



## Short-Term Energy Outlook Supplement: EIA Estimates of Crude Oil and Liquid Fuels Supply Disruptions

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Unplanned [crude oil](#) and [liquid fuels](#) supply disruptions may occur frequently in many countries and for a variety of reasons, including conflicts, natural disasters, and technical difficulties. Although crude oil and liquid fuels supply disruptions may occur at any time, recent outages have particularly unsettled the world market. Total outages among the Organization of the Petroleum Exporting Countries (OPEC) and non-OPEC producers recently rose to historically high levels. These outages, combined with relatively low surplus production capacity, have contributed to a tighter world oil market during the third quarter of 2013.

In August, estimated unplanned disruptions among OPEC and non-OPEC producers reached 2.7 million barrels per day (bbl/d), the highest level since at least January 2011 (Figure 1). Of this volume, 0.6 million bbl/d was attributable to non-OPEC producers, while OPEC producers accounted for the remaining 2.1 million bbl/d of outages. Unplanned OPEC crude oil production disruptions were at their highest level since the U.S. Energy Information Administration (EIA) began tracking OPEC disruptions in January 2009.

Charts of estimated monthly OPEC and non-OPEC unplanned production outages will be available each month in the *Short-Term Energy Outlook* chart gallery:

<http://www.eia.gov/forecasts/steo/data.cfm?type=figures>

The Excel version of each chart will include a table of monthly country-level unplanned outage estimates.

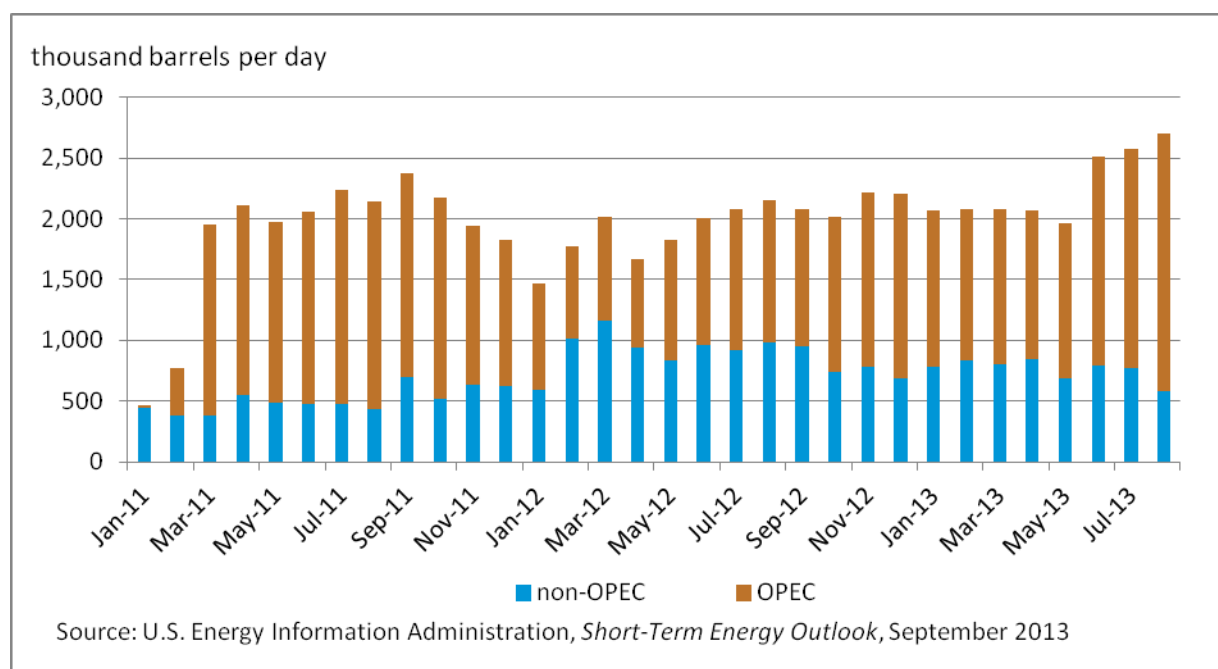
EIA's assessment of unplanned disruptions is based on a country-by-country analysis. The estimated outages account for crude oil only among OPEC producers and all liquid fuels among non-OPEC producers.

EIA's estimates of unplanned production outages are calculated as the difference between estimated effective production capacity (the level of supply that could be available within one year) and estimated production. These estimates of unplanned outages exclude normal maintenance and reflect the level of shut-in volumes compared with an assessment of effective production capacity for a given month. Therefore, these outage estimates can differ from those measured against other capacity types, such as nameplate capacity or the production level prior to the disruption. An analysis of changes in production

and exports reveals that effective production capacity is significantly lower than the nameplate capacity in many countries that are repeatedly subject to unplanned outages.

