employed in Iraq and Syria.

Given the risks posed by terrorism and outages in the future, addressing energy security issues in oil markets is key to ensure available energy to meet demand in the future without the deleterious effects of high prices. The United States production growth helped to push prices lower. These lower prices have brought dramatic benefits for consumers and put additional pressure on groups that have traditionally relied on oil revenue to sustain their economies.

The shift from OPEC toward the United States, in terms of oil supply response contains within it a huge opportunity for the United States to help shore up not just national energy security but global energy security. US imports of crude and refined products have diminished markedly over the past several years but this does not mean that the country has disconnected from global oil markets. Increasing US and global energy security can be helped by assisting the capacity for a rapid supply response from the United States when needed. Market incentives alone will help push US oil producers to produce more as prices rise, but the current crude oil export policy can also limit the full upside of this production increase.

The US has a liberal trade policy for natural gas, coal, refined products and processed condensate. It is seeking new agreements to further promote trade with both Asia and Europe. It also allows crude oil exports to other countries in certain, very specific cases. Allowing US producers to seek out international markets for their product will
Jamie Webster, Senior Director of Global Oil Markets, IHS

allow them to receive global prices, while supporting job growth across many industries and in places far from the oil fields. It would also help to lower the price of Brent, the benchmark price for global oil, much as the increase in production already has. Lowering the Brent price is the access point to lower US gasoline prices as U.S. gasoline prices are linked to the Brent world price, not the domestic WTI price. To fully maximize US savings at the pump, exports should be liberalized to ensure this dated policy does not cause an unnecessary drag on American productivity, while hampering our ability to exploit fully the national security benefits from this energy resurgence. The reasons are intertwined with the nature of the American refinery system and the price discounts that American oil producers must frequently take in order to sell their products competitively to refineries, particularly along the Gulf Coast, which holds over half of the nation’s total refining capacity. Over $85 billion has been spent in the past quarter century to reconfigure these refineries to process lower cost heavy oil imported from countries like Venezuela, Mexico and Canada. The United States contains the largest refining capacity of any country in the world, with 139 operating refineries with a combined crude oil distillation capacity of about 18 million B/D. The US refining system is characterized not only by the number and size of refineries but also by a high number of world-class, high-complexity, full conversion refineries with a substantial degree of petrochemical and specialty products integration. Allowing crude oil exports increases market efficiencies and ensure higher value US crude oil is unhampered by a price discount to international markets. The ability to hold crude and refined product stocks is also key to reducing the risk by providing the ability to supply customers if oil supply is disrupted. Inventories are high
Jamie Webster, Senior Director of Global Oil Markets, IHS

with nearly 700 million barrels per day accumulated in stockpiles around the world, but of this most of the stocks that can be easily drawn down are in the United States. This commercial capacity, along with substantial stocks in the US Strategic Petroleum Reserve remains critical in a supply shortfall despite the US’ lower imports (as a result of the production boom in the country). Terrorism and instability will become a bigger risk for oil markets over the coming year, but the US has a real opportunity to address these risks in a way not possible prior to the US shale boom.

I appreciate, Chairman Murkowski, your leadership and that of this Committee to address these critical issues for US, regional and global energy security. Thank you for this opportunity to testify before your committee. I welcome the chance to respond to your questions.

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About IHS (www.ihs.com)

IHS (NYSE: IHS) is the leading source of insight, analytics and expertise in critical areas that shape today’s business landscape. Businesses and governments in more than 150 countries around the globe rely on the comprehensive content, expert independent analysis and flexible delivery methods of IHS to make high-impact decisions and develop strategies with speed and confidence. IHS has been in business since 1959 and became a publicly traded company on the New York Stock Exchange in 2005. Headquartered in Englewood, Colorado, USA, IHS employs almost 9000 people in 32 countries around the world.
The CHAIRMAN. Thank you, Mr. Webster.

A lot of issues have been raised here this morning. It seems to me that we could have two separate hearings. The points that you have hit on in your testimony, Mr. Webster, talking about the energy security, national security implications of all that is happening within these oil markets is certainly one aspect of it. Then, kind of, following off Senator Cantwell's words of following the money in terms of what is funding terrorist activities, is certainly something that again, we could spend all day trying to understand how and where we can make a difference.

Mr. Harrell, I want to begin with you because you have helped break it down in terms of how we see the financing. Oil is a very significant piece, as we have mentioned maybe about 40 percent, but this other category is also quite substantial.

You have suggested that one of the better ways to choke off the supply of funding is to escalate military targets, but you also indicated that you do not feel international sanctions can be that helpful. You did indicate though that sanctions on import of oil production equipment is one area where we can specifically target it.

We try to figure out here what sanctions may or may not be effective. Can you go a little bit more into detail in terms of other areas where you think that sanctions are helpful or where they really are not helping given the situation on the ground in the Islamic State?

Mr. Harrell. Thank you very much, Senator Murkowski, for that question and giving me the chance to elaborate.

I certainly did not mean to imply that sanctions are not useful. I think sanctions are absolutely useful in this context. But I think that given that the majority of the revenue that ISIS generates from its oil sales is generated internally sanctions are going to have to play a supporting role, an important role, but a supporting role with the military effort being the most important way of targeting the income.

A couple of areas where I think sanctions can and should be deployed, and I should begin by noting that I think that my former colleagues at the Treasury Department are working very actively on this set of issues.

First, as I discussed, there is some oil seeping out from ISIS-controlled territory into adjacent countries. And clearly, both the U.S. Government and our partners should be taking every step they can both to seal the borders and to destroy the oil coming out and should also be working to impose financial sanctions on the buyers of that oil whether in the Kurdish autonomous part of Iraq, in Turkey, in Jordan or elsewhere.

Another area that I think sanctions could be quite useful is to go after ISIS' procurement networks, particularly for spare parts related to oil infrastructure. As the military tempo increases, ISIS is obviously going to be seeking to increase its procurement of replacement parts.

As I discussed and as Dr. Crane discussed, a lot of this is fairly low tech kinds of equipment that they need and the Middle East, Syria, Iraq, Turkey, are awash in oil equipment. So this is not going to be an easy task, but clearly sanctions should be im-
posed on anyone looking at selling oil-related parts into ISIS-controlled territory to keep those out of ISIS.

The final area that I think sanctions could be useful is in ensuring that ISIS continues to be cutoff from the international financial system. Most of their revenue is cash. They're piling up increasing quantities of cash in their own territory in cash houses and elsewhere.

It is a cash-based economy there. They probably want to keep most of their revenue in cash. But as the cash piles up and as they try to support affiliates and allies outside of their core territory, they're clearly going to be looking for ways to move that money, some portion of that money, out of their territory into the international financial system.

The CHAIRMAN. Mr. Harrell, I am going to interrupt and ask with the remaining seconds of my time a question about Libya. We talk a lot about what is going on in Syria, Iraq, Iran and Libya, as we all remember, was a very difficult place and is still a very difficult place with the level of violence and civil unrest.

Mr. Webster, in terms of how Libya represents a potential source of revenue for ISIS, how does that factor into the discussion today?

Mr. WEBSTER. Thank you for your question, Chairman Murkowski.

I think it is actually quite important. Realize that Libyan production before the civil war was 1.6 million barrels a day which, of course, dwarfs the 30,000 or 40,000 barrels a day that ISIS is controlling now. Right now because of a variety of issues within the country, it's about 300,000 or 400,000 barrels a day. But obviously there is still an immense amount of upside in terms of production out of Libya.

Additionally Libyan production, as I think you said in your opening comments, is light, sweet oil which was actually, a shortage of that was actually one of the drivers for driving up prices in 2008. My understanding is ISIS has got a foot hold in Sirte and is seeking to control some of those terminals and some of those other access ways for oil. So it is a big concern in terms of both the amount of oil and then what ISIS could potentially do with that, particularly as that could then be pushed into and allow them to create additional energy attacks in Algeria, Egypt and other places from within Libya.

The CHAIRMAN. Thank you.

Senator Cantwell.

Senator CANTWELL. Thank you, Madam Chair.

Continuing with vulnerabilities, well actually I have two questions, one to you, Mr. Webster, which is about the transportation and infrastructure and SPR that we need to worry about, and there are other things, like the Strait of Hormuz, which approximately 19 percent of all oil travels through. So that, I would assume, would represent an opportunity for someone and a concern. When you look at the transportation infrastructure overall vulnerabilities, targets that we need to harden, how important is it that we keep the Strategic Petroleum Reserve modernized?

And Mr. Harrell, back to a very specific regional question. I think mentioning that the refining capacity in the ISIS region had been taken out is the hardest to rebuild. But the actual oil produc-
tion, I mean, you can bomb that, but it is not difficult to still continue to get the oil. So this point about following the money and what kind of impact could it have to get the Assad regime off of the oil from an economic perspective.

So, Mr. Webster?

Mr. WEBSTER. Thank you, Ranking Member Cantwell.

The importance of transport and the importance of being able to get oil and refined products to people is obviously very critical, and that's actually particularly critical for the Strategic Petroleum Reserve. We've got just under 700 million barrels that are residing there currently.

And while it would appear that right now there's really no use for it at all in that we've got plenty of supply here in the United States, it's incredibly important to be able to hold onto that and also to be able to access that. And because of a variety of changes in terms of logistics in the region as well as the changing in terms of the types of crude that we're importing and the types of crude that we're making within the United States, that ability to tap that, both in terms of its volume, but also in terms of the timing, is incredibly important even though right now it appears that there's really not much use for it.

Senator CANTWELL. Okay.

But in general making sure that we are protecting these—if you were looking at terrorism overall, protecting these transportation sectors of the major supply is something we should be concerned about?

Mr. WEBSTER. Absolutely agree with that, yes.

Senator CANTWELL. Okay.

Mr. Harrell.

Mr. HARRELL. Thank you very much, Senator.

Absolutely agree. I think if you look at the external buyers of ISIS oil, the Assad regime and natural gas, the Assad regime is front and center of that.

As you said, Senator, in your opening remarks, I think it would be incredibly useful for Russia which has basically played a destructive role in Syria to date, to use the leverage it has over the Assad regime to try to get them to cut out buying oil and gas from their own enemy, ISIS, because that indeed the largest external purchaser of ISIS-produced hydrocarbons.

Senator CANTWELL. What about the impact of bombing the actual wells? How is it for them to recover and they have had these modular systems. So what are we doing here and why is this important to then focus on the money aspect?

Mr. HARRELL. Thank you very much.

