

The U.S. Tight-Oil Boom

Geopolitical Winner or Long-Term Distraction?

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Introduction

Since peaking in 1970, oil production in the United States steadily declined as old fields matured and depleted. However, the decline was dramatically reversed in 2009.

Advancements in hydraulic fracturing and horizontal drilling have already unlocked vast new natural gas resources from shale rock. This “Shale Gas Revolution” has transformed the domestic natural gas sector and reverberated through energy markets around the world.

The same innovations in drilling for shale gas are leading to a surge in U.S. oil production as well. The U.S. is now producing oil at the highest rate in 20 years. From January 2009 until April 2013 U.S. oil production jumped by 30%, rising from 5.1 million barrels per day (mb/d) to 7.3 mb/d.¹ In 2011, for the first time since 1949, the U.S. became a net exporter of petroleum products (which includes oil, natural gas liquids, and finished products such as gasoline and jet fuel).²

With the sudden uptick in U.S. shale oil (or “tight oil”) production, there will be implications for geopolitics. In the short-term, more U.S. oil production has relieved price pressure in global oil markets, providing some extra production to the global oil supply. This has reduced volatility and prevented oil prices from rising higher than they would have absent a U.S. oil boom. It may also have slightly reduced the leverage that antagonistic nations have over oil prices and allowed the international community to step up pressure on Iran’s nuclear program.

Over the long-term, however, the tight oil boom in the U.S. will not revolutionize American energy security. At best, it provides a bit of breathing room as the world moves towards cleaner sources of energy. At worst, it delays that transition by creating the illusion of energy security, thereby reducing the urgency for developing alternative sources of fuel.

This Perspective Paper outlines these contradictions – the U.S. tight oil boom has short-term geopolitical benefits, but over the long-term it does not provide real energy security.



The Geopolitics of the U.S. Tight Oil Boom

U.S. Tight Oil Boom in Global Context

Total global oil production reached an all-time high in 2012 at an estimated 86 mb/d.³ The incremental increase in global oil production from 2011 to 2012 – an estimated 1.2 mb/d – is only slightly more than the additional U.S. production for the same period. In 2012, U.S. oil production increased by more than 1 million barrels per day, the highest annual increase in U.S. history.⁴ In other words, the net addition to global supplies came almost entirely from the United States.

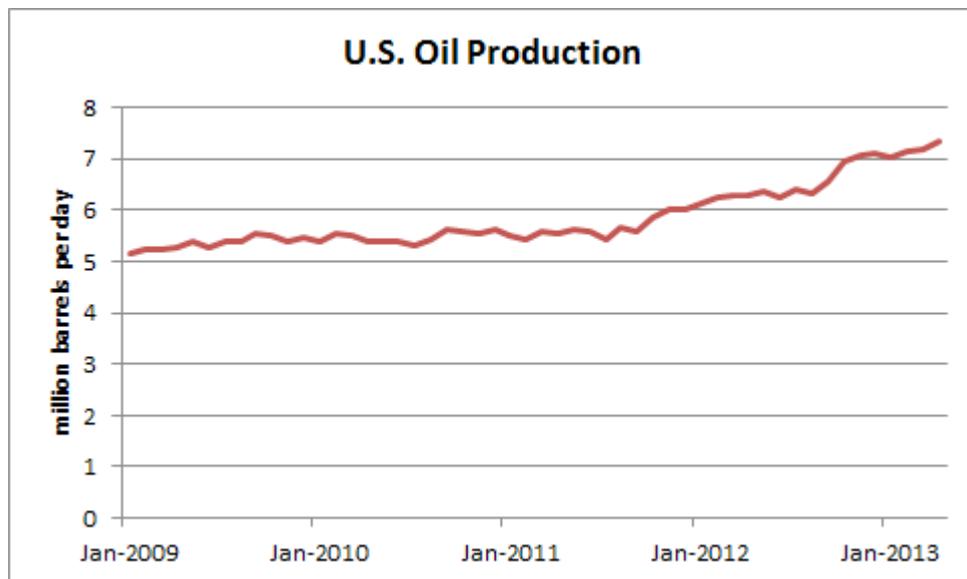
The only other country to come close to the increase from the U.S. was Libya, who brought 1 mb/d back online in 2012 after losing nearly the same amount the year before in its revolution.