Four OPEC countries have had meaningful disruptions: Iran, Iraq, Libya, and Nigeria (Figure 2). These four OPEC countries are assumed not to hold surplus crude oil production capacity as other OPEC-member countries do. Non-OPEC outages are tracked across virtually all producers (Figure 3).

**Figure 1. Estimated unplanned OPEC crude oil and non-OPEC liquid fuels production outages, January 2011-August 2013.**



## OPEC Producers

**Iran.** Recent sanctions targeting Iran’s petroleum exports have had a particularly significant effect on its exports, which fell by about 1 million bbl/d in 2012 compared with the previous year. The lower exports were reflected in lower production, as the National Iranian Oil Company was forced to shut in production because of a lack of an export market and sufficient storage space in which to house unsold oil.

Sanctions on Iran have also led to a loss of effective production capacity. EIA believes that Iran’s effective crude oil production capacity has declined from 3.8 million bbl/d in January 2009 to approximately 3.4 million bbl/d in August 2013. The decrease in effective production capacity reflects the degrading of some of Iran’s oilfields that have been shut in. In addition, the loss of Iranian export revenues and the lack of foreign investment under sanctions have precluded efforts to offset the natural decline rates in Iran’s operating oilfields. Although Iran’s nameplate capacity is significantly higher, EIA does not believe that it is an accurate representation of Iran’s oil production potential.

Although EIA estimates Iran's effective crude oil production capacity at 3.4 million bbl/d as of August 2013, Iran's estimated production that month was only 2.8 million bbl/d. These estimates imply an unplanned outage volume of roughly 600,000 bbl/d in August.

**Iraq.** Overall Iraqi production has been rising since 2003 despite continuing disruptions that have reduced exports in different parts of the country. Therefore, Iraq's unplanned disruptions cannot be estimated by looking at trends in its overall production level. Outages in Iraq were considered in the context of geography: outages in the north of the country were estimated using a separate methodology from those in the south of the country, reflecting differing issues facing these areas. Estimates of outages in the north were based on crude oil exports through the Kirkuk-Ceyhan pipeline to the Turkish port of Ceyhan, while those in the south were based on crude oil exports from Basrah and Khor Al-Amaya. Combined outages for August were estimated at 250,000 bbl/d, all resulting from a seasonally atypical shortfall in the north.

Iraqi exports from the southern ports of Basra and Khor Al-Amaya have been trending upwards since 2009 with the expansion of offshore loading capacity. Most disruptions for these Persian Gulf ports are weather-related. Disruptions are estimated by comparing a statistically estimated trend (adjusted for seasonality) with actual loadings data. Sharp downward deviations from this trend are flagged as likely disruptions.

Iraqi crude oil exports to the north flow via the Iraq-Turkey pipeline to the Turkish port of Ceyhan. Exports via this route are limited by infrastructure constraints. Although this route consists of two parallel pipelines with a combined nameplate capacity of 1.65 million bbl/d, only one of the twin pipelines is fully operational, with a maximum available capacity of less than 600,000 bbl/d (the State Department has cited a lower capacity estimate of between 432,000 and 480,000 bbl/d). The Iraq-Turkey pipeline has been subject to repeated bombings. In addition, payment disputes between the Iraqi central government and the Kurdistan Regional Government (KRG) have often resulted in reduced oil flows through this pipeline. Estimating disruptions from normal flow levels is statistically difficult, as disruptions are so common that, in essence, disrupted flow levels are the norm. Sharp downward deviations below export levels of 400,000 bbl/d were flagged as likely disruptions, and matched with reported disruptions in the trade press and State Department reports.

