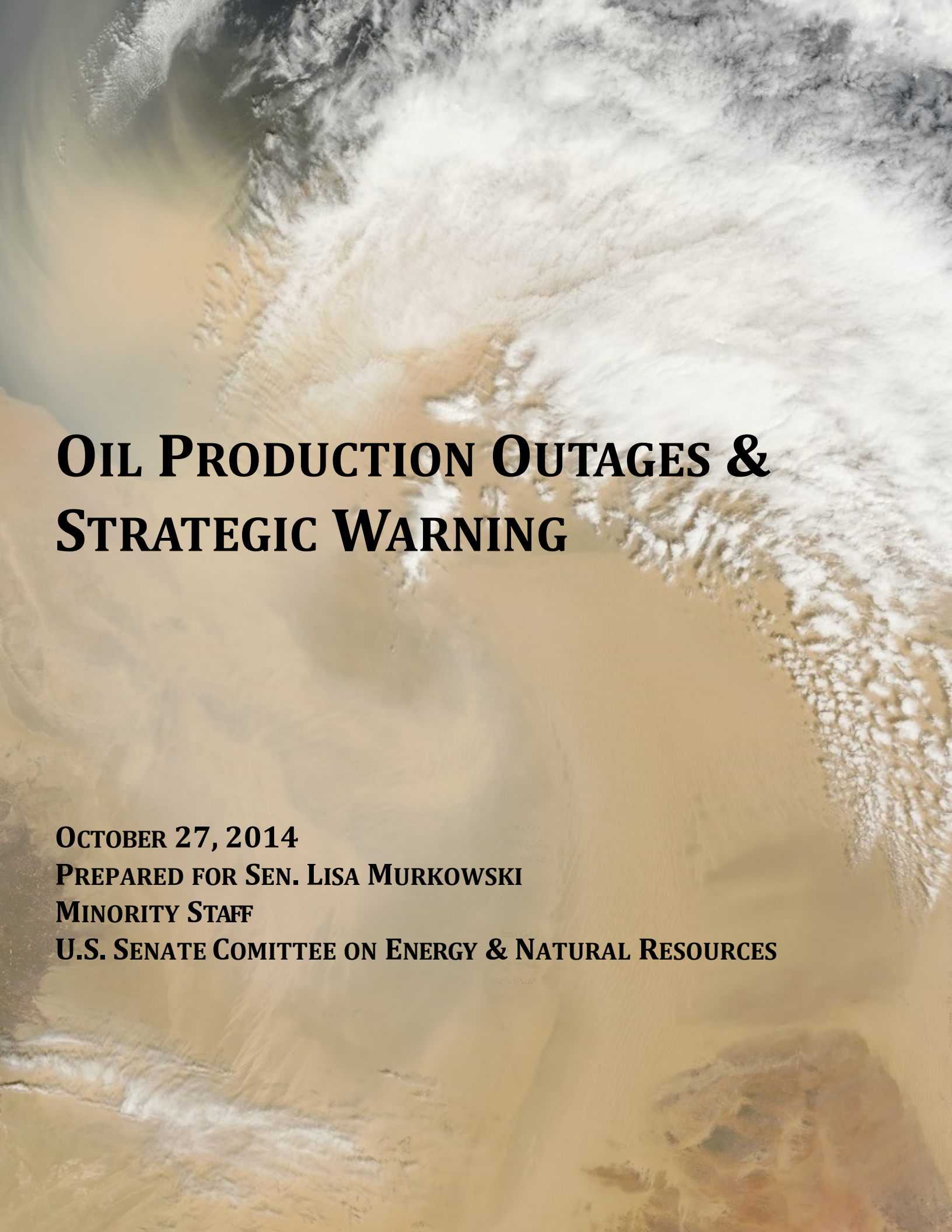

Oil Production Outages & Strategic Warning

October 27, 2014

Prepared for Sen. Lisa Murkowski
Minority Staff
U.S. Senate Comittee on Energy & Natural Resources

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Prepared by Minority Staff for Ranking Member Lisa Murkowski
U.S. Senate Committee on Energy & Natural Resources
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Introduction

Petroleum producers may intentionally suspend production to conduct maintenance and safety reviews or because of economic reasons. Production can also be lost due to weather, natural disasters, sabotage, terrorist attack, commercial disputes, and unforeseen maintenance. Unplanned losses or "outages" in petroleum production can often function as an analytical lens to describe instability in a given country and in some cases can serve as an early warning indicator for rising turbulence.[1] This report reviews current unplanned outages from around the world, as tracked by the U.S. Energy Information Administration.[2]