Bakken Oil Rig, North Dakota

The “Shale Revolution” has sparked a drilling frenzy in the U.S.

In 2012, there were 1,919 active drilling rigs in the U.S., more than the rest of the world combined.⁵ If the industry can continue on an upward trend, the IEA predicts that by 2020 the U.S. will surpass Saudi Arabia to become the largest oil producer in the world.⁶



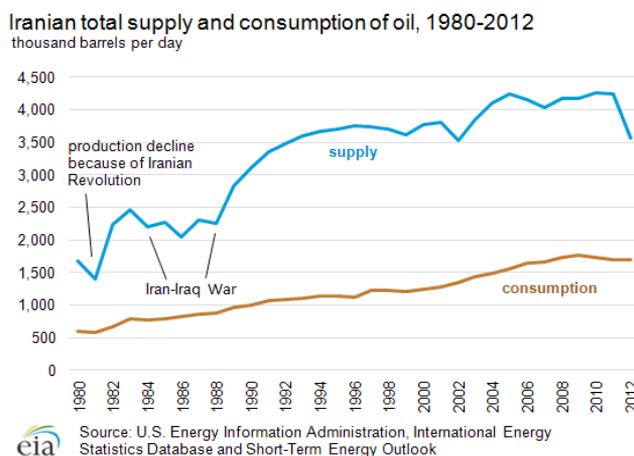
Tight Oil and Sanctions on Iran

One of the most specific geopolitical consequences of the tight oil boom is the additional leverage it provides the U.S. and European Union against Iran in the short-term. Iran derives over 50% of its government revenue and 80% of its total export income from oil, and is the world's fourth largest producer.⁷ Continued production and export has propped up the regime and provided the means to further its nuclear program, notwithstanding Western sanctions designed to curtail it.

Prior to the spike in American oil production, OECD nations and emerging markets most dependent on Iranian oil—Turkey, Japan, South Korea, India, and China—feared that the removal of Iranian sources would tighten global supplies too drastically, sending prices skyward. For example, the International Monetary Fund stated in its 2012 World Economic Outlook, “A halt of Iran’s exports to Organization for Economic Cooperation and Development (OECD) economies [if not offset] would likely trigger an initial oil price increase of about 20 to 30 percent.”⁸

The tight oil boom in the U.S., however, has provided additional supplies to oil markets, allowing the international community to tighten sanctions on Iran without a dramatic effect on prices.

With room to maneuver, the international community targeted Iran’s energy sector for sanctions. This includes the Iranian state oil company, major shipping, tanker, and port companies, and the central bank. In July, 2012, the European Union boycotted Iranian oil and petrochemicals completely (20% of Iran’s oil exports), and canceled all insurance for tankers carrying Iranian product. The measure affects 95% of the world’s tankers.



Iranian oil production suffered as a result. From 2011 to 2012 the production of petroleum products in Iran dropped 17%.⁹ Net export revenue dropped from \$95 billion to \$69 billion as the international sanctions succeeded in reducing exports from 2.5 mb/d to 1.5 mb/d. Average exports to China and India, two of Iran’s biggest export markets, decreased from some 0.88 mb/d to 0.76 mb/d, suggesting increasing compliance with sanctions. Foreign investment in Iranian energy is down, the Rial is collapsing (inflation skyrocketing), and unemployment is up.

The international community is undoubtedly inflicting damage on the Iranian economy, but the stated objective of economic sanctions is to bring Iran to the table to reach a deal on its nuclear program. It remains to be seen how the newly elected President, Hassan Rouhani, and the Supreme Leader will respond to sanctions. It is far from certain that economic sanctions increase the likelihood of a political deal with Iran. However, what is clear is that by making up for the shortfall in Iranian oil production, the tight oil boom in the U.S. has allowed the international community to tighten the screws on Iran without significantly raising global oil prices.

OPEC and Spare Capacity

The 12-member Organization of Petroleum Exporting Countries (OPEC) has historically held significant influence over oil prices. OPEC brings some 30 mb/d to the global market (60% of the total trade), and alterations of its production quota exerts influence over global supply and demand.