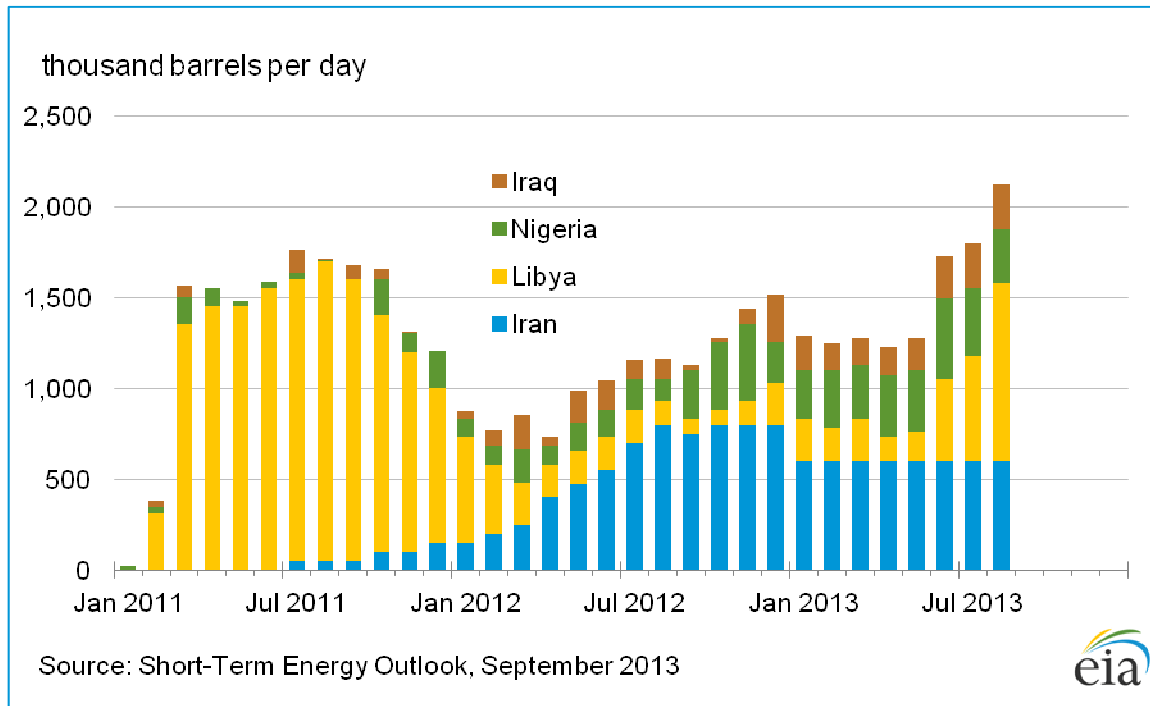
**Libya.** EIA estimates that in August almost 1.0 million bbl/d of crude oil was shut in that could technically be brought back on line within one year. Unplanned disruptions in Libya reached the highest level in August since the 2011 conflict because of the recent deterioration in the security environment and the closure of key oil exporting facilities, pipelines, and fields. The outage is based on an assessment of oil-related infrastructure, field-level estimates, and effective production capacity, which is estimated at slightly below 1.6 million bbl/d and is derived mainly from field-level estimates. The monthly average of seaborne exports is also taken into account.

**Nigeria.** In EIA's view, Nigeria's nameplate capacity significantly overstates its effective production capacity. The country's effective production capacity is based on an assessment of production that has been permanently shut in, or cannot be readily brought back on line, and historical production and export levels. Output levels of various crude streams, loading and export data, and news articles are

assessed to estimate Nigeria’s monthly production estimate. EIA believes that major investments in infrastructure and drilling and a significant improvement in the security situation in the Niger Delta, both requiring longer than one year to accomplish, would be necessary to return Nigeria’s production potential closer to its nameplate capacity.

EIA estimates Nigeria’s effective production capacity at approximately 2.32 million bbl/d and production at 2.03 million bbl/d, resulting in an average of 290,000 bbl/d of unplanned disruptions in August.

**Figure 2. Estimated unplanned OPEC crude oil production outages, January 2011-August 2013.**



## Non-OPEC Producers

**Sudan/South Sudan.** EIA’s assessment of unplanned outages in Sudan and South Sudan is based on a variety of sources, including trade press, government and company reports, and State Department cables. Volumes that are generally reported by field or on a project level are aggregated to derive total volumes for the two countries. The estimated outage volume of 170,000 bbl/d in August reflects the difference between estimated effective production capacity and current production volumes, about 445,000 bbl/d and 275,000 bbl/d, respectively. EIA estimates that Sudan and South Sudan’s effective production capacity decreased from about 470,000 bbl/d due to field damage in the aftermath of production shut-ins that occurred in early 2012, as well as natural declines at fields in Sudan. The current lower assessment of effective production capacity reflects volumes that could technically come back online within one year.