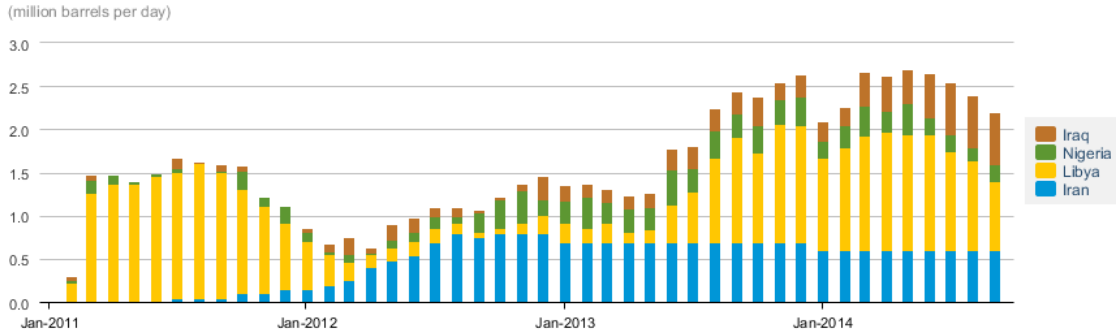

Figure 1. Unplanned Outages in OPEC Nations (Source: EIA)

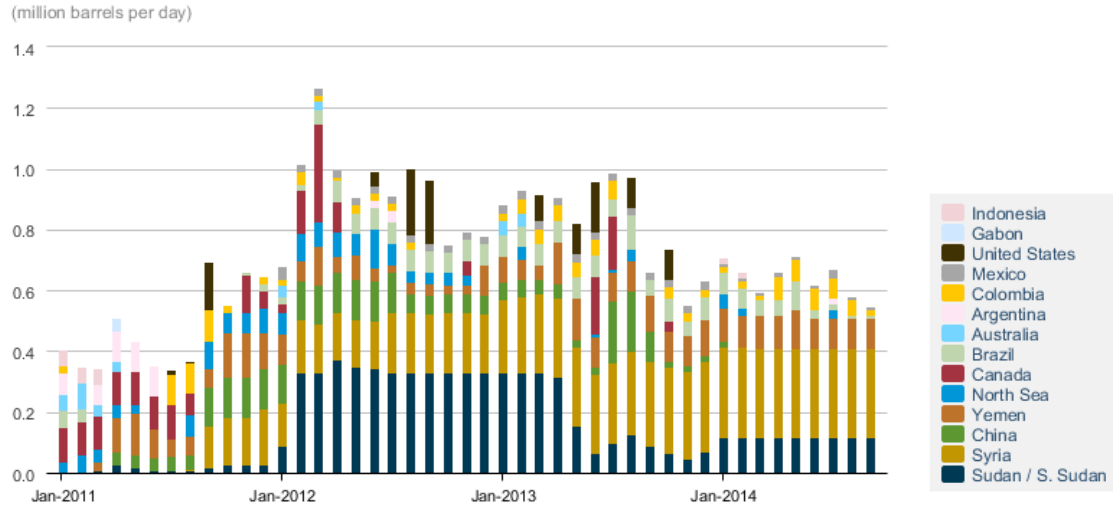

Figure 2. Unplanned Outages in Non-OPEC Nations (Source: EIA)

[1] See *Iraq through the Lens of Energy* released on October 3, 2014: http://1.usa.gov/1CNV0AZ.
[2] EIA, Short-Term Energy Outlook: http://www.eia.gov/forecasts/steo/report/global_oil.cfm.

Iraq (OPEC)

Unplanned outages in Iraqi production, predominantly in the north, began steadily increasing in late 2012 and early 2013, and spiked in the months before the fall of Mosul to ISIS forces in June 2014. The International Energy Agency notes:

> "While the oil hub of Basra remains insulated from Islamic State militants for now, the insurgents' violent campaign has taken a toll on production in northern Iraq. The jihadists have turned the refinery at Baiji, Iraq's largest facility, into a battleground – forcing it off line and sharply reducing output by closing the major domestic outlet for crude from the giant Kirkuk field and its satellites."[3]

