



Barrels at Risk

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SUMMARY

- The current instability in multiple oil producing regions means that supply disruption vulnerability is particularly high. Flashpoints include Iran, the Strait of Hormuz, Nigeria, Iraq and Libya. If as few as two supply disruptions occurred simultaneously, demand for available spare capacity would be overwhelmed. But, even the threat of a single oil disruption has the ability to push oil prices substantially higher.
 - The vulnerability of the liquid natural gas (LNG) market is also high; in the event that the Strait of Hormuz is closed, some 22% of the world's LNG exports would be trapped. As LNG is frequently transported directly to the point of consumption, there is no such thing as spare export capacity, and many LNG importing countries have no strategic reserves.
 - Certain resources are at risk of never being developed for political reasons, particularly in OECD countries. The United States is a culprit, with political obstacles blocking access to a possible 1.4 million barrels of oil per day.
 - While it is impossible to know the full volume of accessible oil and gas reserves currently unutilized, it is clear that global production could be increased.
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INTRODUCTION

If the oil market was working normally, prices would be falling. Growth is slowing in Europe, and recovery in the U.S. remains weak. Meanwhile both China and India are in the grip of their own debt crises, and spare capacity is forecast to grow from 2.5 million barrels per day (mbd) to 3.25 mbd over the course of 2012, according to the Department of Energy. However, prices remain at historic highs due to the remarkably large numbers of barrels currently offline or at risk of political disruption in the short-term.

During the first quarter of 2012, the International Energy Agency (IEA) reported that unexpected outages and disruptions outside of OPEC totaled a whopping 1.1 mbd. The political crisis between Sudan and South Sudan was a major culprit, but so were outages due to weather and equipment in the North Sea and Canada. Instability in Yemen and Syria took additional barrels off the market as well. For the second quarter, IEA currently projects these outages and others will actually increase to affect 1.3 mbd. Below, we focus on five flashpoints where barrels are at risk for political reasons: Iran, the Strait of Hormuz, Nigeria, Iraq, and Libya.

In sum, the potential impact of short-term disruptions—and thus the impact that the risk of such disruptions will have on the oil price—can be expected to grow in coming years as political obstacles constrain future oil production growth. While national oil companies in the Middle East, Russia and Latin America are often blamed for constraining supply growth, policies in the United States and its fellow oil-producing OECD members are also to blame.

Iran Iran's exports to Europe have already largely stopped, well in advance of the July deadline of the sanctions, because of difficulty financing trade with Iran. If India, Turkey and South Africa join the US-led boycott of Iranian oil, exports would fall by a further 500,000 barrels, leaving China as Iran's only feasible major export market. Indeed, China is using Iran's distress as an opportunity to renegotiate prices.

Equally important in the longer term, the current conflict increases the barriers to investment in the Iranian oil industry. Despite massive increases in oil prices driven by high oil demand, and a growing population increasing pressure on government spending, sanctions have meant that Iran has been unable to increase production despite ample reserves. Instead, production of crude and natural gas liquids has reached a plateau of 4.2 million barrels a day. These constraints will ideally pressure Iran into resolving its nuclear issues and increasing investment in production, but until this happens, output will be structurally constrained and—as we saw in Iraq—it can take up to a decade for production to recover when an oil province is re-opened to the industry after a period of neglect.

In Iran, the impact of underinvestment is clearest in the gas industry. Qatar exported 95 billion cubic meters of LNG from its North Field (the world's largest gas field) in 2010. Geologically, the field extends across the border to Iran, which exported exactly zero billion cubic meters of LNG in 2010 due to financing and project delays, as well as lack of access to equipment. This underinvestment means that it will take decades for Iran to reach its production potential even if it renounced nuclear weapons and sanctions ended today.

Markets are already impacted by worries about the risks of Iran disrupting oil and LNG exports through the Strait of Hormuz. As discussed in [our last Iran intelligence report](#), the disruption would be both partial and temporary even if this were to happen. Nonetheless, both oil and LNG markets would likely experience high levels of volatility in the event of such a disruption, and we believe that the impact on gas markets could be even more extreme than the impact on oil markets. Approximately 22 percent of world LNG exports would be trapped if Hormuz were closed. The impact of an LNG disruption on both the price of gas and availability of gas would be much greater than for a similar disruption in the oil markets for three reasons:

- Gas supply chains are remarkably short. The gas in your stove left the ground less than a week ago, whereas the gasoline in your car was likely produced as crude oil several months ago.
- There are fewer options to replace gas with spare production capacity; indeed there is basically no such thing as spare LNG export capacity.
- Some LNG importers have little or no gas in storage (including the U.K., the largest buyer of LNG through the Strait of Hormuz).