Spare capacity allows OPEC to increase supplies on short notice in response to supply disruptions. OPEC's spare capacity is largely concentrated in Saudi Arabia. Lower spare capacity creates fear in the markets that supplies will struggle to meet demand in the event of an outage. Unexpected geopolitical events such as civil wars and sabotage of infrastructure tighten markets, placing risk premiums on top of the price of oil.

In 2012, as the global economy continued to recover from the financial crisis, rising oil demand shrank OPEC's spare capacity to its lowest levels since 2008.¹⁰ American tight oil production climbed rapidly in the last year, however, allowing Saudi Arabia to withhold production and increase its spare capacity. Saudi Arabia holds back production for its own self-interest – to maintain higher prices.

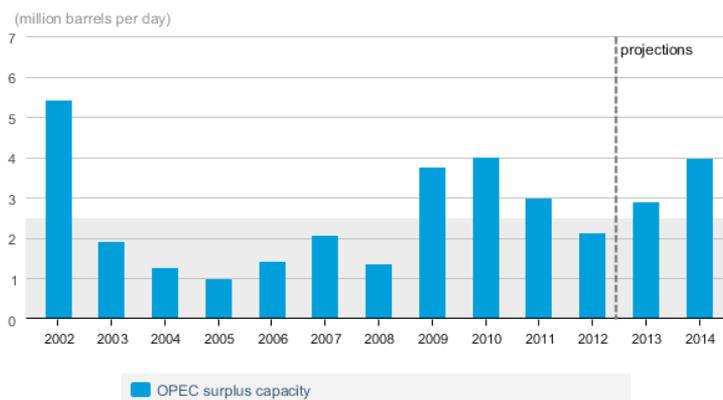
The EIA projects that OPEC production will decline by 620,000 barrels per day in 2013, largely in response to U.S. supply growth.¹¹ Saudi Arabia cut production to 9.4 mb/d in June 2013, down from 9.8 mb/d a year earlier.¹²

OPEC's cut back was intended to prevent prices from dropping, which it did successfully. Prices for Brent crude have so far averaged \$107 per barrel in 2013, largely unchanged from an average of \$111 in 2012. Yet as OPEC cuts back to prop up prices, it loses revenue and market share. U.S. production is weakening the influence of the cartel, albeit in a small way.

Another effect of rising U.S. production is that U.S. supplies have effectively built back spare capacity, giving markets more confidence and lowering price volatility. OPEC spare capacity grew from 2.1 mb/d in 2011 to 2.3 mb/d in 2012. In 2013 spare capacity could reach 3.6 mb/d, the same levels that OPEC averaged between 2009 and 2011.¹³

This trend is noteworthy. Higher slack capacity is a boon to the stability of global oil markets and it reduces price volatility.

OPEC Surplus Crude Oil Production Capacity



Source: Short-Term Energy Outlook, August 2013

Note: Shaded area represents 2002-2012 average (2.5 million barrels per day)

U.S. Engagement in the Middle East and Africa

The United States' commitment to security in the Middle East and Africa is not a function solely of dependence on foreign oil. In reality, Canada is the biggest supplier of oil imports to the U.S., accounting for 28% of the total.¹⁴ The U.S. imported only 20% of its oil from Persian Gulf countries in 2012 (13% from Saudi Arabia), and yet the Fifth Fleet continues a broad security mission in the Persian Gulf, Arabian Sea, Red Sea, and East Coast of Africa, upholding an expanded 'Carter Doctrine.'¹⁵

The security of petroleum supply lines is a global problem, and U.S. allies and trading partners like Canada, China, and Japan are more highly dependent on Middle Eastern sources than is the U.S. itself.¹⁶

U.S. policy priorities in the region are geopolitical in nature: support for Israel, countering Iran's nuclear ambitions, engaging in counter-terrorism operations, and support for other allies that further U.S. interests.

These are all reasons why the U.S. will likely keep a robust military presence in the Middle East and Africa.