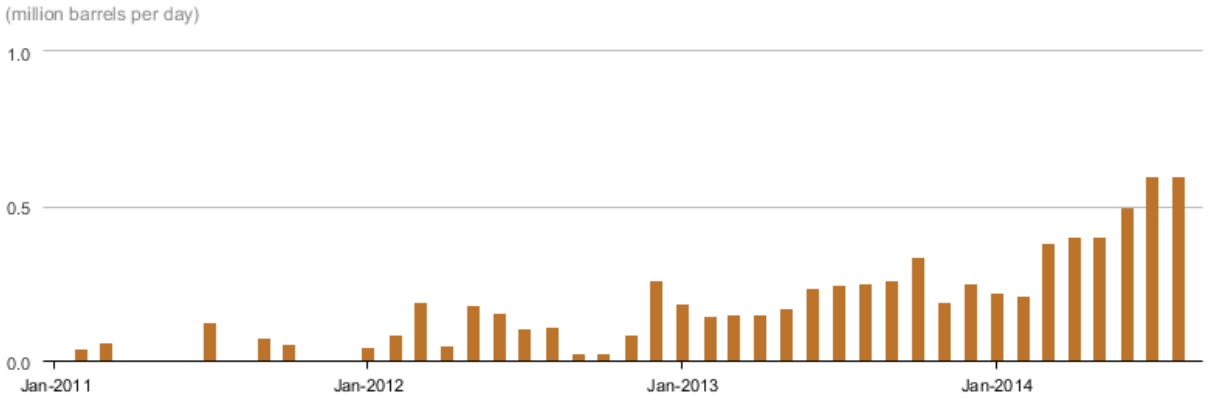

Figure 3. Unplanned Outages in Iraq (Source: EIA)

Iraq exports well over 70 percent of its oil production. When export routes are threatened – by repeated bombings of the northern Kirkuk-Ceyhan pipeline, for example – then production falls accordingly. The south has also faced labor-related unrest, although has been largely immune from the conflict with ISIS, and relies on port infrastructure for exports from that region. The Iraqi government derives over 90 percent of its revenue from oil sales.[4]

[3] IEA, Oil Market Report (October 14, 2014), p. 18.
[4] IMF Country Report No. 13/218 (July 2013): http://www.imf.org/external/pubs/ft/scr/2013/cr13218.pdf, p. 11.

Libya (OPEC)

The most obvious cause of unplanned outages in Libyan petroleum production was the civil war of 2011, which saw the forces of Muammar Qaddafi fighting an array of rebels for control of oil fields and ports. Production resumed remarkably quickly after the dictator's fall, which buoyed the prospects for economic growth and renewed stability in the country. Beginning in mid-2013, however, the security situation once again began to deteriorate. The EIA notes:

> "Libya is currently going through another crisis that has crippled its oil sector. What began as labor-related protests for higher salaries and better work conditions has evolved into more politicized issues such as regional autonomy and allegations of corruption."[5]

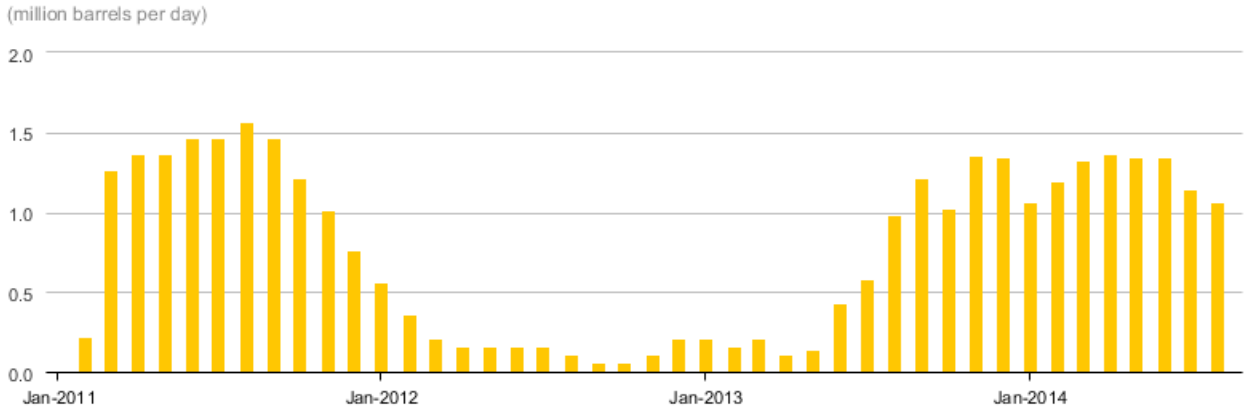

Figure 4. Unplanned Outages in Libya (Source: EIA)

Further, the IEA notes:

> "Libya's production recovery continues apace even as the country descends further into chaos…Highlighting the fragility of the North African producer's comeback, output slipped back below 900 kb/d in early October [2014] due to a protest at the Sirte oil company by local residents demanding jobs. And in mid-September, the El Sharara oil field in the southwest of the country was closed for nearly a week after fierce fighting near Tripoli led NOC to close the Zawiya export terminal and refinery, which are both linked to El Sharara, Libya's biggest oil field."[6]

Production has, paradoxically, continued to grow despite the increased instability. The Libyan government depends on oil and gas for 96 percent of its revenue.[7]

[5] EIA, Libya Country Analysis Brief (October 10, 2013): http://www.eia.gov/countries/cab.cfm?fips=LY.
[6] IEA, OMR (October 14, 2014), pp. 18-19.
[7] IMF Country Report No. 13/150 (May 2013): http://www.imf.org/external/pubs/ft/scr/2013/cr13150.pdf. p. 4.