So as you noted last year when the military began bombing these modular refineries in Syria, ISIS basically adapted and they moved, or really the people refining the oil moved, to what Dr. Crane described as these tea kettle refineries where the oil is just, sort of, boiled in open pots and refined in a very crude way.

From a military perspective those are easy to repair as are the well heads. I think from a military perspective keeping up the pressure on those targets, so you know, they know that if it's going to take them a week or two to repair it it's going to be hit again right
away rather than getting a couple of months of production out of that before it’s hit again.

Keeping up the tempo, the operational tempo, of the military targets is important as is the steps that the military has begun to take on the distribution networks, trucks and things like that.

But to your point, we very much need to focus on what happens with the money after ISIS earns it from the oil revenue. I think from a military front there are things that can be done in terms of targeting cash houses and raids on high value targets. Military will say the attack, the raid on Abu Sayyaf, who is an ISIS financier, the financial manager, earlier in the year was a very important step. I think things like that can happen.

And then again, keeping up the pressure on money exchange houses and sort of, informal oil wallahs that might help ISIS move its cash out of its territory into the rest of the world.

Senator CANTWELL. So you are saying we need to be as adaptive to move and as they try to come up with new techniques we need to be adaptive to move fast as well.

Mr. HARRELL. Absolutely.

Senator CANTWELL. Thank you.

Thank you, Madam Chair.

The CHAIRMAN. Senator Daines.

Senator DAINES. Thank you, Chair Murkowski, Ranking Member Cantwell, for having this hearing on this very, very important issue.

Our national security, protecting our families from terrible acts of terrorism, I can tell you, is on the minds of Montanans every day as I travel around the state. It is telling to us today how important, I believe, energy independence, American energy independence and security, is to our safety, to our prosperity as well as the entire world.

So count me in. I think many here on the dais believe we should remove the ban on U.S. oil exports and move forward here in continuing the U.S. in leadership in the way of production. The irony, to think that the President just moved forward with removing the ban on Iranian oil exports and we are the only nation in the world that still has a ban on its exports, I think cannot be overstated. I hope we will soon remove that ban. It is good for the American people, it is good for our economy, and I think it is good for the world.

As we look at what is going on right now with ISIS and as the testimony heard today that one of their leading sources of revenue certainly is from oil production, it seems like it is pretty clear there are two parts of our strategy. One would be to increase U.S. oil production which hopefully we will be working to address that through removing the oil export ban. The second is destroying ISIS oil production and revenues, that two prong attack.

In the last couple of months we unfortunately have seen the second largest terror attack in Europe since 9/11. We have seen the largest, most lethal, terror attack on our soils since 9/11. And interestingly enough it seems like suddenly the tempo on attacks on the oil assets of ISIS have increased.

My question is for Mr. Harrell. I have heard the Administration say the intelligence has changed and so forth, but I am not convinced. Mr. Harrell, you said one of the most effective ways of
fighting ISIS is to launch attacks on its oil infrastructure; however, CIA Director Morell said on Charlie Rose here a couple weeks ago that one of the reasons the U.S. was not doing this was because of environmental concerns coming from the Administration. Do you think that made sense?

Mr. HARRELL. Thank you, Senator, for the question.

Clearly the Administration has had a number of concerns over the last year as it has thought about the operational tempo of attacks including the need to gather intelligence and the need to gather knowledge about what collateral costs might be whether to civilians or future Syrian production.

Certainly in my view right now, given the threat we are facing from ISIS, the attacks we and our allies have faced over the last month, while it is important to consider collateral costs, the near-term benefit of taking out revenues needs to weigh very heavily on that scale.

And so I do think it’s important that we assess and maintain, you know, well although assessing the costs we maintain a very robust operational tempo and focus on taking out the oil infrastructure, obviously while minimizing to the extent we can those kinds of collateral costs.

Senator DAINES. Wouldn’t it make sense, there have been the words used by the Administration it is trying to contain ISIS. I think many of us believe that it is about destroying ISIS. And back to your testimony saying that their leading sources of revenues are from oil, if we cut off their revenues that would be a very, very important part of destroying their capabilities to launch their terror attacks around the world.

Mr. HARRELL. I very much agree with that. I think it is clear that ISIS is not a threat we should contain. ISIS is a threat we need to destroy. I very much agree with you, Senator.

Senator DAINES. Thank you. Thank you.

Mr. Webster, let me get your thoughts on that as well. We have heard these comments that perhaps the limited attacks in Iraq and Syria have been related to environmental concerns of the Administration. Now suddenly after these two large attacks, one in Paris, one in San Bernardino, suddenly the strategy changed. Any insights there?

Mr. WEBSTER. Senator, it’s a little outside of my expertise in that I’m just a global oil markets guy, but I would agree with Peter that it does seem when you are looking at this in terms of, you know, the cost, as it were, in terms of collateral damage against what ISIS brings, particularly as I am looking at around the world and looking at increased risks to the global supply system over the next several years. And so anything that could be done that can actually roll that back and put that into a better posture would be a positive thing for the oil market.

Senator DAINES. Yes, and this gets back to the point we do not want politicians running this war; we want the U.S. military to run it. If we intend to destroy ISIS, let’s destroy ISIS.

Mr. Webster, a question for you is how do you think removing the ban on crude oil exports will help reduce the world’s risk to terrorism?
Mr. Webster. So by removing the export ban on the U.S. what it does is it allows the U.S. producers to ensure that they don’t get such a big discount compared to global prices. So that maximizes their price or as I would call it, essentially removes what has in the past been what I had termed a policy discount.

Now at this particular time because of high refining runs in the United States and because of the low price and because we have lower production, you probably actually wouldn’t see a whole lot of barrels leave the country if you actually allowed crude oil exports today. However it’s important still to change this policy because by changing this policy it actually supports U.S. production growth in the future rather than doing it when it suddenly becomes an emergency, sort of, nature.

So it’s an important policy for us because it allows us to increase U.S. production. And by increasing U.S. production, as we all know, the U.S. production is, what I would argue, a much safer place for production to come from rather than other countries. And so that increases overall energy security, not just in the United States, but actually on a global basis. And it must be remembered that oil markets is a global market.

Senator Daines. Thank you.

The Chairman. Thank you, Senator Daines.

Senator Heinrich.

Senator Heinrich. I want to thank Senator Daines for his questions. I think they get to the heart of a number of these issues. But I would certainly encourage him, rather than listening to the former Director of the CIA on Charlie Rose, to talk to our current Director of the CIA and also the folks at DOD who have been doing this targeting.

The intel has changed. The Abu Sayyaf raid was a major coup and has, I think, made our efforts much more successful. But one of the things in talking to DOD folks I think is very important is how you make this targeting more successful while also mitigating and minimizing the fodder for ISIS to run this highly effective, inspirational, social media campaign which has been an enormous problem for us. Obviously what happened in California was not directed. It was inspired, and we need to keep that in mind.

Mr. Harrell, in the past you have said that the targeting has had limited impact on combating ISIS’ ability to generate funds and that their oil revenues are largely unchanged. Has the recent shift in terms of the oil tanker trucks, has that moved the needle substantially in your opinion and to what proportion in terms of their overall revenues?

Mr. Harrell. Thank you very much, Senator, for the question.

I should begin by saying facts on the ground, you know, on a short turn, a turnaround time frame are hard to gather from that part of the world. It certainly does appear, though, with that caveat that the military campaign, the escalated military campaign, is having an impact.

It is clear that it is serving as both, obviously taking trucks out has an immediate impact. The results are serving as a deterrent to people who previously thought they could make some quick bucks loading oil and selling it, maybe thinking they need a new line of work.
So I do think it is clear that the impact on the trucks is having an impact, the attacks on the trucks are having an impact. I also think the larger scale strikes in the oil and gas separation plants, these are larger pieces.

Senator HEINRICH. Right.

Mr. HARRELL. The infrastructure. I think that is definitely having an impact. So I think what we are seeing is a useful and very welcome operational tempo that I hope is maintained going forward.

Senator HEINRICH. I would agree with that estimate.

Do you have opinions on whether it makes sense, in addition to targeting the sort of large, industrial scale infrastructure like the separation plants? Does it make sense to try and target these very small, sort of, teapot refinery operations?

Mr. HARRELL. I think that is an excellent question.

I think that I would note two kinds of cautions about whether it makes sense to attack the teapot refineries.

First is by all assessments they are not actually directly run by ISIS. ISIS runs well heads directly. It runs the large PC infrastructure. These are run by, you know, entrepreneurs who have the unfortunate reality of living under ISIS control. I don’t, in any way, want to defend what they’re doing refining the oil but they’re not, sort of, ISIS employees, so to speak.

They’re also really are very simple kinds of things that are easily repaired. So I think that, you know, if there was a way to do it while minimizing civilian casualties and at a tempo that you can actually take them out of commission, maybe. But I think hitting those two criteria actually in practice is going to be somewhat challenging.

Senator HEINRICH. Yes, I think that is exactly the challenge that our targeting folks at DOD find themselves wrestling with each and every day.

Dr. Crane, I want to ask you something that is related to this although it does not directly touch on the oil financing piece. I want to understand how substantial is the economic impact of the Iraqi Government continuing to pay the salaries of Iraqi employees who live in ISIS-controlled territory? How big a problem is that because obviously those salaries that get taxed by ISIL as well and much of that money is, sort of, trapping up that economy in that contested area?

Dr. CRANE. Excellent question.

Fortunately the Iraqi Government has stopped paying to Mosul. However my understanding is that some of the Anbar communities continue to be paid. I couldn’t think of a better policy decision. And I think the first decision on stopping payment in July and Mosul was probably the single biggest impact on ISIL finances that has taken place so far.

Senator HEINRICH. So diplomatically we should be pursuing——

Dr. CRANE. Absolutely.

Senator HEINRICH. A complete cessation of financing those salaries throughout, not only in Mosul, but in Anbar and any ISIL-held territory within Iraq.

Dr. CRANE. Although hopefully Ramadi will and Fallujah later will soon not be under ISIL control.
Senator HEINRICH. I couldn't agree more.
Thank you.
The CHAIRMAN. Thank you, Senator Heinrich.
Senator Cassidy.
Senator CASSIDY. Thank you all. This is a very stimulating dis-
cussion.
First, Madam Chair, I would like to submit for the record an edi-
torial we just published yesterday as regards the nexus, if you will, 
between exporting U.S. oil and actually reducing global CO2 equiv-
alent emissions and reducing funding for terrorism.
The CHAIRMAN. We will include that as part of the record.
[The information referred to follows:]
As the Paris climate talks continue, President Obama has repeatedly made clear his belief that no challenge poses a greater threat to future generations than climate change. The president and his administration have attempted to lower greenhouse gas (GHG) emissions by limiting domestic oil and gas production on federal lands, continuing the 40-year-old crude oil export ban (presumably to decrease oil consumption worldwide) and imposing regulations on the U.S. oil and gas exploration industry, designed to restrict U.S. oil production. This, while the president’s Iran agreement allows Iran to increase oil production by 2 million barrels per day by 2025 and gives them access to new global markets. If Obama wants to lower GHG emissions and simultaneously address the fact that most Americans think the greatest threat to America is the oil export ban, he should allow Americans to explore for and export oil.