Iraq While Iran skirts the brink of serious conflict, sectarian violence in Iraq is growing with the withdrawal of U.S. troops. Although Iraqi oil production rose in the last three months of 2011, if sectarian violence grows, it could potentially endanger existing production and will likely reduce investment in future production increases. Already, there has been at least one documented incident in which oil production equipment has been destroyed due to rising violence.

Perhaps more worrying for oil production in the longer term, however, is the continued failure of the central government and the autonomous government in Kurdistan to agree on a framework for revenue sharing. Furthermore, the central government exerts strong pressure on companies not to sign contracts with the Kurdish government. Along with continuing uncertainty, this has become a significant obstacle to investment.

Libya Iraq is not the only post-conflict country where continued instability threatens oil production. Libya's conflict was much shorter and, as such, oil production has recovered to roughly 60 percent of its prewar level. However, the new government remains unable to maintain law and order. Revolutionary militias have not been disbanded; rather they continue to hold substantial political and military power. The National Transitional Council has warned that competition among armed groups may lead to a descent into civil war.

This is particularly worrying for the oil industry because Libya did not have a real state apparatus under Gaddafi, nor does it appear to have one now. Consequently, even relatively low-level political competition raises concerns both that oil companies operations will not be safe and that their license to operate will become politically untenable. A new civil war could meaningfully disrupt exports, while continued political uncertainty and insecurity will prevent the investment needed for production to recover to prewar levels.

Nigeria The Middle East does not have a monopoly on disruption risks to oil supplies: Nigeria, a perennial problem for oil markets, also makes the cut. Violence against oil installations has been a persistent feature of politics in Nigeria, where political actors mobilize militias to disrupt oil supplies to secure political patronage. In recent months, President Goodluck Jonathan has been weakened substantially both by his inability to contain violence from the Islamist terrorist group Boko Haram in the north and by a bungled fuel price reform that led to a general strike. A weak president has to cope with a country wracked by protests against the economically sensible removal of fuel subsidies.

A weak center that is perceived as unable to contain political violence raises the likelihood that both political actors and criminals will disrupt oil supplies. Indeed, the recent gubernatorial election in President Jonathan's home state of Bayelsa saw an attack on a mid-sized local pipeline. Going forward, the real risk is that President Jonathan will not be able to maintain power, leading to early elections, as well as erosion of federal power in favor of state power, or even a coup d'état. Any of these scenarios would lead to substantial political competition, with accompanying disruption of oil production.

Current Disruptions In addition to these large potential disruptions, there are currently 700,000 barrels of oil being disrupted each day in Yemen, Syria and South Sudan. In Yemen and Syria, strikes, violence, political unrest and (in Syria's case) an oil embargo by the US and EU have led to almost a complete disruption of exports. While South Sudan is no longer wracked with violence, it has voluntarily halted exports in a high stakes game of chicken over revenue sharing with its former masters in North Sudan. South Sudan is looking to build new pipelines through Ethiopia, Kenya and Djibouti to bypass North Sudan, but this will take many years.

Spare capacity needs to increase by 240% to allow for these disruptions

The table below summarizes these flashpoints and indicates that an additional 7.25 mbd of oil exports could be disrupted under a plausible worst case scenario by the events above—bringing total outages to 8.5 mbd. Effective OPEC spare production capacity is currently 2.5 mbd. While this level is adequate to address some of these problems in isolation, it certainly is not adequate to address a combination of issues for several reasons. First, the Iran and Iraq disruptions together would already exceed spare capacity. Second, much of the oil under threat is light crude, while the spare capacity is almost entirely heavy crude. Third, almost the entirety of global spare capacity is within the Persian Gulf, and thus would be cut-off if the Strait of

Hormuz were closed. Finally, as illustrated in the table below, spare capacity is also needed to cope with natural disasters. Natural disasters on par with Hurricanes Katrina and Rita would push disrupted volumes even higher. In short, we estimate that spare capacity would need to increase by 6 mbd, or 240 percent—and half of this increase would need to be outside of the Persian Gulf—in order to cover all of the disruptions outlined below, giving confidence that the oil market could withstand a series of major disruptions.