Yemen (Non-OPEC)

Yemeni oil and gas production has been on the receiving end of militant attacks for years. This has included the nation's LNG export facility, as well as various pipelines. The EIA notes:

> "The combination of declining production in its mature fields and frequent attacks on its energy infrastructure has left Yemen's oil sector in poor shape. In 2013, there were at least 10 attacks on Yemen's oil and natural gas pipeline system, and some industry sources estimate closer to 24 attacks. In 2012, there were more than 15 attacks, and oil exports were completely offline for most of the first half of the year."[8]

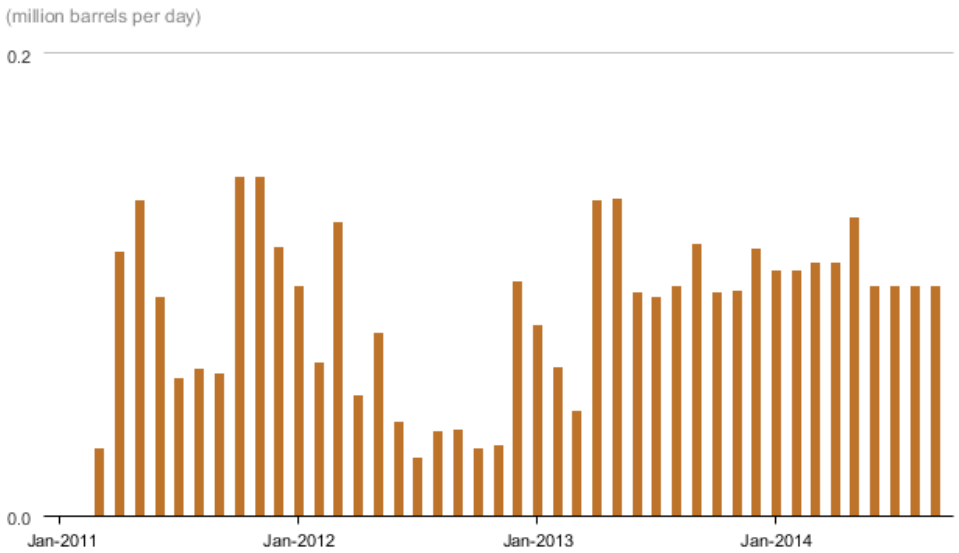

Figure 5. Unplanned Outages in Yemen (Source: EIA)

The Congressional Research Service notes:

> "[T]here are hundreds of non-governmental groups (tribes, separatists, terrorists) who are able to sabotage the country's energy infrastructure in order to extract concessions from either the government or foreign investors. For example, independent tribes periodically attack oil and natural gas pipelines in order to pressure the central government to provide jobs to tribesmen, settle land disputes, or free relatives from prison."[9]

The Yemeni government depends on oil and gas for some 50 percent of its revenues.[10]

[8] EIA, Yemen Country Analysis Brief (September 25, 2014): http://www.eia.gov/countries/cab.cfm?fips=YM.
[9] Jeremy M. Sharp, "Yemen: Sabotage of Oil Infrastructure and Domestic Politics," CRS (October 16, 2014).
[10] IMF Country Report No 13./246 (July 2013): http://www.imf.org/external/pubs/ft/scr/2013/cr13246.pdf, p. 25.

Sudan/South Sudan (Non-OPEC)

Within months of South Sudan's independence from Sudan in July 2011, unplanned production outages in the two joined nations began increasing rapidly. These levels have remained elevated ever since. The EIA notes:

> "Most of the oil production capacity is now in South Sudan, but the country is landlocked and remains dependent on Sudan because it must use Sudan's export pipelines and port. Disagreements over oil revenue sharing and armed conflict have curtailed oil production from both countries over the past few years."[11]