Unlike Iran, the U.S. has a long-standing commitment to conservation. America leads the world in both emissions reductions and production of oil and natural gas due to industry investment and advanced technology. While pushing the Iran deal, Obama failed to mention that Iran does not share our commitment to reducing emissions from oil production. The International Council on Clean Transportation and the Carnegie Endowment for International Peace observed that Iran would almost triple their GHG per barrel during production of crude oil than that of U.S. producers in the Gulf of Mexico. Major oil rigs in the Gulf of Mexico emit 0.01 and 0.004 metric tons of CO2 equivalents, a measurement of greenhouse gas emissions, per barrel while Iranian oil fields emit 0.070 to 0.100 metric tons of CO2 equivalents per barrel. If this seems small, understand that if Iran increases oil production by 2 million barrels per day due to a vacuum the U.S. leaves in the market, they will emit 630,000 metric tons more of CO2 equivalents per day. In a real sense, either the U.S. or Iran will supply oil to the international oil market. If Iran does, more GHG is emitted.

Despite this, less than one month after the president gave Iran access to export oil, he issued a threat to veto legislation that would allow U.S. oil exports. Both Republicans and Democrats support lifting the current crude oil export ban. But in 1975, Oil was an outdated policy that denied American companies access to the global oil market. It also denied jobs and economic growth to Americans and the American economy.

According to the Aspen Institute, if the crude oil export ban was lifted, domestic crude oil production could increase by 1.35 million barrels per day by 2025. GDP would increase by $165 billion in peak exploration and development years (2019-2021), continuing at $141 billion per year in 2025. As 60 percent of GDP is typically part in taxes to the federal government, this is $38 billion per year toward domestic needs, such as paying down debt and financing defense and security. Related to this, a total of 350,000 jobs would be added at the peak in 2019. America’s household income would increase by $2,000 to $3,000 in 2025. Conversely, the Iranian Central Bank predicted that increasing foreign oil production and lifting the sanctions could mean their growth rate would increase to 6 percent. This is the same economy that finances terrorism throughout the Middle East and continuously undermines the stability of its regional neighbors, including Israel, Egypt and Saudi Arabia, which ever country fills the international need for oil will advance its country’s goals. It should be the U.S.

Despite lower GHG emissions and the economic and security benefits of increased domestic energy production, the Obama administration has slowed energy production on federal lands and closed off areas of exploration and development of offshore oil. The Obama administration’s draft five year plan for 2011-2022 lists 54 lease sales — the lowest number in the Kuyvaske history of the planning process. Currently, the administration’s five-year offshore oil and gas leasing plan, which took effect on August 27, 2012, removes 1.42 billion acres of the 1.65 billion acres of available OCS lands — 87 percent — off limits to any new oil and gas exploration off the Atlantic coast.

Bottom line, if American oil is exported, the demand for Iranian oil will decrease. This will result in less GHG emissions, more income for American workers, an increase in the U.S. GDP and a focus on American priorities. If American oil is not exported, these benefits will be seen by Iran.
If Obama really believes that no challenge poses a greater threat to future generations than climate change, and if he is willing to acknowledge that most Americans feel that terrorism poses at least an equally serious threat, he should support exploring for and exporting American oil.

Cassidy is Louisiana’s junior senator, serving since 2015. He sits on the Appropriations; the Energy and Natural Resources; the Health, Education, Labor and Pensions; and the Veterans’ Affairs committees.
Senator Cassidy. In the article we point out, for example, and I suspect Dr. Vakhshouri could testify to this, that the Iranian oil fields emit about three times the CO2 equivalence as U.S. Gulf of Mexico equivalence. And if they bring up their—we put $2 million if Iran brings up their daily output by two million more barrels a day and they will emit 100,000 more, 100,000 more, metric tons of CO2 equivalence per day, 36.5 million metric tons of CO2 equivalence per year than the U.S. does from our Gulf of Mexico. So if one of the concerns of our colleagues on the other side is CO2 emissions it actually lowers global CO2 emissions by exporting U.S. oil.

Let me credit my colleagues in the back, Ms. Genevieve Gorman and Mr. Jack Crampton, for their help in researching this editorial.

That said, Mr. Crane, in your testimony you state that one thing we could do to help shut down is although ISIS is awash in cash they do do business with large enterprises and at some point may attempt to move that cash into banks, if they have not already done so. You say Treasury could go after these entities as a way to increase transaction cost. Why aren't we already? [Laughter.]

I am sitting here thinking we should have done this a year ago. Have we attempted and been unsuccessful or has it been a pathway which we have not pursued?

Dr. Crane. My understanding is that they don't use banks much. The question really is there are a number, as you know, heavy trucks, Class A vehicles, are expensive costs, over $100,000 a year. Some of them are operated by fleet operators.

What I think would be useful is make sure that we have intelligence about which companies, some of which are located in surrounding countries or in Syria, are operating those vehicles and you can then go after those. A lot of the trucks are operated by owner operators that are sanctioned——

Senator Cassidy. But you mentioned specifically some large companies that they must deal with.

Dr. Crane. Right.

Senator Cassidy. I am sensing that you have a sense of which large companies those are. Have we gone after those large companies?

Dr. Crane. There are some in the KRI, in Kurdish Regional Government area, that have been accused of doing this. I do not know if we have actionable intelligence.

Senator Cassidy. Gotcha.

Mr. Webster, you emphasize that the U.S. shale production has contributed not only to U.S. but also global national security. It would do more so if we allowed oil exports.

I am struck that we just assume that that fracking industry can rise and fall effortlessly, but from the field I am hearing that because prices have remained low so long that now that production capacity is not only being idled but the workers dispersed, that we cannot necessarily ramp up within a week this fracking capacity but rather be reassembled over a period of time. And the longer we go with it being disassembled and dispersed, the longer it would take to do so. Is that a correct assessment?

Mr. Webster. Thank you, Senator, for that question.

Actually that is correct. The longer that the fields that you, kind of, move out and lay off the crudes, of course the longer it takes
to reassemble them, both in terms of the kit that is required but also in terms of the personnel. So while you can bring production back up when there are market signals, the longer that they are not, you know, kind of, at the high level of investment, the longer it does take.

Senator Cassidy. So the more we dilly dally the more we run a risk of not being able to reassemble quickly thereby hurting both national and global security?

Mr. Webster. The longer that the price is low and that you are not moving, absolutely.

Senator Cassidy. Yes, gotcha.

Dr. Vakhshouri, I apologize if I am not getting your name correctly. The Carnegie Institute for International Peace does point out that Iranian oil production emits three times the CO2 equivalence as U.S. oil production but you mention that they would like to move to refinery capacity. Have the Iranians ever shown in the refinery business any particular concern for CO2 emissions?

Dr. Vakhshouri. Well of course, I mean, I think, Senator, first thanks for your question. I can't compare the efficiency and the emissions and the facilities in Iran and the United States but yes, there are going to be, of course, more emissions, producing more emission than those in the United States.

But I would like to mention something and that is about Iran's export or Iran's crude oil. That is a different type of crude oil in Iran and different markets and different types of refineries that are refining Iran's condensate.

Senator Cassidy. Dr. Vakhshouri, I am sorry I am out of time and I have one more statement to make. So can I ask you to hold that and submit that answer for the record? I apologize.

Dr. Vakhshouri. Sure, just one more point. The additional refinery capacity would be for Iran's condensate.

Senator Cassidy. Yes.

Dr. Vakhshouri. And condensate refiner would not be as——

Senator Cassidy. Emittive.

Dr. Vakhshouri. Yes.

Senator Cassidy. Let me just finish by saying this, Madam Chair.

We heard from Secretary, from Ms. Yellen, the other day that a decrease in U.S. oil production is now a drag on the economy. We hear from the Aspen Institute that if we allow export of oil it creates 630,000 jobs per year and increases GDP by $141 billion. We hear from Mr. Webster that by exporting oil we will increase both national and global security. But if we do not tend to it we will lose that opportunity both on an economic, a national security and I might add, environmental basis. There is such a strong case for allowing U.S. export of oil. I cannot imagine why the Administration does not.

I yield back. Thank you.

The Chairman. Well said, Senator Cassidy.

Senator Hirono.

Senator Hirono. Thank you, Madam Chair.

I was curious as to, one of the things we understand is that ISIL derives a lot of its revenues from taxation. And Dr. Crane, you mentioned that Iraq stopping its payments to persons who live in
ISIL-controlled territory was a really good thing. But what happens to those people? What income do they rely upon to live their lives? Is there any concern that stopping these, what amounts to massive amounts of payments, what happens to these people and where they might turn?

Dr. Crane. Very good question and that is why the Iraqi Government has been so hesitant to turn on and turn off those payments. What we're seeing though is that mass—people who leave ISIL-control territory, as you know, the Turkmens, the Yazidis, Iraqi Christians, Iraqi Sunnis, have all been persecuted and attacked by ISIL. And so ISIL is trying to keep people there. But what is happening is we're seeing people leave once they, if you're an Iraqi teacher or civil servant or doctor and you leave Mosul and get into, go to Baghdad or Kurdish regional government-controlled territory then your salary will be restored. It's not clear how much of their salaries they even got to keep. You know, ISIL is not a charitable institution.

Senator Hirono. Yes, so it just leads to further instability in Syria and other areas.

Mr. Harrell, right now the position the Under Secretary of Terrorism and Financial Crimes in the Department, our Treasury Department, is vacant. You had talked about targeting cash houses, exchange houses, going after some of the financial institutions that support ISIL, so this position is vacant and this is a person who leads the effort of our country to counter terrorist financing. So how important is it for us to fill this position at this point?

Mr. Harrell. Thank you very much, Senator, for that question. I worked closely with the Administration's nominee for that position, Adam Szubin, when I was working at the State Department. He is certainly an incredibly effective individual at combating the financing of terrorism, and I think it would be very valuable for the Treasury Department to have him confirmed.