**Syria.** Sanctions targeting Syria’s petroleum exports have had a particularly significant effect, leading to practically zero exports in 2012. Lower exports directly translated into lower production. EIA believes

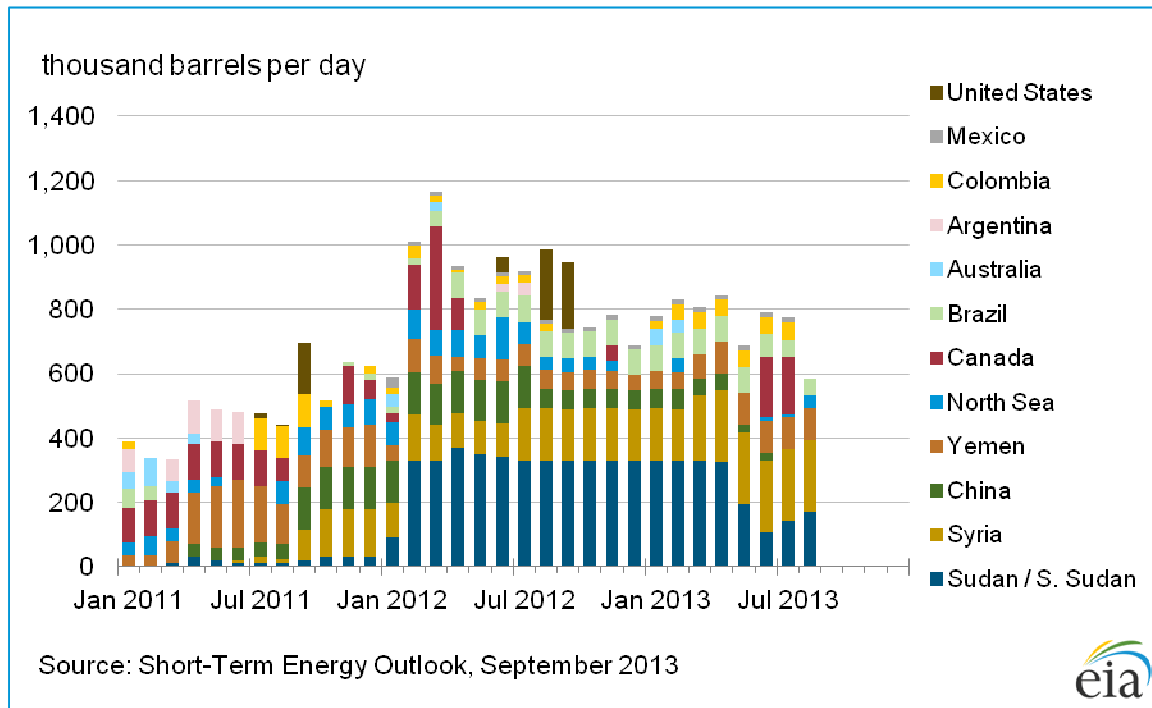
that Syria's effective capacity has decreased from 410,000 bbl/d in January 2009 to approximately 320,000 bbl/d in August 2013. The decrease in effective capacity reflects the damage to oil reservoirs and fields. EIA's assessment is derived from various trade press reports on Syria's production as well as an assessment of exports based on tanker loading data (as reported by Lloyd's Analysis of Petroleum Exports (APEX) database). Although its production capacity was 320,000 bbl/d in August, Syria only produced 100,000 bbl/d. Therefore, EIA estimates that Syria's outage volume totaled 220,000 bbl/d in August.

**Yemen.** The security environment in Yemen has resulted in decreases in both effective capacity and total production, particularly since 2010. EIA estimates that Yemen's effective production capacity has decreased to 220,000 bbl/d from 350,000 bbl/d in 2010. Yemen's total production in August was approximately 120,000 bbl/d, reflecting continued unrest and the repeated disruptions to the Marib-Ras Isa Pipeline, Yemen's main export pipeline, which carries oil from the Marib province to the Ras Isa oil export terminal on the Red Sea. Based on these estimates, Yemen's disrupted volume in August totaled 100,000 bbl/d. EIA's assessment of outages in Yemen is based on trade press, State Department cables, and export data as reported by the APEX database.

**Brazil and North Sea.** Unlike most areas that are experiencing disruptions because of political instability, outages in Brazil and the North Sea are the result of technical difficulties and weather-related events. The assessments of outages in these areas are based on company and government statistics, which are generally reported by field or at a project level.

In Brazil, a 50,000-bbl/d outage is mainly the result of a continued production shut in at the Frade field, which was completely shut in following a November 2011 oil spill and subsequent oil leaks. An estimated 40,000 bbl/d average outage in the North Sea for August 2013 mainly stems from production outages at the Buzzard field.

Figure 3. Estimated unplanned non-OPEC liquid fuels production outages, January 2011-August 2013.



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