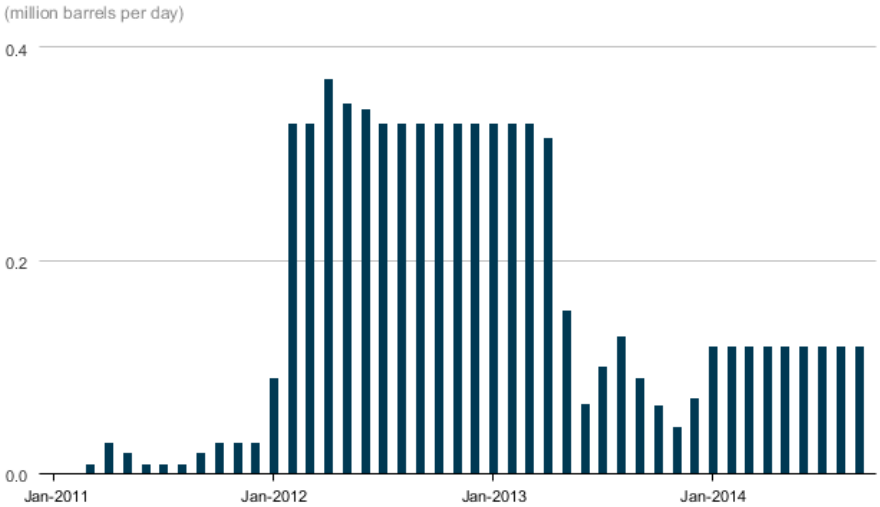

Figure 6. Unplanned Outages in Sudan/South Sudan (Source: EIA)

The Congressional Research Service notes:

> "South Sudan's active oil fields are located in Unity and Upper Nile states, which have been among the areas worst affected by fighting since the conflict in South Sudan began in December 2013…The fields in Unity were shut when oil workers evacuated in December, and have remained closed. Upper Nile production has continued, but is down….Fighting near the field since September threatens this production."[12]

The South Sudanese government depends on oil for some 97 percent of its revenue.[13] The Sudanese government depends on oil for approximately 11 percent of its revenue.[14]

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[11] EIA, Sudan and South Sudan Country Analysis Brief (September 3, 2014): http://www.eia.gov/countries/cab.cfm?fips=su.

[12] Lauren Ploch Blanchard, "The Role of Oil Resources in the South Sudan Conflict," CRS (October 15, 2014).

[13] World Bank, Report No. 74767-SS Interim Strategy Note (January 30, 2013): http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/02/07/000333037_20130207110223/Rendered/PDF/747670ISN0P1290Official0Use0Only090.pdf, p. 8.

[14] IMF Country Report No. 14/249 (August 2014): http://www.imf.org/external/pubs/ft/scr/2014/cr14249.pdf, pp. 25.

Nigeria (OPEC)

The petroleum sector in Nigeria suffers from maintenance problems, theft, and vandalism. The EIA notes:

> "The oil and natural gas industries are primarily located in the Niger Delta region, where it has been a source of conflict. Local groups seeking a share of the wealth often attack the oil infrastructure, forcing companies to declare force majeure…on oil shipments. At the same time, oil theft, commonly referred to as 'bunkering,' leads to pipeline damage that is often severe, causing loss of production, pollution, and forcing companies to shut in production."[15]

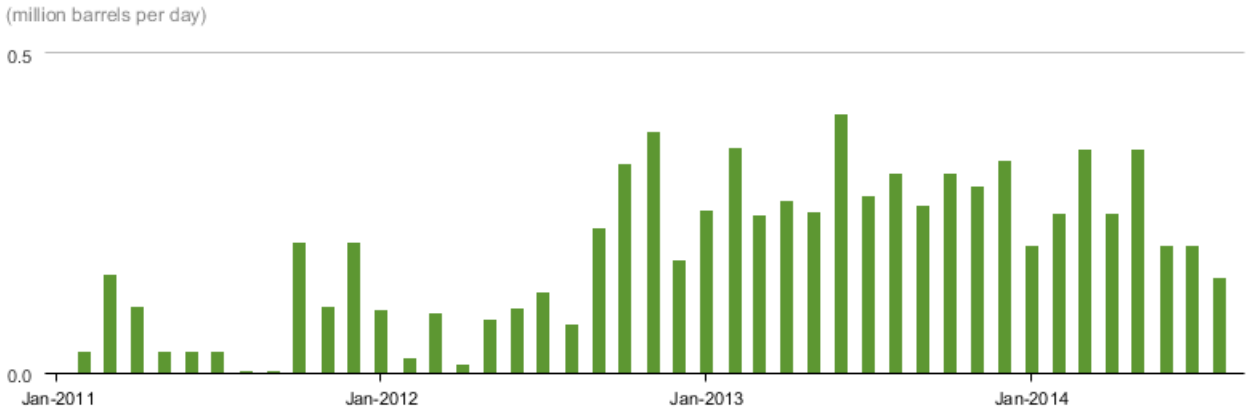

Figure 7. Unplanned Outages in Nigeria (Source: EIA)