He is obviously working diligently every day, but as you know, Senator, there's a difference between working in an acting capacity over there and actually being confirmed and in full authority. And so I certainly think when you're looking at what Treasury can do to combat the financing of ISIL, having their entire team in place.

Senator Hirono. Yes.

Mr. Harrell. Including the Under Secretary, would be valuable.

Senator Hirono. So does anyone on the panel disagree that we should go ahead with this confirmation at this point? Nobody disagrees? Thank you.

Another question for you, Mr. Harrell. You noted in your testimony that there is a flow of oil-related equipment that supports ISIL's revenue stream from oil and that we should target this flow of oil-related equipment. Do you have any thoughts on how the U.S. could best do that?

Mr. Harrell. Thank you.

Senator Hirono. For example, do we know who is supplying all this oil-related equipment and what we can do to stop them from continuing to sell this equipment to ISIL?

Mr. Harrell. Thank you, Senator.

So I think the answer to the second question is the information is obviously imperfect. And gathering additional information so
that the Treasury Department can sanction these supply networks is valuable.

I also think, short of sanctions, there are a couple of steps that can be taken. For example, reaching out to businesses, both the governments in the region and also to traders in the region to make them aware of this problem and of the potential sanction consequences if they do sell equipment to ISIL.

You know the regions are awash in that some people are going to be selling deliberately, some people are just going to be selling to any buyer who comes across their door and making sure that, you know, the businessmen who are selling this stuff are taking steps.

Will that be a complete solution? No. Would it be helpful? Yes. I also think it would be valuable instead of having the sanctions focused on sales to ISIS which can be hard to show. You have to really document this is ISIS. Sales across the borders into ISIS-controlled territory and prohibiting it at a territorial level would be an easier enforcement issue.

Senator HIRONO. I am running out of time.

But what countries are the most likely suppliers of this type of equipment that the U.S. could engage in discussions with to have them cease selling these items?

Mr. HARRELL. Iraq and Turkey. I mean both those countries are awash in oil equipment, and I'd recommend engagement there.

Senator HIRONO. Thank you.

The CHAIRMAN. Senator Gardner.

Senator GARDNER. Thank you, Madam Chair.

It is good to see the other Senator Murkowski on this side of the dais, so welcome to the Committee, Senator Murkowski. And thank you, Chairman Murkowski, for this hearing today and Ranking Member Cantwell as well. To the witnesses, thank you for your time today.

The first question, I will direct to Mr. Webster. Earlier this week we heard testimony from Amos Hochstein, who is the nominee to be the Assistant Secretary for Energy at the Department of State, talking about the impact of the sanctions we had in place against Iran and how those sanctions had cost the Iranian regime $150 billion because of lost oil revenues. How long will it take for Iran to recoup $150 billion in lost Iran revenues once sanctions are lifted?

Mr. WEBSTER. Senator, I generally look at volumes and not dollars, so I would say probably Ms. Vakhshouri would probably be a bit better equipped to answer that particular question.

Senator GARDNER. Dr. Vakhshouri, would you take a crack at that?

Dr. VAKHSOURI. Senator, the volume of their export has dropped severely on the numbers because some of their assets—they don't, at this current moment, they don't have access to their funds outside of, they're outside of Iran, but on the numbers I cannot give a statement.

But on the portions, their export and their revenue dropped significantly, even in their budget, because prior to 2011 Iran's oil export income was 80 percent of its export revenue and 60 percent of its government revenue. But even the share of the budget, oil revenue in their budget, dropped from 70 percent to 33 percent.
Senator GARDNER. But it is pretty safe to say that a $150 billion loss in revenue will be recouped by additional sales once the sanctions are lifted, correct? They will be making money.

Dr. VAKHSHOURI. Well, they make money, of course——

Senator GARDNER. Correct. Will some of that money be used for funding of terrorism?

Dr. VAKHSHOURI. Well Senator, I mean, I'm not an expert in terrorism, but I look into the industry and I think that after 2012 sanctions the influence of the groups that in the U.S. we consider as supporters for terrorism increased in Iran because they think we had better access to the network to help the economy.

Senator GARDNER. Mr. Harrell, Dr. Crane, would any of you like to add to that, the increase in sales from Iranian oil that will be allowed once the sanctions are lifted that money will go toward state sponsored terrorism, correct? At least some of that money?

Dr. CRANE. Some of the money will go to the Syrian regime.

Senator GARDNER. Which is killing its own people.

Dr. CRANE. Right. I think the bigger issue, but I can't imagine that they're going to, at current oil prices, they'll recoup $150 billion any time in the next few decades.

Senator GARDNER. Okay. But if they are making money some of that will go to state-sponsored terrorism.

Mr. Harrell, would you like to comment on that?

Mr. HARRELL. Thank you, Senator.

I should begin by saying I know that low oil prices have been hard for some of the energy producing parts of the country, but it's been very good for national security in the sense of depriving revenues to countries like Iran, like Russia, that depend on oil revenues for——

Senator GARDNER. Let me jump in right there. For the U.S. to change its export policy, that would actually improve U.S. national security?

Mr. HARRELL. I'd have to defer to some of the other experts on the panel for the domestic ramifications of that.

Senator GARDNER. But I think you just said that depriving Iran the revenue has helped our national security, correct?

Mr. HARRELL. But, clearly, yes.

Senator GARDNER. Their displacing their exports by U.S. exports would also help our national security, correct?

Mr. HARRELL. Clearly low oil prices help our national security. I think there are strong national security arguments for allowing U.S. exports as part of a balanced package that also addresses a variety of environmental issues. Again, I'm not the expert on the domestic side of this, so can't comment——

Senator GARDNER. Mr. Webster, let me jump to you. Does allowing export of oil from the United States improve our national security?

Mr. WEBSTER. Absolutely, Senator.

Senator GARDNER. Thank you.

I want to just talk about some of the visits that we have had over the past year with leaders from Japan, leaders in Korea, all talking about U.S. exports. However, they have also said in various countries, we have heard of teams that have been traveling from Japan, for instance, to Iran to talk about additional energy opportunities
there. Do you anticipate some of our closest allies entering into export agreements with Iran?

Mr. Webster. But right now, thank you, Senator, for that question.

I know that Iran right now is trying to get its terms together so that it can entice some of these companies to come back. I think it might take a bit of time to do that. But I do think Iran does represent a lot of opportunities for these companies and countries outside of the United States, and I have no question that there will be absolute interest by those.

Senator Gardner. Thank you.

I want to ask one final question. Several of us have requested that the President increase the deployment and embedding of joint terminal attack controllers, JTACs, to help find and identify targets on the ground. Would that be useful in targeting oil production, oil development, oil transportation in Syria by ISIS? I would love to hear anybody’s response who is willing to answer the question.

Dr. Crane, we will start with you.

Dr. Crane. This is kind of personal. I was in Iraq for three months in 2003 and five people that I knew were killed. And so every time, my daughter works with Navy Seals, so every time we deploy U.S. troops I recognize there is cost with that as well. It would probably improve targeting.

Senator Gardner. Mr. Harrell.

Mr. Harrell. I’d just echo Dr. Crane’s comment. These are obviously complex decisions but clearly gathering more intelligence helps improve targeting.


Thank you, Madam Chair, my time has expired.

The Chairman. Thank you, Senator Gardner.

Senator Barrasso.

Senator Barrasso. Thank you very much, Madam Chairman.

Mr. Harrell, I found your testimony fascinating, and I read every word of it. Now in your testimony you state, “we have to acknowledge that U.S. and coalition efforts to date have, at most, limited success in actually reducing ISIS oil revenues.” You went on to explain the current estimates of a million dollars to a million and a half dollars a day are largely unchanged from an estimated million a day that the Treasury Under Secretary estimated ISIS earned from the oil trade about a year ago in November 2014. Finally you say one of the lessons of the last year is that limited strikes on ISIS oil infrastructure are not strategically effective.

You served in the Obama Administration between 2009–2014, and you worked on President Obama’s 2008 campaign. Can you give us any insight into why the President has decided not to change his strategy against ISIS in light of these and other failures?

Mr. Harrell. Thank you, Senator, for the question.

I should begin by saying I do actually think that the significantly increased operational tempo and range of targets that we’ve seen DOD begin striking over the last three or four weeks is a very important step. It appears to be having an impact although the, you know, results are early and it’s hard to gather information from the
ground. But I think that that is a very important step. And I certainly hope that we see continued escalation of the targeting of this oil infrastructure.

Senator Barrasso. So for the first year or so we don’t have what we have now seen in the last three or four weeks. So you actually commended the recent air strikes in your testimony on the oil tanker trucks that distribute oil that is produced in the ISIS-controlled territory. You commend the military’s recent decision to strike, as you said, larger pieces of ISIS oil infrastructure that are more difficult to repair or replace because you went through a lot about how easy it was to repair a number of the things that we were shooting at before. You state more needs to be done. You explain that strikes on oil infrastructure need to be comprehensive not limited, and you say that the U.S. military should target ISIS’ oil infrastructure to the maximum extent possible and there should be no part of ISIS oil enterprise where people feel safe to work.

As a former official in the Obama Administration do you believe the Administration, today, is prepared to actually take those additional steps that you have outlined?

Mr. Harrell. I certainly think that what I have, what we have, seen all of us have seen over the last month is a very welcome increase in operational tempo.

I would say, obviously, it does take time to develop targeting packages. I do think that the raid on Abu Sayyaf, the ISIS oil minister, essentially, in May provided a variety of important information that’s been useful for targeting. It no doubt took time to decode, translate all that information and use it. And certainly where we are today is a welcome tempo, and I hope it continues.

Senator Barrasso. Along those lines you had mentioned that government officials have concerns about avoiding permanent damage, you said, to Syrian oil infrastructure given that oil will be a key piece of rebuilding of post conflict Syria. I wonder to what extent officials within the Obama Administration continue to have these concerns.

Mr. Harrell. Senator, thank you very much.

I obviously can’t speak to the current thinking of the Obama Administration. I do think that while there are legitimate concerns, you always want to weigh collateral costs. Where we are today, in my view, the threat we’re facing is such the weight of destroying the infrastructure needs to weigh very heavily on the scales.

Senator Barrasso. So you would agree that it is more important to first defeat ISIS and then worry about the details of rebuilding Syria.

Mr. Harrell. I think clearly ISIS is the most serious terrorist threat we face today, and we need to take all practical steps to defeat them.

