



Attacks on Saudi Oil Facilities: Effects and Responses

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September 14, 2019, saw an attack on [Saudi Aramco's](#), [Saudi Arabia's](#) national oil company, Abqaiq oil processing facility and Khurais oil field and processing plant. The attack, which used both missiles and drones, temporarily disrupted 5.7 million barrels per day (mb/d) of oil production, over half of Saudi Arabia's oil production and about 5% of global supply. For context, U.S. crude oil production is approximately 12 mb/d.

Abqaiq Facility

[Abqaiq](#) is a key processing facility for Saudi Arabia crude. Two important functions provided by Abqaiq include (1) crude oil stabilization, a process that removes hydrogen sulfide and reduces the volatility of crude oil to specifications required for shipping, and (2) gas oil separation, where oil is separated from other hydrocarbons such as methane, butane, and propane. The Abqaiq facility was [reportedly operating at about 4.9 mb/d](#) prior to the attack and has a maximum capacity of [7 mb/d](#). According to Bloomberg, Abqaiq suffered five strikes on crude-stabilization towers and another 11 strikes on infrastructure that separates gaseous hydrocarbons from crude oil.

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Khurais Field and Facility

The [Khurais](#) field has a production capacity of 1.5 mb/d under normal circumstances. All oil from the Khurais field is processed on site. Khurais processing infrastructure suffered damage to four crude-stabilization towers, with differing degrees of damage.

Restoration Efforts

Saudi Aramco is working to replace the disrupted supply and restore production capacity. [Reportedly](#), Aramco is utilizing oil from storage to meet current export commitments as well as spare capacity not affected by the attacks. Increased production from offshore fields with heavier and higher sulfur crude oil are also being used. Prince Abdulaziz bin Salman, the Saudi energy minister, announced the country would produce [11 mb/d](#) by September 30 (an amount higher than the pre-attack level of 9.8 mb/d,) and then increase to [12 mb/d](#) by November 30. [Some Saudi](#) officials believe restoring production will take longer. [Reportedly](#), Khurais restored 30% of production within 24 hours of the attack.

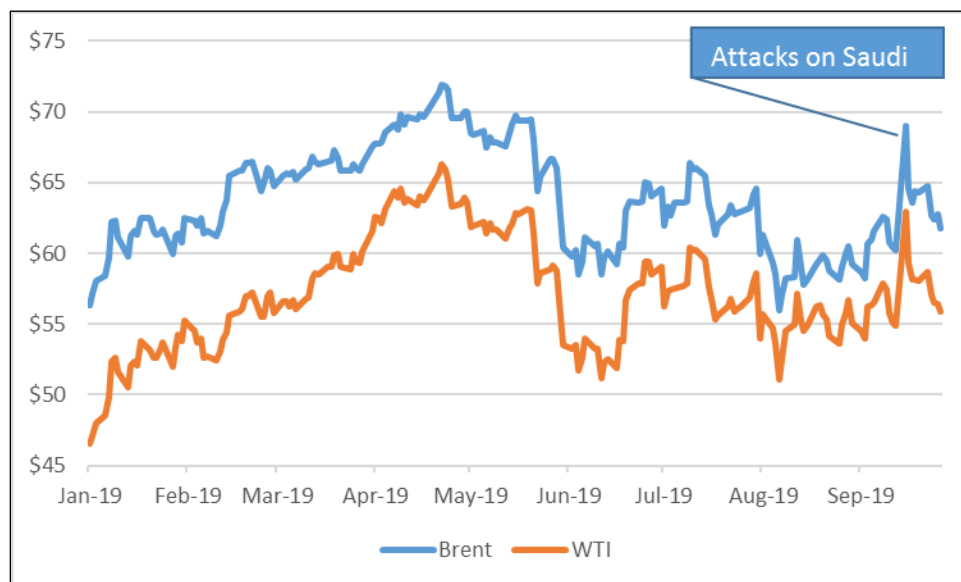
Typically, Saudi Arabia has been known to keep about 1.5 mb/d to 2.0 mb/d of spare capacity, traditionally the majority of OPEC spare capacity. Spare production capacity, as defined by the U.S. Energy Information Administration (EIA), is production that can be brought online within 30 days and sustained for 90 days. Since the September 2019 attacks, Iran may now be OPEC's majority holder of spare capacity, an unintended consequence of U.S. sanction on Iran. The International Energy Agency (IEA), founded to coordinate member responses to major oil disruptions, has not announced any plans to coordinate a release of oil strategic supplies (crude or petroleum products) from member countries (which includes the United States), but according to [a press release](#) from September 14, it is monitoring the situation closely.

Prices

Crude oil markets responded to the September 2019 attacks with an initial price rise (see **Figure 1**). The price of the U.S. benchmark crude, West Texas Intermediate (WTI), on Friday before the attacks was \$54.80 per barrel, while the international benchmark, known as Brent, was \$60.22. At the market's close on September 16, WTI was priced at \$62.67 and Brent was \$69.02, a roughly 14% increase for both. [EIA analysis](#) indicates that this was the largest single-day price increase for both price benchmarks over the last decade. As of September 27, benchmark oil prices are still above pre-attack levels by \$1.04 and \$1.58, respectively.

Figure I. Brent and WTI Prices

Close of Day (US\$ per Barrel)



Source: Bloomberg L.P.

Implications for Saudi Arabia and Saudi-U.S. Relations

Saudi and U.S. officials have downplayed claims by Yemen's Houthi rebels that they carried out the [attacks](#), instead [attributing](#) responsibility to Iran. The strikes were the [latest](#) in a [series](#) of cross-border [attacks](#) on energy and transportation sites in the kingdom apparently linked to the ongoing war in Yemen and the Saudi-U.S. confrontation with Iran. The incidents have demonstrated the vulnerability of critical Saudi infrastructure to missile and drone attacks and raised complicated strategic [questions](#) for Saudi and U.S. policymakers concerning [responses](#) and future security needs. On September 20, U.S. officials [announced](#) plans to deploy additional U.S. military personnel to Saudi Arabia and speed military equipment deliveries to Gulf partners to bolster capabilities and deter further attacks. The U.S. government also [announced](#) additional sanctions against Iran's Central Bank and other entities. Iran's government [denies](#) U.S. and [Saudi charges](#) of responsibility and has pledged to [retaliate](#) for any future attacks on Iran. Saudi Arabia and Houthi officials have reached a [partial cease-fire](#) in the war in Yemen, after Houthi forces declared a unilateral cease-fire in the week after the September 14 attacks.

Saudi Arabia's military operations in Yemen have created demands on security and defense capabilities and have contributed to [fiscal pressures](#) facing the kingdom. Trends in oil prices prior to the September 2019 attack saw prices remain [below](#) the kingdom's budget targets. Saudi leaders [deny](#) reports that they may substantially delay a planned [initial public offering](#) of shares in [Aramco](#), which is intended to raise funding for economic reform efforts. However, [additional attacks](#), or delays in restoration efforts, could reduce investor confidence. Over time, oil export volumes, market prices, and security and reconstruction costs will determine the attacks' fiscal effects on the kingdom.

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