Outages increased markedly beginning in late 2012 as multiple pipelines were shut-in. At the same time, militants in the north – relatively far from the petroleum centers in the south – have grown increasingly active but, despite threats, have not struck oil infrastructure in the Niger Delta. The State Department notes:

> "The terrorist group Boko Haram (BH), and a splinter group commonly known as Ansaru, carried out kidnappings, killings, bombings, and attacks on civilian and military targets in northern Nigeria, resulting in over one thousand deaths, injuries, and significant destruction of property in 2013."[16]

Unplanned disruptions could rise if Boko Haram or other militants attacked production facilities, pipelines, or export infrastructure successfully. The group did claim responsibility for an unsuccessful attack on a fuel depot in Lagos in June, potentially a harbinger of more strikes to come. The Nigerian government depends on oil and gas for some 65 percent of its revenue.[17]

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[15] EIA, Nigeria Country Analysis Brief (December 30, 2013): http://www.eia.gov/countries/cab.cfm?fips=ni.
[16] State Department, *Country Reports on Terrorism 2013* (April 2014): http://www.state.gov/documents/organization/225886.pdf, pp. 36-40.
[17] IMF Country Report No. 14/103 (April 2014): http://www.imf.org/external/pubs/ft/scr/2014/cr14103.pdf, p. 24.

Colombia (Non-OPEC)

The oil sector in Colombia has seen remarkable gains since 2008. However, the EIA notes:

> "Pipelines and other energy infrastructure in the country are still the targets of attacks by anti-government guerrillas. Pipeline attacks significantly declined from 155 in 2005 to 31 in 2010. However, beginning in 2011 there were 84 pipeline attacks and have been continually increasing since then, according to Colombia's Ministry of Defense. Between January and September of 2013, there were 147 attacks."[18]

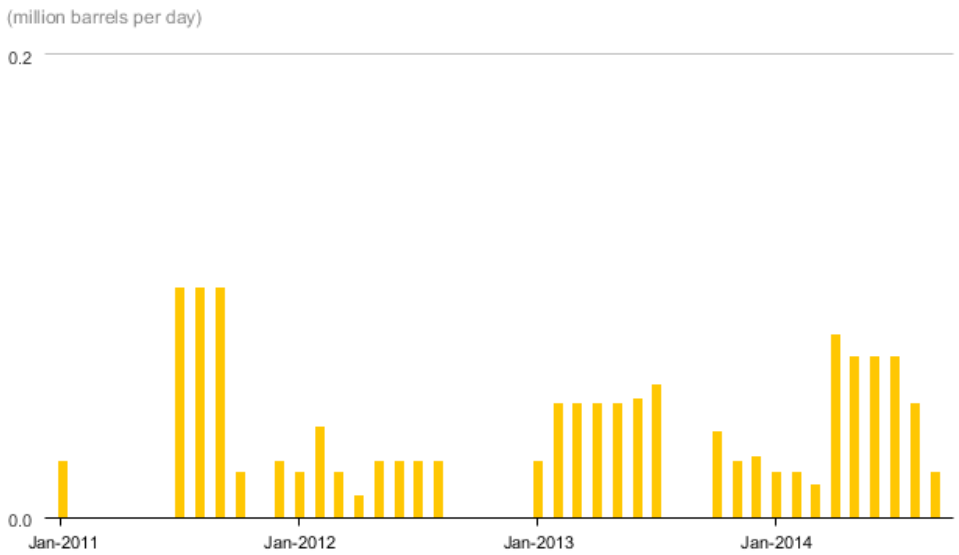

Figure 8. Unplanned Outages in Colombia (Source: EIA)

The Congressional Research Service notes:

> "The regulatory reform that resulted in increased foreign participation and ownership in the Colombian oil sector also put the policy at odds with the insurgent groups. As a result, attacks have occurred on oil facilities, including pipelines and tanker trucks, which bring Colombian oil to export ports on the Caribbean…[T]he fact that insurgents have operated in Colombia over the past 50 years under varying economic and political circumstances suggests that concern over the stability of oil production and exports may be justified, even in light of ongoing peace negotiations and improved labor practices."[19]

The Colombian government derives some 16 percent of its revenue from oil.[20]

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[18] EIA, Colombia Country Analysis Brief (January 7, 2014): http://www.eia.gov/countries/cab.cfm?fips=co.
[19] Robert Pirog, "Colombia Oil Production Disruption," CRS (October 16, 2014).
[20] IMF Country Report No. 14/141 (May 2014): https://www.imf.org/external/pubs/ft/scr/2014/cr14141.pdf, pp. 43, 45.