Senator Barrasso. You also talk a bit about beyond oil, the natural gas business in Syria, explaining that over the last year ISIS captured important Syrian natural gas fields. You say, multiple sources indicate that ISIS sells natural gas to the Assad regime largely to fuel electricity production. Finally you say that you have heard from U.S. Government sources that the natural gas trade between ISIS and the Assad regime is at this point significantly larg-
er than the oil trade between them. Do you know how much ISIS earns from producing and selling their natural gas?

Mr. Harrell. I unfortunately don’t have a good estimate or break down for that specific number. The information, I think, I and probably other experts have gotten on that front has been anecdotal. I don’t know if my colleague, Dr. Crane, would like to comment on that.

Senator Barrasso. Dr. Crane, would you like to weigh in?

Dr. Crane. Yeah. It’s a complicated question because what has happened is that they ship the natural gas to a generator and then ISIL is paid in the form of electricity, so a dollar amount is not very useful but it does help ISIL to have access to electric power.

Senator Barrasso. I guess then my final question, Madam Chairman, is to Mr. Harrell, as well as Dr. Crane if he wants to jump in. Do you believe it is easier or more difficult to cutoff this, in terms of natural gas verses oil? Do you have any thoughts on it because obviously the revenue is different but still there is a price being paid?

Dr. Crane. On natural gas, as you well know, it would be the generating plant that it goes to. It would be difficult to target the pipeline, per se, because it’s hard to hit.

Whether the United States Government would want to target an electric power plant in Syria is above my pay grade, but it’s a pretty serious question. It does have a lot of implications for the horrible situation in Syria.

And as we mention on the oil side, I think we will decrease revenues but it’s not going to go away. There’s, you know, you can haul it in pickup trucks, fix terminals and things like that. It’s helpful but it’s, it doesn’t make it disappear.

Senator Barrasso. Thank you.

Senator Capito. Thank you, Madam Chairman and thank you all. This has been very interesting discussion.

I want to pivot a little bit to Saudi Arabia. Saudi Arabia has continued to ramp up their production even as the price of oil has gone down, and I think they are experiencing a bit of a fiscal crisis over their lack of revenues.

I have a report here. I think the data is from the IMF and it says that in order for Saudi Arabia to balance their budget in 2015 the price of oil would have to be $106. It is obviously much, much less than that. Of course they have a lot of reserves, and they are, I am sure, drawing on them as we speak.

I would like to ask in light of that and if we do and I do support oil exports from this country and oil glut, do you anticipate that this will bring about in a country such as Saudi Arabia an instability that could make those countries even more vulnerable to ISIS or somebody or a terrorist group to be able to come in, and I do not want to say take over, but become a part of that? Is that a fear or is that something that is possible? Dr. Crane, do you have an opinion on that?

Dr. Crane. Saudi Arabia has very substantial reserves as you know and they can run a deficit for a very long period of time.
I think more importantly when I’ve worked both in Iraq and I’ve worked quite a bit in Qatar as well, there’s a tremendous amount of waste in government expenditures there that we’re all aware of in terms of almost free electricity, very low prices for gasoline or whatever. And when we’ve seen, when the Iraqis finally did raise gasoline prices up from a nickel a gallon up to something sensible, there wasn’t a peep from the population.

So I think what we’ve seen in even regimes that are autocratic like in Saudi Arabia that when governments make these cuts in very wasteful subsidies and there’s a lot of wasteful investment as you know, in Saudi Arabia. They’ve been able to weather the storm.

Senator Capito. And should be able to for quite some time.

Mr. Webster, we have talked a lot about who is using the revenues and how the revenues are used. Can we boil it down simplistically to say this percent of the oil that is captured by ISIS is used internally? Is it 50 percent? Is it 70 percent? And what percent is sold externally? Do you have an idea of those numbers?

Mr. Webster. Thank you for your question, Senator.

I’m not sure I’m going to be able to answer it. Our assessment is close to a couple of my colleagues here from the IHS country risk which is about 45 percent of their revenues come from oil but in terms of its distribution rather if it’s within the ISIS territory or if it is exported or put out elsewhere I’m afraid I don’t have that.

Senator Capito. Does anybody have an opinion or an approximation? What I am trying to get at is if 50 percent of the oil revenues—we have talked about how to stem the tide here and a lot of it is the financial sanctions, but you say they do not go through the banks. They are not using a formalized financial system, but if they are selling this to countries there is some way, to track the old movie line, to follow the money.

That is the question I am trying to get to is where do we look for this money where we can find a formalized financial system that we can then impose as a global community, I would think, financial sanctions.

Dr. Crane. Unfortunately what we’ve had is that the single largest set of buyers for the oil have been these small teapot refineries. And then once it goes into gasoline and diesel——

Senator Capito. Can’t trace it.

Dr. Crane. It goes everywhere, and it’s gone all over the place. The largest single sales have been to the Syrian Government, these 20,000 odd barrels per day. We don’t have a lot of influence with that government.

Senator Capito. Right.

Dr. Crane. But that’s the sad truth.

I do think, however, targeting, you know, classic vehicles, heavy trucks are expensive. And so when one targets those then the people who own those think two, three, four times before they engage in hauling this stuff around and it doesn’t move by itself.

Senator Capito. Alright. Thank you.

The Chairman. Senator Hoeven.

Senator Hoeven. Thank you, Madam Chairman.

I would like to thank both you and the Ranking Member for holding this hearing.
I believe that lifting the oil export ban is important for our country and will help with national security through energy security by helping to grow our oil and gas industry, our energy industry in this country. We create a stronger economy, we create more jobs, but we also produce more energy here at home and are able to supply our allies with oil and gas as well. So I would like each of you to react. Do you agree with that generally and if not, why not?

We will start with Dr. Crane.

Dr. CRANE. Yes, as an economist putting strictures on markets is have efficiency costs.

Senator HOEVEN. Mr. Harrell.

Mr. HARRELL. Thank you very much.

I certainly think from a national security perspective there's strong arguments for allowing U.S. oil exports. I can't speak to domestic side of that equation.

Dr. VAKHSHOURI. I think it's important for the global energy security particularly in considering the investment in non-OPEC oil is reducing and the share of the OPEC oil export is going to increase from 50 percent today to 75 percent in the next decade. So it is important to have, especially the Middle East tackling with all these terrorist attacks and threats, it's important to have the alternative resources out, especially from the U.S.

Senator HOEVEN. Mr. Webster.

Mr. WEBSTER. Thanks for your question, Senator.

As you are probably aware, IHS has put out a couple of studies on the crude export issue. Our findings is that this is a clear win for the U.S. economy and also for energy security. It's difficult to find a case where it's, this is not a positive.

Senator HOEVEN. Thank you.

Dr. Vakhshouri, when the United States put the restrictions in place, the sanctions in place on Iran at that time, I believe, Iran was exporting about two and a half million barrels a day. After those sanctions had gone into place, I believe, their exports declined to just barely over one million barrels a day.

With the President’s plan to lift sanctions, can you tell us what you anticipate in terms of exports, growing volume of exports, for Iran and kind of a timeline as you see them grow?

Dr. VAKHSHOURI. Thank you very much for your question, Senator.

On the immediate rebound of Iran and crude oil, depending on the timeline of the sanction roll back, Iran can add about 400,000 to 500,000 barrels per day by mid next year and about 150,000 to 200,000 barrels per day of condensate.

Iran's midterm plans for increasing its crude oil and condensate is to ramp up its crude oil capacity of pre 2012 of four million barrels per day to about 5.7 million barrels per day which out of this 5.7 million barrels per day, one million of it would be condensate.

So on the crude oil side, really the capacity of Iran's production by the end of 2020 would be about 4.7 million barrels per day. And they have already done the investment, so they will be able to reach to this production capacity by 2020. Seven hundred thousands barrels per day of it would be new oil, from new fields and the rest would be the natural oil, old fields.
Senator Hoeven. So you are saying they already have the capital to make the investment to achieve that growth and by 2020 they would export the equivalent of four million barrels a day?

Dr. Vakhshouri. Produce.

Senator Hoeven. Produce. How much of that would they export?

Dr. Vakhshouri. So the export, Iran’s main plan is to regain its prior, pre-2012 sanctions level of 2.5, so and then their OPEC position. So that would be their main priority.

Out of this 5.7, one million of it would condensate that their refinery capacity for condensate will increase to one million barrels per day by 2020. So no more than Iran’s total overall export is not going to increase in the best scenario more than 500, if everything goes well.

On the investment side it’s expected that Iran’s total upstream and downstream in petrochemical energy needs about $200 billion to $250 billion of investment. But for increasing its, to reaching its medium term crude oil and natural gas production by 2020 they only need about $50 billion investment——

Senator Hoeven. Do you anticipate them going back to the roughly two and a half million barrels a day of export by the 2020 timeline?

Dr. Vakhshouri. My anticipation, Iran’s oil minister’s anticipation is sometime by the end of 2016 but our anticipation is that by that, it takes some time, so maximum production increased from Iran would be about 500,000 barrels of crude oil and about 200 condensate. It would take another year for Iran to build that capacity because they have to shut down some of the fields. And to regain that back, that production capacity, also considering that Iran’s oil fields are mature, it’s going to take some time.

Senator Hoeven. Okay.

Why do you think Saudi Arabia is pushing volumes so aggressively in terms of oil production and export? Why is Saudi Arabia doing that?

Dr. Vakhshouri. Well I think for different reasons.

First and foremost is that Saudi, by reducing their prices the demand, hopefully, would raise and the United States demand, gasoline market, would be also important for Saudis. But we see that how the transportation system were moved from the fossil fuels to other renewable sources of energy, also the expansion of U.S. crude oil production and generally non OPEC production.

On the other side I don’t see why Saudis, they don’t see any reason to give back the market access to Iran, the market to Iran. So Saudi and Kuwait already are substituting Iranian oil production drop of sanctions, since 2012 sanctions, and I don’t see any reason for Saudis politically and also market wise to lose this market access.

And something that is important is that how OPEC is functional in the next year, in the next decade or next few years. Just the way that we see that Iraq is signing the contracts and its upstream energy industry and Iranian oil, new oil investment regulations, would allow the companies to increase more production because the prices are so low they have to increase their production to make their money back. So it’s going to be very tough to keep that balance between the OPEC members.
Senator Hoeven. Madam Chair, I have one more question. Do you want me to wait or can I ask it? I see I am over my time, so I will defer to——

The Chairman. Let’s go to Senator Lee.

Senator Hoeven. Alright.

The Chairman. You will have an opportunity for a second round.

Senator Hoeven. Very good. Thank you.

Senator Lee. Thank you, Madam Chair, thanks to all of you for being here today.

