

IICEC Energy Market Newsletter

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1. Summary

Oil Market

- The current producer's group (OPEC and Russia) agreement to manage supply set a floor price for oil around \$50/b. For most of 2017, prices remained in the mid-\$50/b range. However, price gains beyond \$50/b tend to be offset by increased U.S. tight oil production causing a counterbalance to producer's group cuts.
- Brent oil prices fell more than 10% in the last week as high inventories and increased drilling activity in the United States fueled speculation about the effectiveness of OPEC's cuts.
- Unexpected builds in U.S. crude inventories due to increased imports and lower refinery runs coincided with substantial draws from gasoline stocks. Since the producers agreement came into effect in January, U.S. inventories increased by almost 50 mb.

Natural Gas & LNG

- New Pacific liquefied natural gas (LNG) supply, along with lower oil prices, caused Asian spot prices to fall throughout the middle of the year. However, unplanned outages and colder weather contributed to a price recovery since June 2016.
- Gazprom gas sales to Turkey and Europe fell in February. Excluding the former Soviet Union countries, Gazprom's sales to Turkey and Europe dropped to 582 million cubic meters per day in February, down by 34 million cubic meters per day from the January average.
- An apparent resolution of the EU-Gazprom anti-trust case, in addition to possible political developments in Europe and the United States, may lessen past concerns over excessive EU reliance on Russian gas and might reduce EU opposition to Nordstream II.

Economics

- The U.S., European and Asian economies remain positive, though possible protectionist policies in the U.S. and political uncertainty in Europe add to downside risk.

Geopolitics & Supply

- IEA data showed OPEC production to be 32.1 mb/d in January, representing 90% of compliance with coordinated cuts. Iraq and Iran did not appear to meet their targets, while both Saudi Arabia and Venezuela cut more than required. Saudi Arabia reported an increase in production for February compared to January.

Renewables

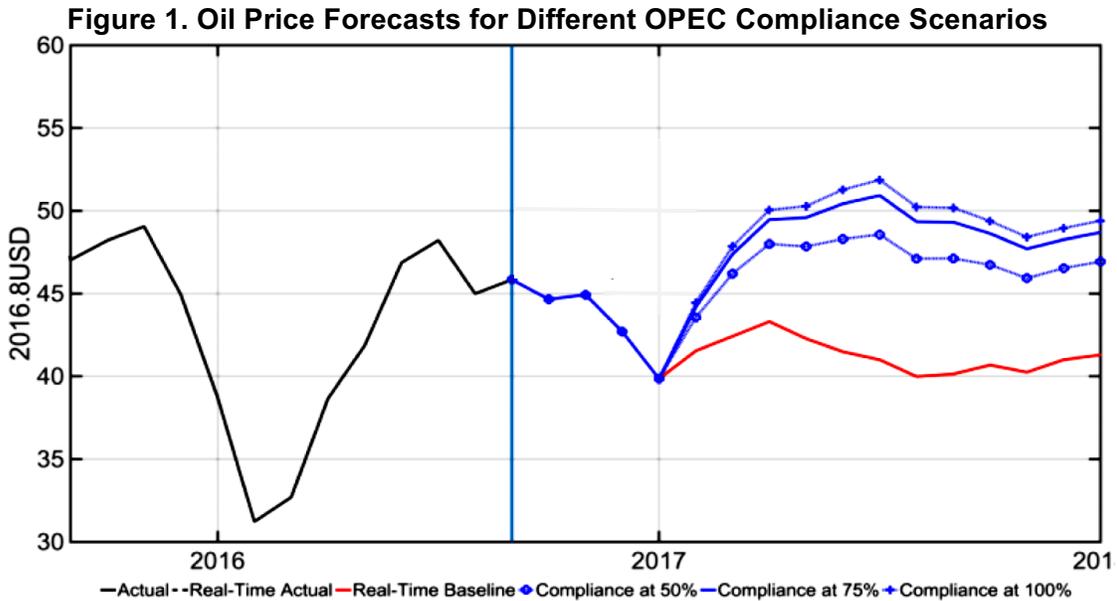
- Turkey has installed 571 MW of new solar PV capacity in 2016, making it the best year for the country's solar sector. 2017 is expected to be equally good, however there exist some uncertainties regarding future prospects. Overall, Turkey's total installed capacity has now reached 78.49 GW and the national target for solar PV technology is expected to reach 5 GW by 2023.
- The International Energy Agency (IEA) significantly increased its five-year growth forecast for renewables, due to strong policy support in the United States, China, India, and Mexico.