The U.S. will remain a top investor in regional stability through military and economic aid, the largest recipients of which—Israel and Egypt—are not major oil exporters.¹⁷

However, oil has undoubtedly played a significant role in U.S. engagement abroad.

The U.S. has been actively involved in the Middle East for decades. The U.S. Fifth Fleet ensures the free flow of oil in the Persian Gulf; the Navy acts as a "guarantor" of the free trade of oil. This is at the core of the Navy's mission in the region.

Africa gained more prominence under the Administration of President George W. Bush, which saw African oil as a strategic resource and determined that imports from Africa could allow the U.S. to diversify away from its dependence on the Middle East. That policy has continued under the Obama Administration.¹⁸



The U.S. tight oil boom may upend these relationships. For example, tight oil coming from American shale formations is light and sweet (low sulfur). This production is rapidly replacing imports from Africa, where oil is similar in quality and type. The U.S. imported 395,000 barrels per day from Nigeria in May 2013, less than half the total from only two years ago.¹⁹

Projections that the U.S. could become a net oil exporter by 2030 will likely mean the Middle East and Africa experience declining relative geopolitical importance for the U.S. With declining dependence on the Middle East and Africa as sources of oil imports, coupled with Pentagon budget cuts and the larger 'pivot' to Asia,

there may be calls to scale back U.S. engagement in the Middle East and Africa. It may also provoke fears among oil partners like Saudi Arabia that the U.S. is poised to abandon the region.²⁰

However, strategic partnerships need not be dependent on the extent of an oil relationship. Instead, these partnerships will merely need to evolve. The U.S. is more likely to fine-tune its foreign policy and pursue different issues in these regions, rather than abandon them.

The Tight Oil Boom Does Little for Long-Term Energy Security

How Long Will the Boom Times Last?

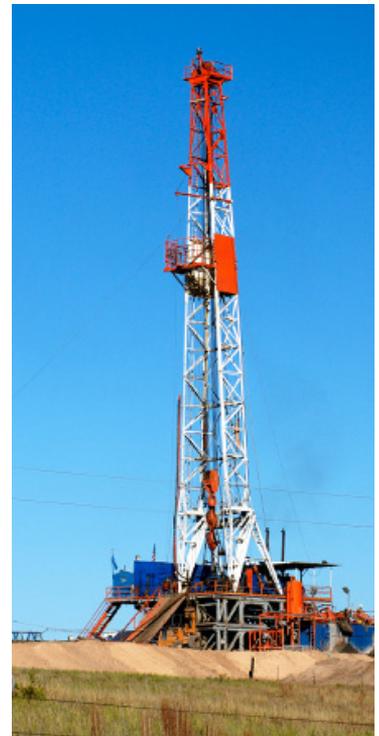
While oil production has rapidly climbed in the last few years, the longevity of the tight oil boom is unknown. Production rates from tight oil wells tend to peak early then drop off precipitously. For example, a typical well could experience a 40%-50% decline in productivity at the end of its first year, and a further 30%-40% decline in year two.²¹ This means that a vast number of new wells must be brought online just to maintain steady production, which is why there is such a high presence of drilling rigs in the U.S. It is unclear at this early stage if the industry can keep up such a frenetic drilling pace in order to meet the heady projections for oil production in the years ahead.

In addition, high U.S. oil production is at the mercy of the price of oil. Unconventional oil wells are not cheap, with a break-even point around \$85 per barrel for marginal wells.²² With the best wells drilled first, the industry will need to move on to less desirable areas. If the global economy sputters or oil production elsewhere climbs higher than anticipated – both of which would send oil prices downwards – high cost producers would be forced out of the market. Sustained low oil prices would choke off the tight oil boom.

Relatedly, OPEC could view the tight oil boom in the U.S. as a strategic threat and decide to flood the market. Saudi Arabia, as the lone swing producer, could quickly ramp up production to depress prices. As high cost producers, U.S. companies would go out of business. Saudi Arabia would be hurt as well, but could suffer in the short-term to maintain market share in the long-term. This is an unlikely scenario, as Saudi Arabia seems to prize price stability above all, but one that should not be ruled out.