Mr. Harrell, I would like to start with you, if that is alright. In your testimony you point out that the U.S. and our coalition allies have had some limited success in reducing the oil revenues that ISIS has been able to get which remain at about $1 million to $1.5 million per day, as I understand it. Can you tell me why is it that current policies have failed to affect what we regard as ISIS’ second largest source of revenue?

Mr. Harrell. Thank you very much, Senator, for the question. I should begin by saying I do think that the, sort of, recently increased tempo of military strikes over the last month or so is having an impact and is an important move in strategic direction of how to attack this.

I think that the fundamental challenge the U.S. faces there is because this oil is largely produced in, you know, small kinds of wells and then distributed pretty widely and largely consumed in ISIS’ own territory or sold to the Assad regime. It is really a military decision, a military set of tools, that is first and most important. Sanctions can be an important supporting set of tools, but it is a military set of tools that has got to be front and center here.

And I think that, you know, it probably took the Administration some time to decipher the intelligence to figure out that the, where the assets to strike are, about what kinds of assets are available to strike those targets to get to where we are today where there’s an increased military tempo.

I do hope that the increased military tempo we are seeing will be contained and indeed escalated going forward because I do think that’s front and center, the best way to target this source of revenue.

Senator Lee. So increased military involvement certainly would help when we are targeting, when we are going after, ISIS targets.

What about the policing against ISIS’ black market activities as conducted by neighboring Arab states? Do you think that is likely to help also with regard to our efforts to hinder ISIS oil production?

Mr. Harrell. I absolutely think that is also a very useful step. Saying that most of the oil is consumed in ISIS territory or sold to Assad doesn’t mean all of it. There is clearly some smuggling happening. And I think that getting the adjacent states to actually seize and destroy the vehicles that are being used for smuggling the oil that’s coming out, not just turn it back so it can try to cross again, but actually take these, take this equipment out of commission would be a very important step.

I also think intelligence gaps are definitely real. I’ve worked on this from a government side. I understand how hard it is to get intelligence. But, you know, taking sanctions against the guys while
ultimately buying it in Turkey, in KRG, where you can identify who those people are, is also a useful step to take.

Senator Lee. Which of the Arab states in the region do you think are best positioned to help us with these efforts, help contribute to the increased military action against ISIS?

Mr. Harrell. Well in terms of the oil smuggling out of ISIS territory, so shutting that down, I think it’s pretty clear most of it has been, well most of it is in the Assad regime which isn’t going to help us. But after that it’s pretty clear most of it has been going into Turkey and into the Kurdish autonomous region of Iraq.

I do think the KRG, the regional government there, has been escalating its tempo to crack down on that, as have the Turks, but I do think more can be done there in terms of stopping the smuggling.

Senator Lee. Most of the oil sold by ISIS has been intra-territorial within ISIS-held territory. What do you think the likelihood is that this will expand, that they will increase their production of oil and that we will see a corresponding increase in the amount of oil that they are exporting? And who, if anyone, do you see as the most likely buyers in their exports?

Mr. Harrell. Well, Senator, thank you very much for the question.

I certainly hope we will not see an increase in production, because I hope we keep the military pressure on them. I think that’s a very valuable step to take.

Clearly absent effective pressure, including the military pressure on the production, we would see an increase. I mean, they know this is a major source of revenue for them. It is something that they are interested in maintaining. You see that they repair facilities when they can very quickly after strikes. It’s important to them, so clearly we’ve got to keep up the pressure or it will increase. I mean, the smuggling routes into Turkey and into KRG and elsewhere, these are long standing smuggling routes that have existed for years and years and years.

Senator Lee. Long before ISIS.

Mr. Harrell. Yes, long before ISIS. I mean that’s where things flow out.

Senator Lee. So that’s where we would most likely to see the most action there?

Mr. Harrell. Yes.

Senator Lee. I see my time has expired. Thank you, Madam Chair.

The Chairman. Thank you, Senator Lee.

I have another set of questions here, but I will defer my time and go back to you Senator Hoeven.

Senator Hoeven. Thank you, Madam Chairman. I appreciate that.

I just wanted to finish up for a minute with Dr. Vakhshouri about how dependent Iran’s economy is on oil. In other words, if they could not export oil, just how much difficulty would that create for them? What percent of their economy is oil and what would the ramifications be on the regime and on their economy in general if they were not able to export oil?

Dr. Vakhshouri. Thank you for your question, Senator.
Well as I mentioned earlier, Iran’s dependency on oil export revenue decreased significantly since 2012. One issue was because of simply the restrictions on their oil export and that their oil export almost dropped to half. The other one was the very low crude oil prices.

So already Iran, compared to other producers of OPEC and among the Persian Gulf producers, Iran has the less dependency on oil export. And I mentioned that the share of oil export revenue in Iran’s domestic budget dropped from 70 percent in 2011 to 33 percent in 2015.

And what Iran is thinking now is just instead of exporting crude oil or natural gas, of course, export of natural gas is important for Iran because it creates long-term energy ties with its, with the receiving countries but to produce more processed products like refined petroleum products, refined products that come from their condensate, lighter and middle distillates. And also using their natural gas in their petrochemical factories, they’re going to increase their petrochemical facilities and production capacity almost three times by 2025 and also export of electricity.

And it would, of course, generate more income, more jobs for the government and also it’s harder to put a ban on export of electricity at some point than export of crude oil or natural gas. It’s harder for governments that are receiving electricity politically to be convinced to stop importing electricity.

Senator HOEVEN. But all of that economic activity you describe is dependent on oil and gas.

Dr. VAKHSHOURI. I mean Iran has lots of mining industry and lots of other sources of income like taxing, taxations which have been increased in the recent years to substitute some of their oil revenue. But of course, it comes from oil and gas. But they’re going to process it inside and then——

Senator HOEVEN. I understand.

Dr. VAKHSHOURI. Yes.

Senator HOEVEN. Thank you. And thank you, Madam Chairman.

The CHAIRMAN. Senator Cantwell.

Senator CANTWELL. Thank you, Madam Chairman.

I would like to keep with the subject but ask the question a little differently and with respect to lifting the sanctions with Iran. I would like to know how lifting sanctions affects its energy sector, how it affects the conservative Iranian Revolutionary Guard Corporation (IRGC) and how diversifying businesses might be impacted? So either Mr. Harrell or Dr. Crane, what impacts would this opening up have on diversifying power and influence, at least in the energy sector?

Dr. CRANE. As you know, Iran is a, you know, 80 million population. That’s a pretty wide—it has a bunch more diverse economy than a country like Qatar. And what we’ve seen happen over the course of the sanctions is that the foundation is called Bazaaris which are owned by the Iranian Revolution or controlled by the Iranian Revolutionary Guards, have kind of, crept into the economy and established monopolies and siphoned off, use those profits to fund their own activities.
And Iran has a long history of being very competitive and capitalistic. I mean, it's had markets. The Bazaaris are focused on Bazaaris.

And I think in the internal, you know, the internal political dynamic in Iran who we have seen individuals who are much more interested in integrating with the rest of the world economy are seeing the relaxation of sanctions as weakening those groups that have been opposed to, you know, have been using the sanctions to strengthen our own position. And these groups are the people who are financing terrorists and engaged in other activities abroad.

Senator CANTWELL. Mr. Harrell.

Mr. HARRELL. Thank you very much for the question, Senator.

I just largely echo Dr. Crane's remarks and view of how the IRGC did increase its influence during the sanctions era.

I think that the fact the IRGC maintained, remained sanctioned, even after the nuclear deal and the fact that, I think, there's commitment both here in Washington and in Europe to really keep up the pressure on the IRGC to make sure the companies going into Iran do not do business with the IRGC has some potential to help some of the non-IRGC actors in Iran, you know, compete more effectively against the IRGC in these economic areas where the IRGC is active.

Senator CANTWELL. In energy?

Mr. HARRELL. Yeah.

Senator CANTWELL. Wouldn't that be a good thing if we had somebody competing with them?

Mr. HARRELL. I certainly think we want to see more competition emerge to the IRGC. I mean, the sanctions were very effective, I think, at getting us to where we are today with the nuclear agreement. But you know, we did see the IRGC expand its role in a diminishing pie in Iran during the sanctions era. And I think it would be good to see some of that get unwound and see the IRGC, obviously, lose its influence within Iran.

Senator CANTWELL. Thank you. Thank you, Madam Chair.

The CHAIRMAN. Thank you, Senator Cantwell.

Mr. Webster, I want to wrap up my questions with one directed to you. In your testimony you talked about the issue of spare capacity that is out there and recognizing that this cushion that has been available historically through OPEC countries, we have seen a decline in that spare capacity and as we continue to see production up at higher levels that that spare capacity or that cushion is lessened.

Your comment about the risk premium or the fear premium, well obviously there is a lot of risk going on whether we are talking about Iraq, Iran, Syria, Saudi Arabia or anywhere in the region. We have had some discussion in this Committee about what we really know about the spare capacity. We do a lot of guessing, I think, particularly when it comes to nation countries like Saudi Arabia.

How confident are we that we really have an understanding as to what that cushion is, how reliable that is and what does that do to this risk premium or this fear premium that factors into what is going on with not only accessibility of supply but the pricing?

Mr. WEBSTER. Thank you for your question, Senator Murkowski.
This is a very big issue, and I know you have discussions in terms of figuring out how much spare capacity actually is. We in the analytical community, we don’t have guesses, we call them analysis. But it’s right up there which is the question is it’s a big question for markets.

When you got to this in 2008 there’s always that assessment of, you know, Saudi Arabia has historically claimed it as 12.5 or 12 without the partition neutral zone but in reality you have to make an assumption on how much actually is there and realize that usually the last million barrels a day or so is quite heavy, so it’s actually oil that is actually not terribly useful for oil markets. So it’s both an uncertainty on how much there actually is and how sustainable that is and what type of oil it is.

This shift from Saudi Arabia and spare capacity to more control within the United States system both in terms of shale oil and also in terms of stocks, is incredibly important because it is much more easy for someone like me to calculate just how much we have there.

This fear premium, this is my concern, is that in the coming years, right now we have a lot of geopolitical risk out there, but the market isn’t really paying attention to that right now because we are producing more oil than we are consuming around the world right now. And so you could actually handle an outage right now without a whole lot of difficulty.

But this is going to shift in the future and part of it is because of OPEC and Saudi Arabia’s policy where they’re actually increasing their production. And whatever your assumption is in terms of their total productive capacity, there’s no question it is shrinking.