2. In the News: U.S. Tight Oil will respond to OPEC

The global oil market in 2017 will continue to be shaped by OPEC action but with less control over prices. Prices in the first three months of the year were heavily influenced by the producers group, led by OPEC and Russia, that agreed to coordinate on reducing production by up to 1.8 mb/d in the first half of the year. According to IEA estimates, OPEC compliance for January was 90%. The resulting price levels, however, are likely to continue to influence drilling activity in the United States, which is growing steadily (see Figure 4). U.S. drilling activity will respond quickly to price increases caused by OPEC actions that will likely limit their effectiveness.

Despite strong global oil demand growth in 2016, demand is expected to slow in 2017 and 2018. Average global oil demand growth increased by nearly 2 mb/d from 2015 to 2016, nearly double historical averages of 1 mb/d. Demand picked up toward the end of the year, with colder weather in Europe and increased industrial demand in Asia. Demand growth is expected to slow in the next few years due to the prospect of higher crude and product prices..

Non-OPEC crude production fell sharply in 2016 led by the decline of U.S. tight oil production, while global supply increased by 300 kb/d from 2015 due to higher OPEC output. Depending on the output levels from OPEC and Russia, there may be a reversal from 2016 - with U.S. output increasing and OPEC production decreasing. Global oil storage fell throughout 2016. Contango, the usual-shaped forward curve during 2016's oil commodity markets, is likely to switch to backwardation and increase the drawdown of oil from storage by the end of 2017.



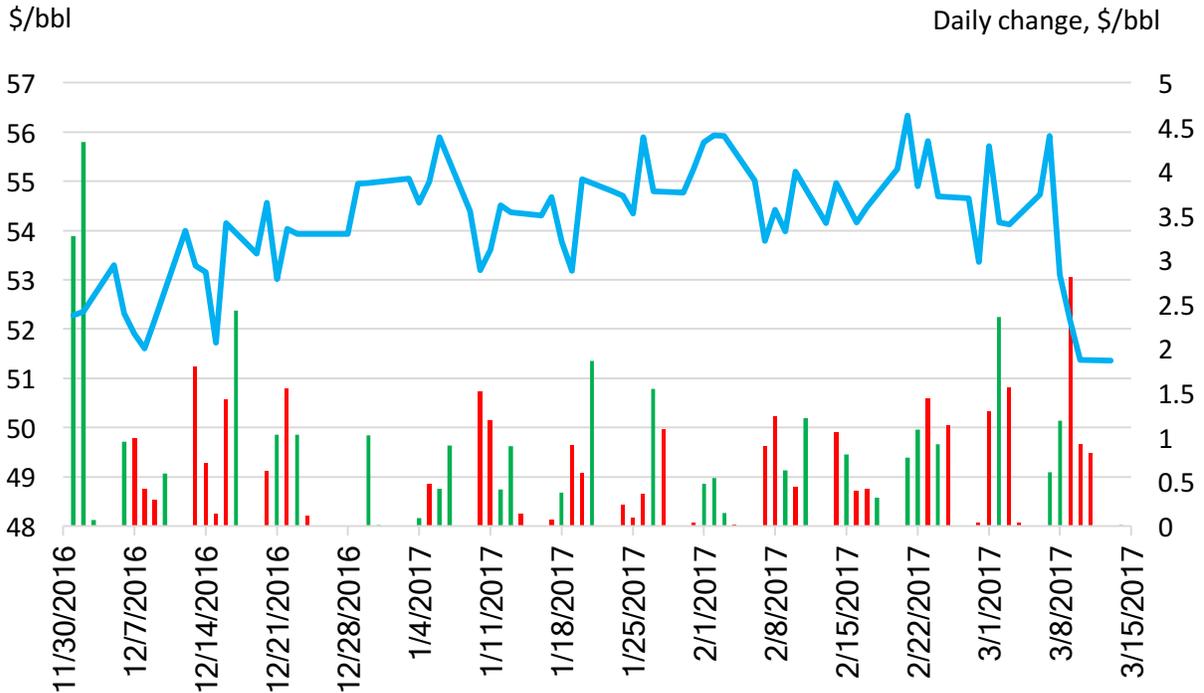
From Oxford Energy. Estimates are from measuring the effects of various levels of production cuts on real prices by a one-time structural endogenous supply shock.