Iran (OPEC)

Petroleum production in Iran suffers chiefly from one external factor: international sanctions. The EIA notes:

> "International sanctions have stymied progress across Iran's energy sector, especially affecting upstream investment in both oil and natural gas projects. The sanctions have prompted a number of cancellations and delays of upstream projects, resulting in declining oil production capacity. The United States and the European Union (EU) enacted measures at the end of 2011 and during the summer of 2012 that have affected the Iranian energy sector more profoundly than any previously enacted sanctions."[21]

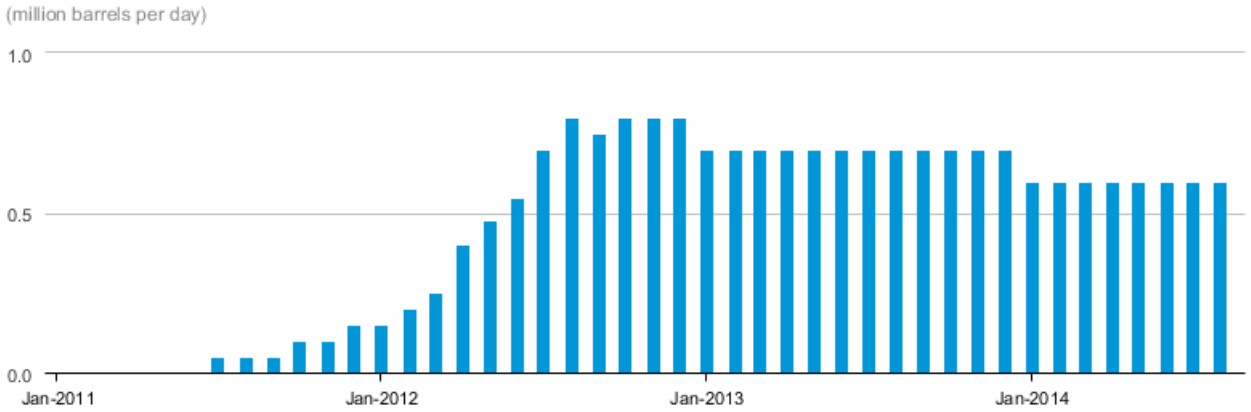

Figure 9. Unplanned Outages in Iran (Source: EIA)

The sanctions severely constrain the country's ability to export oil, which puts substantial downward pressure on its production. The EIA continues:

> "In recent years, a series of sanctions targeting the oil sector have resulted in cancellations of new projects by a number of foreign companies, while also affecting existing projects. Following the implementation of sanctions in late-2011 and mid-2012, Iranian production dropped dramatically. Although Iran had been subject to four earlier rounds of United Nations sanctions, the much tougher measures imposed by the United States and the EU have severely hampered Iran's ability to export its oil, which affected Iran's oil production."

According to the EIA, these sanctions "inhibit the country's ability to carry out investment projects that are necessary to offset natural decline in production from existing wells."[22] The Iranian government depends on oil revenue for some 45% of its operating budget.[23]

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[21] EIA, Iran Country Analysis Brief (July 22, 2014): http://www.eia.gov/countries/cab.cfm?fips=ir.

[22] EIA, *Short-Term Energy Outlook Supplement: Uncertainties in the Short-Term Global Petroleum and Other Liquids Supply Forecast* (February 2014): http://www.eia.gov/forecasts/steo/special/pdf/2014_sp_01.pdf, p. 3.

[23] IMF Country Report No. 14/93 (April 2014): http://www.imf.org/external/pubs/ft/scr/2014/cr1493.pdf, p. 36.

Syria (Non-OPEC)

Syria has never been a major oil producer, but the civil war and international sanctions have left its petroleum sector virtually non-existent. The EIA notes:

> "Syria's oil sector has been in a state of disarray since 2011. Production and exports of crude oil have fallen to nearly zero, and the country is facing supply shortages for some refined products…Syrian oil production is at a virtual standstill, and the lack of crude oil has led to the country's refineries operating at lower than normal capacities. This resulted in supply shortages for some refined products. Further, sanctions—and the resulting loss of oil export revenues—make importing petroleum products difficult. Oil theft is also a problem, with Syrian officials claiming that hundreds, possibly thousands, of barrels of crude oil are being stolen and shipped to neighboring countries each day."[24]