The CHAIRMAN. Senator Cantwell mentioned this in her first round of questioning which related to some of the choke points of transportation issues that we face. You have the Strait of Hormuz that is sitting out there, really, with a great deal of exposure and vulnerability when it comes to moving this resource.

When we are talking about this risk premium, how do you factor in the geographic reality of being able to safely and freely move these oil exports?

Mr. WEBSTER. Thanks for your question, Senator.

The Strait of Hormuz is, as I would say, probably the most critical choke point for global oil markets. So as Ranking Member Cantwell mentioned in her opening statement, there’s about 94 million barrels of supply or demand every day. About 17 million of that actually flows through the Strait of Hormuz and that, while you have other places like the Strait of Malacca and other places where you could, you know, arguably go around it, you can’t really easily go around the Strait of Hormuz. You need to go through it.

When you get into an environment where it is either a tight market or some sort of concern that something might happen in terms of harassment operations or some effort to try to choke off supply from the Strait of Hormuz, the availability of supply from other parts of the world that is not bottled up within the Gulf is incredibly important for not just U.S. energy security, but also global energy security.

The CHAIRMAN. Well it just seems to me that as we are talking about the very direct connect between oil and funding or financing of terrorism around the world that we can be focusing today on di-
rect hits to small trucks or how we are moving vehicles that are transporting oil on the ground. But that is just what we are focusing on right here, right now.

The reality is that this is a global trade in oil that allows for a funding of terrorism that goes on around the world, and where we have these points of vulnerability as we are moving these resources I think we need to be paying attention and understanding, again, the implications of these restrictions.

We have talked a little bit on the dais here today about the important role the United States can play in allowing us a greater level of energy security when we have access to increased supply that we control, that we are producing, that we are putting out on the market, that we are not only using for ourselves, but really using to help our friends and allies in other parts of the world.

I mentioned my concern about Libya recognizing that Libya's supply of oil out into the market if something happens, if there is continued unrest and violence there, the United States would have an opportunity to perhaps supply to some of those countries that Libya has been providing oil to.

I think that as we talk about the issue of this 40-year-old export ban and, as was pointed out by Senator Daines, recognizing that we are the only country that produces oil that has in place a ban on export, I think it is important that we put into context what it means, not only to our security as a nation, but to the security of nations around the world when we can help influence, not only the supply, but how you can more safely move the necessary resource.

I see that Senator Warren has arrived. We have just concluded our final remarks, but we will give you the courtesy of your five minutes.

Senator WARREN. I very much appreciate that, Madam Chair. I apologize for my absence. We had a bill signing for the new education bill. I appreciate the chance to be here.

You know, one way to weaken ISIS is to cutoff access to its source of funding. My understanding is that ISIS funds its operations in part through the sale of the oil that it seizes, that it extracts, that it refines in the territories that it controls. And some of that money ends up moving through the banking system including through the more than 100 branches of Iraqi and Syrian national banks that are located in territory controlled or contested by ISIS.

Mr. Harrell, can you explain how ISIS and the people who purchase oil from ISIS rely on the international banking system to move their money?

Mr. Harrell. Thank you, Senator, very much for the question.

I should begin by saying, in my assessment most of the oil trade begins very much as a cash-based trade. It's ISIS selling oil at the well heads taking literal cash, you know, U.S. dollars, Iraqis' DNRs, things like that which they then stockpile. I think they actually do keep much of that money in cash. Over time it is a cash-based economy there and heavily cash dependent.

But clearly as the volumes of cash buildup ISIS is and will be looking for ways to move that out whether it's just for, sort of, management purposes, whether it's to move money to affiliates. And I think it's very important to continue to deny them access to
the formal financial system. I think one of the important steps on that front that the U.S. Treasury Department has taken is the U.S. Treasury Department has gotten the Iraqi Central Bank to shut down the access of the Iraqi bank branches inside ISIS territory in Iraq. So they should now be shut off from the formal financial system.

But we are seeing various informal exchange houses, you know, money wallahs, things like that, looking at ways to move money in and out of ISIS territory. So I don’t think it would go direct from ISIS to the formal financial system very much because the banks are shut down. But I do think they’re looking, you know, and they have ways with some of the informal money exchange houses to, you know, first move it out and then try to move it on. And that’s certainly something that is critically important to address.

Senator WARREN. Well, I think you put it in a very important way but make it clear that cash is critical to their operations. Obviously we want to use any tool that we can to try to disrupt the flow of cash and certainly through the banking system but also any other tool we can to disrupt the flow of cash.

That is part of the reason why President Obama nominated Adam Szubin to serve as Treasury Under Secretary for Terrorism and Financial Crimes back in April. The Under Secretary is responsible for combating terrorist financing and he is the U.S. Government’s chief enforcer of our financial sanctions against countries like Iran, Syria and Sudan.

It is an absolutely critical position and one that plays a key role in disrupting ISIS finances, and I think you have partly identified what we have already done there.

Mr. Harrell, can you explain some of the tools that the Office of Terrorism and Financial Crimes has to disrupt the flow of money to ISIS?

Mr. HARRELL. Yes.

I think there are a number of tools that the Treasury Department, under the Office of Terrorism and Financial Crimes leadership, has including sanctioning money houses and banks that may deal with ISIS, with ISIS cash, including putting out short of sanctions, putting out advisories to the financial sector about what typologies to look for, what risks to look for so there’s greater information there including engaging with Iraq, with Turkey, with other governments in the region, including their regulators to make sure that those regulators are taking the steps to keep that money out of their jurisdiction.

Senator WARREN. Thank you.

Despite the importance of attacking the financial foundation of ISIS, the Republican leadership has been holding up Adam Szubin’s nomination for nearly eight months. Mr. Szubin is impecably qualified for this position, even Republicans do not contest that. He has worked at the Treasury Department for over a decade under both Democratic and Republican Administrations.

Mr. Harrell, let’s be really brief because the Chair has already given us extra time here. Do you think Senate confirmation of Mr. Szubin will aid in our fight against ISIS?

Mr. HARRELL. I absolutely think it would aid in our fight against ISIS.
I’ve had the privilege of working with Adam Szubin for a number of years when I was at the State Department and traveling with him. He would be, once confirmed, an enormously effective leader, leading those operations over at the Treasury Department. As we all know being confirmed in the job is different from serving there in an acting capacity.

Senator Warren. Well, thank you very much.

If we are serious about taking down ISIS we need to aggressively target its use of the international financial system to sell oil and to move money around. Congress does not look very serious about this threat when it definitely delays the confirmation of our top counter-terrorism financing official for months for no legitimate reason.

It is long past time to confirm Adam Szubin to be Under Secretary for Terrorism and Financial Crimes.

Thank you, Madam Chair.

The Chairman. Thank you, Senator Warren.

With that, ladies and gentlemen, thank you for the time that you have given us and all the good and helpful information you have shared. We appreciate it.

Thank you.
We stand adjourned.
[Whereupon, at 12:11 p.m. the hearing was adjourned.]
APPENDIX MATERIAL SUBMITTED

(103)
The Role of Oil in ISIL Finances

Addendum

Keith Crane

RAND Office of External Affairs
The subsequent questions and answers found in this document were received from the Committee for additional information following the hearing on December 10, 2015 and were submitted for the record.

Question from Senator Ron Wyden

Question: Mr. Crane, does ISIL seem to have the technical capability needed to sustain their current level of oil production indefinitely? Absent an increase in attacks from the US and our allies, is ISIL capable of maintaining their existing oil infrastructure?

ISIL has not been able to maintain past levels of oil output in Syria. Production in fields currently controlled by ISIL ran 300,000 barrels per day prior to the Syrian civil war. Before the recent attacks on trucks and oil production infrastructure, production levels from these fields were running 30,000 to 40,000 barrels per day. However, production will not completely cease. ISIL has been able to pressure or induce individuals with oil industry expertise to work in these fields. Absent attacks from the United States and our allies, production could very well rise.

Question from Senator Al Franken

Question: In the Senate we talk a great deal about the importance of “energy independence”. While technological advances such as hydraulic fracturing and horizontal drilling have certainly increased our oil production, the U.S. still imports a tremendous amount of crude oil—more than 7 million barrels every day. The number-one source of these imports is from OPEC countries—many of whom don’t have the same geopolitical interests as the United States. Many Senators

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have been pushing for the U.S. to lift the ban on crude oil exports. If we start exporting some of our oil, will the U.S. have to make up the difference by importing more oil from OPEC countries?

First, I would like to trace through the likely effects of repealing the export ban on U.S. production and the distribution of U.S. produced oil. I will then address your question more directly.

What happens if the oil export ban is repealed? A substantial amount of increased production in the United States comes from fields in North Dakota. Currently, some of this oil is refined in the Midwest, but production out of the Bakken now exceeds Midwestern refineries' demand for this oil. Some is transported to the Gulf. This oil is transported by pipeline, barge and rail. Some of this oil goes west by rail to the Pacific Coast and is barged to California refineries, and some is transported by rail to East Coast refineries, which are designed for lighter, sweeter crude oils like those from the Bakken. It goes by rail because there are no pipelines to the east or west coasts. Railroads charge from $5 to $10 per barrel more to transport this oil than pipelines do for comparable distances. Producers have to discount their oil to cover the costs of transporting it, so as to make it competitive with imported oil delivered by tanker.

If the export embargo were to be repealed, much of the oil currently going to the east or west coasts by rail, might go to the Gulf Coast where it would be exported to foreign markets. It would be exported because transportation costs are lower to the Gulf than to the two coasts: there are pipeline connections to the Gulf Coast, oil can be barged down the Mississippi, and distances by rail are less, all leading to lower transportation costs. Because of lower transportation costs, producers have to provide less of a discount to get their oil to market. The reduction in the discount due to the repeal of the export embargo would increase the profitability of Bakken oil, leading to higher production of oil than would otherwise be the case. How much more would be produced, especially at current prices, is a matter of debate, but some more oil would be produced. In the context of the global market, this increased production would exert some downward pressure on global oil prices, but in light of the size of the likely increase in volumes, it probably would not have a major impact on world market prices.

Repealing the export embargo is also like to increase refining efficiency. Because oil cannot be exported, light, sweet oil from Eagle Ford and other Texas fields is sold to refineries along the Gulf. Most of these refineries have been optimized to use heavy crudes, primarily from Venezuela and Mexico. To induce these refineries to purchase light crude from fields in Texas and elsewhere, the light crude has been sold at a discount to world market prices for similar crudes, like Brent. If this crude could be exported, it would not have to be sold at a discount. Gulf refineries would then choose to import heavy, sour crudes, for which they are optimized. The
global refining industry would enjoy efficiency gains as lighter and heavier crudes would be sold to refiners that are optimized to run on those types of crude.