Energy Independence is the Wrong Goal

Producers believe that oil production in the U.S. can continue to climb upwards. At the same time, oil demand in the U.S. has plateaued and potentially entered into an extended period of decline. Rising fuel efficiency in the nation's auto fleet and changing consumer habits likely means that U.S. oil consumption has peaked. Nascent alternative vehicle technologies (electric vehicles, biofuels, compressed natural gas) have the potential to cut into demand further.



Oil Rig in Permian Basin,
Texas

Taken together, these two phenomena – rising oil production and declining demand – are fueling speculation that in the coming years the U.S. may finally reach “energy independence” or “energy self-sufficiency,” a goal sought by every American president dating back to Richard Nixon.

However, this goal is misguided. It is irrelevant if the U.S. produces as much oil as it consumes instead of relying on imports. Crude oil is a global commodity with a global price. More U.S. oil production only lowers the price insofar as it adds to global supply. As this paper has argued, the surge in U.S. tight oil production has provided a bit more spare capacity, but significant and extended price declines are unlikely.

Moreover, achieving “self-sufficiency” does very little to reduce U.S. vulnerability to supply disruptions. Higher domestic production may improve the U.S. trade balance, but American consumers will still be vulnerable to the global price of oil. Oil markets are volatile, and geopolitics in oil producing areas can drive up prices around the world – instability in Baghdad or Tehran can lead to price spikes in Des Moines or Indianapolis even if the U.S. is producing as much oil as it is consuming. There is no added security benefit at the pump simply because the barrel of oil is “American.”

Climate change

The more pernicious problem presented by the recent tight oil boom is one of complacency about climate change.

U.S. energy policy has historically prioritized reducing prices. For decades this led to policies that sought to increase oil production. Policymakers opened up vast areas of the outer continental shelf for offshore oil drilling, the U.S. military secured shipping lanes to ensure the free flow of oil, and tax policy and public-private partnerships created incentives for drilling innovation.

However, as oil prices skyrocketed to unprecedented heights in 2008, along with two smaller spikes in 2011 and 2012, an alternative argument gained ground – that in order to insulate American consumers from oil price volatility policies needed to target demand. In other words, the goal became to use less oil.



This had the added benefit of dovetailing with climate policy. Oil dependence not only threatens national security from supply disruptions, price spikes, and distorting American foreign policy goals, but it also contributes to climate change. Attacking oil demand – largely through vehicle efficiency and developing alternative fuels – could improve national security and reduce greenhouse gas emissions at the same time.



The challenge with the recent tight oil boom in the United States is maintaining political momentum to address climate change amidst newfound energy abundance.

For supporters of action on climate change, the tight oil boom threatens to take their eye off of the ball. For policymakers who opposed action on climate change to begin with, the tight oil boom has created useful political cover. By fully embracing the tight oil boom as an unadulterated “good” thing for national security, many have used the veneer of “energy independence” to mask a failure to lay out innovative solutions to climate change.

Conclusion

As the largest consumer of oil in the world, the U.S. has long been held hostage to global oil markets. Now, in an era of surging oil production, largely from innovations in drilling for oil in shale rock, the U.S. is poised to become a dominant oil supplier.

It is clear that this has brought some short-term benefits. The U.S. has helped cap global oil prices, with additional supplies helping meet rising global demand. More American oil has also helped restore global spare capacity, easing pressure on Saudi Arabia to supply global markets. This has reduced price volatility. With prices under control, the U.S. and Europe were able to marshal international cooperation to cut off a significant portion of Iranian crude oil production in order to ratchet up pressure on Iran’s nuclear program.

Policymakers in Washington are celebrating this turn of events. However, the tight oil boom masks other vulnerabilities and creates new problems at the same time. It creates the illusion of energy security and has reinvigorated calls for “energy independence,” which often comes in the form of simply relying on greater oil production. This does little to reduce America’s vulnerability to oil prices over the long-term. More importantly, the tight oil boom has dashed momentum on climate change in the short-term, allowing policymakers to position fossil fuel production as the centerpiece of the country’s energy policy.

Over the long-term, higher domestic oil production does very little for national security. Instead, reducing demand and developing alternatives should remain America’s top priority.

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Endnotes

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