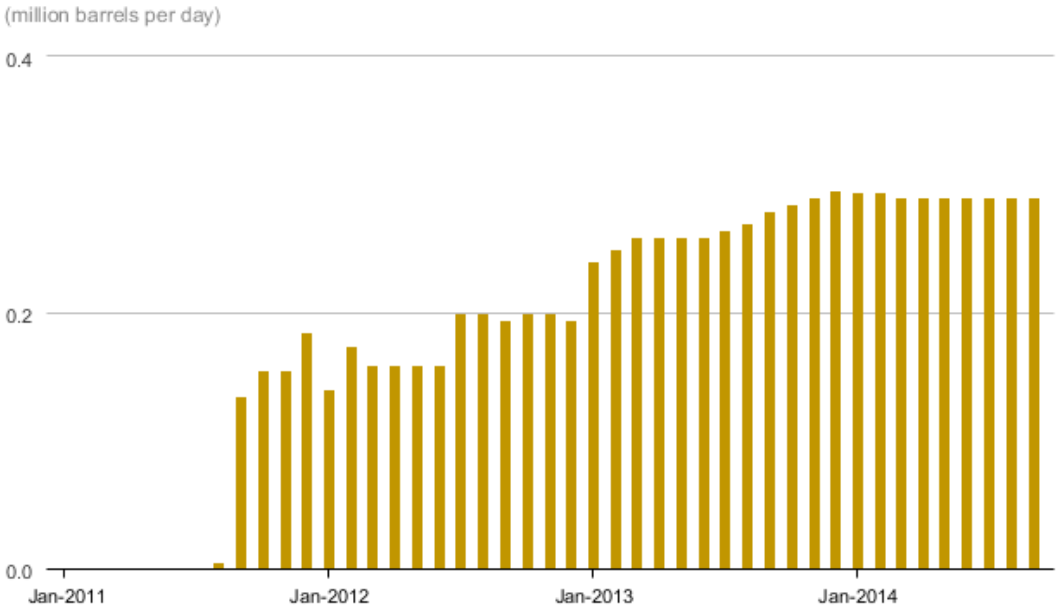

Figure 10. Unplanned Outages in Syria (Source: EIA)

The IEA, meanwhile, notes:

> "In Syria, the [ISIS] militants continue to control the Deir Az-Zour oil region, which includes the Omar field, Syria's largest."[25]

In 2009, the Syrian government derived some 20 percent of its revenue from oil.[26]

[24] EIA, Syria Country Analysis Brief (February 18, 2014): http://www.eia.gov/countries/cab.cfm?fips=sy.
[25] IEA, OMR (October 14, 2014), p. 21.
[26] IMF Country Report No. 10/86 (March 2010): http://www.imf.org/external/pubs/ft/scr/2010/cr1086.pdf, p. 40.

Conclusion

Unplanned petroleum production outages, which rose steadily in Iraq before ISIS seized Mosul in June 2014, are occurring in many other countries around the world. Many of these outages reflect rising or persistent violence in Iraq, Yemen, Libya, and South Sudan, and enduring challenges in Nigeria and Colombia. In the special cases of Iran and Syria, these outages illustrate the knock-on effects of international sanctions. These unplanned outages are not due solely to violence and instability, and can instead reflect natural disasters, production difficulties, and other more benign causes. But in many cases, unplanned outages reflect growing or at least ongoing turmoil.

The analytical utility of tracking outages lies not in prediction but in strategic warning. After all, when outages are the direct result of attacks on oil infrastructure they cannot be used to predict those same attacks in retrospect, nor would we expect outage data from the previous month to provide a specific warning of timing or imminent attack. Oil outages can, however, alert observers to take careful notice, especially when considered alongside the many other indicators of instability that are available. In some cases, it is possible that turmoil would not be reflected in outage data at all, particularly if the relative importance of oil infrastructure to a particular country ensured that it received the most protection from ongoing violence or if oil infrastructure was located in a safer region of the country. Finally, many of the countries surveyed herein are largely or almost entirely dependent on oil revenues, which, if lost, may cause or exacerbate political instability and hinder a government's ability to establish security.

The impact on global markets of outages is dependent largely on their scale and duration. Sustained levels of such outages in other countries may constitute a degree of strategic warning to policymakers that attention is required, and ultimately are a reminder that record-breaking increases in North American oil production can enhance national security and stabilize global markets.

Acknowledgments

Staff wish to thank the Congressional Research Service for its assistance with this report. The cover image – of a dust storm over Libya and the Mediterranean Sea – was released on April 2, 2013, by NASA.[27]

[27] Photo taken on March 20, 2013: http://earthobservatory.nasa.gov/IOTD/view.php?id=80799&src=ve.