Flashpoint	2010 Production	2009 Net Exports	Size of Potential Disruption	Scenario
Iran	4.25	2.41	1.91 (79%)	All Iranian Exports embargoed except 500kbb/d to China
Strait of Hormuz	n/a	~17	2.50 (15%)	Scenario from previous SAFE Intelligence Report: 30% reduction in traffic through Strait, Saudi bypass pipeline used to full capacity
Iraq	2.46	1.76	1.46 (83%)	All production from southern fields disrupted
Libya	~1.66	1.53	0.75 (49%)	Two-thirds of Sirte Basin production disrupted by violence
Nigeria	2.46	1.94	0.63 (32%)	Half of estimated onshore production disrupted
Flashpoints Subtotal	9.23	24.64	7.25 (29%)	
Yemen	0.264	0.19	0.17 (90%)	Strikes, violence and political unrest have largely halted exports
South Sudan	0.486	0.37	0.37 (100%)	Dispute over revenue sharing has led South Sudan to halt oil exports through North Sudan
Syria	0.385	0.14	0.14 (100%)	Strikes, violence, political unrest and the US and EU embargo have largely halted exports
Current Disruptions	1.14	0.705	0.69 (97%)	
Natural Disaster			.55 (34%)	Repeat of a Katrina and Rita size disruption
Total			8.49	2.65 times spare capacity

Source: BP Statistical History of World Energy 2011, Energy Information Administration, Financial Times, Al Arabiya, Bloomberg, SAFE estimates

The long-term above ground challenge: Obstacles to production globally, including in the US

In order for spare capacity to increase, substantial new volumes of oil would need to be brought on stream. It should be noted that strategic oil reserves could be used in place of spare capacity if reserves holders developed a clear, coordinated approach on when and how reserves would be used. Although all of the flashpoint countries are at least producing and exporting oil at the moment, around the world millions of barrels are at risk of never being produced for political reasons. There are basically two reasons for this: state control of the oil industry and political decisions to remove large areas from exploration and development.

Political obstacles to foreign participation have led to serious problems of inefficiency and distorted incentives in a number of developing countries. While this is a persistent feature of oil and gas industries of much of the Middle East, Russia, and Mexico, its impact is perhaps most

obvious in Venezuela, where oil production has fallen from 3.48 mbd in 1998, the year before President Chavez was elected, to 2.47 mbd in 2010.

However, the United States also bears a share of the blame for adopting moratoriums that have removed large areas (i.e. the Outer Continental Shelf and the Arctic National Wildlife Refuge) from production. Modeling by SAFE suggests that these areas could produce upwards of 1.5 mbd by 2025, somewhere between the current oil production levels of the UK and Kazakhstan. Europe now appears at risk of making a similar mistake if it declares an effective moratorium on production of oil and gas from shale, although it is unlikely that European shale resources are of the same order of magnitude as U.S. Outer Continental Shelf and the Arctic National Wildlife Refuge resources.

Country	Volume not Produced (mbd)	Scenario
Venezuela	1.20	Moderate production growth from pre-Chavez base
Saudi Arabia	2.00	Faster exploitation of existing fields, exploration throughout the country
Russia	1.00	Expanded infield drilling in Western Siberia, production in Yamal and Eastern Siberia
Mexico	1.20	Deepwater offshore in the Mexican section of the Gulf of Mexico
Nationalization Subtotal	5.40	
U.S.	1.50	SAFE modeling
European Shale	0.46 (oil equivalent)	Assumes European shale equivalent to current Netherlands gas production
Moratoriums Subtotal	1.96	
South China Sea	2.10	Production profile similar to Brazil, consistent with USGS
South Caspian	0.67	Additional fields with two-third the capacity of Azerbaijan's ACG field
Disputes subtotal	2.77	
Total volume not produced	10.13	

Finally, continued disputes, particularly maritime disputes, prevent large potential resources from being produced. The two most notable are the ongoing dispute over the South China Sea, which is claimed to varying degrees by seven different countries, and the South Caspian Sea, where a potentially large field remains untapped because of a maritime border dispute among Azerbaijan, Iran, and Turkmenistan.

The table above estimates production that is not available due to these two types of disruptions. However, it should be noted that this is speculative at best. It is impossible to know how much any of these countries could produce if they opened their entire resource base to

efficient production, due to lack of geological data and exploration in these basins. Nonetheless, it is clear that removing these long-term obstacles to production could not only comfortably supply the necessary increase in spare capacity to provide confidence that the oil markets can weather multiple future disruptions, but also in fact substantially increase total global oil production, bringing down prices and increasing global energy security.

This above-ground risk places the United States and other developed countries in an awkward position. By neglecting to take the difficult political decisions that are necessary both to expand their own oil production and to reduce their reliance on oil, they have left their economies at the whim of bandits, autocrats and kleptocrats throughout the developing world. The post-Fukushima shift away from nuclear power only exacerbates this trend, as oil, gas and coal will be needed for power production.