If we start exporting some of our oil, will the U.S. have to make up the difference by importing more oil from OPEC countries? The net amount of crude oil consumed in the United States is driven by U.S. demand, not U.S. production. U.S. refiners already import more oil than necessary to satisfy U.S. demand. They refine these additional imports and export refined products. U.S. exports of refined oil products and natural gas liquids ran 3.82 million barrels per day in 2014, more than half the number of barrels per day of crude oil imported, which was 7.34 million barrels per day.

Assuming that U.S. demand does not change, repealing the export ban could result in increased exports of crude oil (we currently export to Canada), but a decline in exports of refined oil products, or no change in exports of refined oil products, which would imply more imports.

In 2014, Canada was our most important supplier of oil, accounting for 39 percent of total U.S. imports of crude oil. Mexico is also an important supplier. However, OPEC provided 41 percent of gross imports; Saudi Arabia and Venezuela were our most important suppliers from OPEC. If demand for imported oil were to rise because of increased exports of U.S. crude oil, some of the increased demand would likely come from OPEC, especially supplies to U.S. East Coast refineries. Imports from Venezuela, an OPEC member, likely would also rise, as would imports from Canada, not an OPEC member, as both those countries produce heavier oils, and these oils would substitute for some lighter oils from Texas that are currently being refined in Gulf Coast refineries.

How much oil we produce, export, or import is not a fundamental determinant of the health of the U.S. economy. Many countries with healthy economies, for example, Germany and South Korea, import all their oil. Other healthy economies, like Norway and up until recently Canada are important exporters. The key to U.S. energy security does not lie with production. Rather, it relies on well-functioning international oil markets and a resilient domestic economy that can quickly and efficiently respond to the ups and downs of world market oil prices.

Finally, it is true that some OPEC members do not have the same geopolitical interests as the United States. However, the export ban likely has not affected their policies. The oil exports ban has been in place since 1975. Over the past 40 years the political interests of the United States and these OPEC members have not converged. In the case of Venezuela, they have diverged. OPEC members must sell their oil to generate funds for their governments. Regardless of U.S.
actions, they will find buyers. With the export ban, they likely receive a marginally higher price than they would if the ban were to be lifted, but the quantities now banned from export are likely not enough to have a large effect on exporters' overall revenues.
Questions from Senator Ron Wyden

Question 1: Mr. Harrell, as you and Mr. Webster have testified, ISIL makes a substantial amount of money from illicit oil sales, likely over a million dollars a day. While military action is being taken to cripple their ability to produce oil, you say that ISIL has been able to rebuild what’s been destroyed. You also make a recommendation that “(t)he U.S. needs a robust campaign to sanction ISIL procurement networks and reach out to businesses in Iraq, Turkey, and elsewhere in the region to ensure that they are taking appropriate steps to avoid selling oil equipment to ISIL-linked buyers.” What exactly would the components of that campaign be? How would U.S. financial and trade agencies work to stop the sale of oil equipment to ISIL networks?

Answer: Senator Wyden, thank you very much for your question and for the opportunity to testify to the committee.

With respect to military action against ISIS oil targets, it is important to remember that many of ISIS’s facilities are relatively simple, low-tech facilities, for example “refineries” that are jerry-rigged out of large metal barrels and other readily-available equipment. These kinds of facilities can be repaired or replaced relatively easily after a military strike. Several additional military steps can help increase the pressure on ISIS oil revenues, including continuing to strike the tanker trucks that transport oil in ISIS territory, which are more valuable and harder to replace.

On your question regarding sanctions, the U.S. and our allies should sanction any individual or company that sells oil-related equipment, including oil producing and refining equipment and tanker trucks, into ISIS-controlled territory. Most existing sanctions target the sale of equipment to ISIS, but in Iraq and Syria, countries awash in such equipment, it can be difficult to prove that a sale is to ISIS, rather than to some non-ISIS businessman living in ISIS-territory. Sanctions on the sale of such equipment to ISIS controlled territory would be easier to implement and enforce. In addition, the heightened scrutiny that sanctions officials, banks, and companies are already putting on transactions in southern Turkey and other area adjacent to ISIS territory is valuable to prevent trade with ISIS.

Finally, it is important that we not forget the necessity of keeping up economic and financial pressure on the Asad regime. The sad reality is that until there is a change in the Syrian government, the chaos and violence that allowed ISIS to grow in Syria will remain. We should work to tighten the pressure on Asad, including by putting pressure on the military supply lines that Iran and Russia use to support Asad.
Question 2: Mr. Harrell, you testified that the ISIL oil trade is largely cash based, without significant linkages to banks or other financial institutions. Furthermore, you stated that the Treasury and State Departments have cracked down on money changers and exchange houses that help ISIL move cash into and out of its territory. But ISIL’s reach is expanding, and it seems likely some of this money is financing affiliates around the globe. What do you see as the weaknesses in US efforts to restrict the flow of ISIL funds? What else should the US be doing keep ISIL’s cash out of the hands of potential terrorists in the United States and Europe?

Answer: Senator Wyden, as you say in your question, one of the real challenges we face in counterizing ISIS’s finances is that although much of ISIS’s money is in cash and in ISIS-controlled territory, ISIS-linked and ISIS-inspired attacks in Paris, Orlando, San Bernardino, and other cities are low-cost affairs and ISIS’s ability to move even small amounts of money can support devastating terrorism against the United States and our allies. For example, the ISIS terrorists involved in the 2015 Paris attacks, which were estimated to cost just over $30,000, used pre-paid debit cards to help cover their expenses. It is critical the European Union continue to enhance both its internal information sharing regarding terrorist financing and also joint U.S.-E.U. terrorist finance sharing mechanisms. I also recommend that the U.S. develop a model, similar to one launched by the U.K government and major U.K. banks in 2015, in which certain designated officials at major U.S. banks would receive security clearances so to enable better two-way information sharing on ISIS and other terror finance threats between the U.S. Treasury Department and the private sector.

In addition to combating financing of these lone-wolf and small-group attacks, the U.S. government needs to continue working with U.S. and international information technology companies to crack down on ISIS’s ability to spread propaganda and recruit sympathizers online. The U.S. must always remain committed to our First Amendment principles, but we also need to develop practical ways to counter ISIS’s online recruitment efforts.

Question from Senator Debbie Stabenow

Question: Mr. Harrell – You offer a number of options that the U.S. and our allies could take to disrupt the oil revenue ISIS is receiving. From escalating military strikes on oil infrastructure and tanker trucks, to pressuring governments in neighboring countries to crack down on oil smuggling.

Some in Congress are using the troubling rise of ISIS to justify lifting the ban on U.S. crude exports and increasing domestic oil production. However, other polices that enhance energy security receive scant attention. For example, policies Congress enacted that spurred the development of highly fuel efficient and electric vehicles have reduced
oil consumption. Another example is the Department of Defense’s work to utilize next-generation biofuels. Our military leaders have made clear that diversifying our fuel mix with domestically produced advanced biofuels is a national security imperative.

Do you have any thoughts on whether lifting the ban on oil exports would have any impact on reducing the oil revenue that ISIS is receiving?

Answer: Senator Stabenow, thank you very much for the question and for the opportunity to testify to your committee. Since I had the opportunity to testify in person to your committee, Congress enacted legislation ending the ban on exporting U.S. oil to international markets. There were a number of justifications for the decision to lift the ban, including enabling the United States to become a reliable, stable source of energy for U.S. allies and potentially reducing the role of certain foreign governments in international oil markets. With respect to ISIS, however, ISIS-produced oil is largely consumed in local markets in Iraq and Syria and, to some extent, in adjacent countries. As a result, I do not expect that the decision to end the ban on U.S. oil exports will have a large-scale impact on ISIS’s oil-related revenues.
U.S. Senate Committee on Energy and Natural Resources
December 10, 2015 Hearing: Terrorism and Global Oil Markets
Questions for the Record Submitted to Mr. Jamie Webster

Question from Senator Al Franken

**Question:** I understand that you authored a report in 2014, titled “U.S. Crude Oil Export Decision: Assessing the Impact of the Export Ban and Free Trade on the U.S. Economy.” In this report you argue for the benefits of exporting oil, which is also the subject that you focused on at the hearing. However, I’m concerned that your research findings were funded by a consortium of petroleum producers. As we all well know, these companies have been lobbying Congress for some time now to lift the ban on oil exports. Do you believe that receiving funding from the oil industry for your research poses a potential conflict of interest?

No. Our analysis is objective and independent. As with all IHS research, the findings and conclusions are solely our own. The ban on exporting crude oil was an antique. It was put in place to support a system of price controls that Presidents Carter and Reagan abolished three and a half decades ago. The lifting of the ban was strongly advocated by America’s most important allies, the European Union and Japan for reasons of energy security. It was anomalous to maintain this ban when, for four decades, the U.S. government has been calling for open trade in other commodities, and indeed has recently criticized China for exactly this kind of ban on rare earths. We made clear the funding for reasons of transparency. We generally favor free trade—a flow of exports and imports guided by economic principles—whether it is in commercial airliners, agricultural products, films, or medical devices.

Question from Senator Debbie Stabenow

**Question:** Mr. Webster—There is no denying that global oil markets are critical to the security and economies of the U.S. and countries throughout the world. And I share the concerns about the threat posed by ISIS. Over the last year, proponents of lifting the U.S. crude export ban like yourself cite ongoing international conflicts—including the troubling rise of ISIS—to justify lifting the export ban.

As you are aware, negotiations are ongoing about lifting the ban in exchange for extending incentives for renewable energies and advanced manufacturing, and other policy priorities. However, I am not aware of any consideration of repealing even a single permanent tax incentive the oil industry receives as part of an agreement.

In your testimony, you state that “market incentives alone will help push U.S. oil producers to produce more as prices rise,” but current crude export policy can “limit the full upside of this production increase.” If that is the case, is it necessary for Congress to continue offering tax breaks for this mature industry, particularly when some of these
incentives have been on the books since 1916 and maintaining them in this difficult budgetary environment costs the government tens of billions of dollars?

I am not sure which tax provisions you are addressing. The often-cited Domestic Manufacturer’s Deduction is available to all qualifying taxpayers, including the automobile industry. As I understand it, this deduction is generally 9 percent, but has been limited to 6 percent for the oil and gas industry. Universal application also applies to the foreign tax credit.