3. Oil Market

Oil Supply and Prices

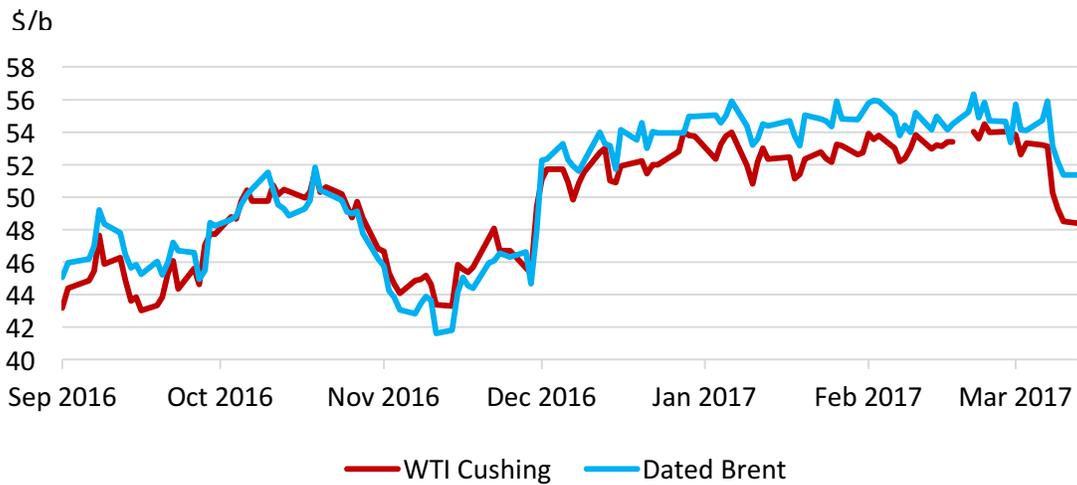
- **The Brent benchmark** oil price fell sharply this week as U.S. crude stocks continued to grow despite the OPEC and non-OPEC production freeze.

Figure 2. Brent Crude Oil Price since OPEC Announced Cut



- **The Brent-WTI spread** was \$1.90 on March 1 and has since widened to \$2.97 as of March 13. A widening Brent-WTI spread encourages U.S. drillers as export markets become more attractive.

Figure 3. Benchmark Crude Prices



- Turkey:** Pipelines in Turkey carried 500 mb of crude oil in 2016. According to data released by the Turkish Petroleum Pipeline Corporation (BOTAS), the figure was around 1.2% less compared to the previous year's 505.3 mb. Approximately 254 mb were transferred through the BTC in 2016, that makes up approximately 60% of the total crude oil transfers. Additionally, the Iraq-Turkey crude oil pipeline carried 190 mb (1.5% decrease compared to 2015). The smaller Ceyhan-Kirikkale and Batman-Dortyol crude oil pipelines transferred 35.3 mb and 20 mb respectively.ⁱ
- Azerbaijan:** In January-February 2017, 32.2 mb were exported via Baku-Tbilisi-Ceyhan crude oil pipeline, reflecting a 17.3% decrease relative to January and February of 2016ⁱⁱ. According to Azerbaijani government's annual report, this 17% fall in oil export is due to SOCAR's reduced oil and gas output.

Crude Storage

- U.S. crude inventories** increased by 8.2 mb last week to settle near 530 mb. This translates to a 50 mb total stock build since the start of the year. A resurgence in imports and decelerating refinery runs, which fell by 170 kb/d, contributed to the weekly stock build (see Figure 5).

Figure 4. U.S. Drilling Rig Count

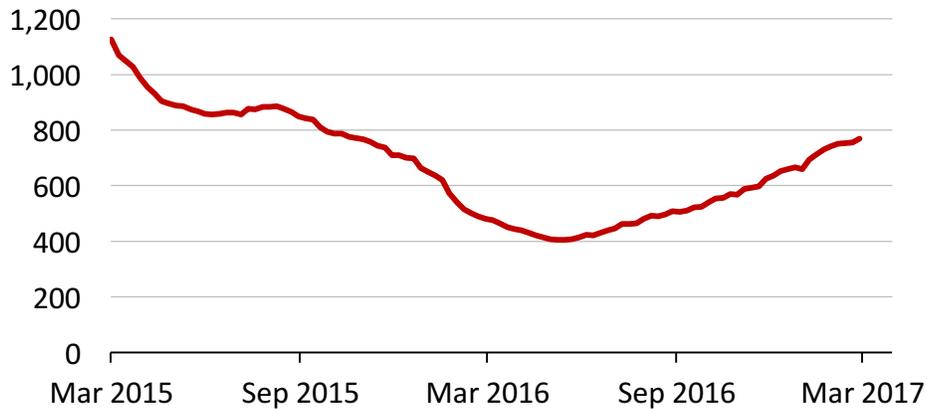
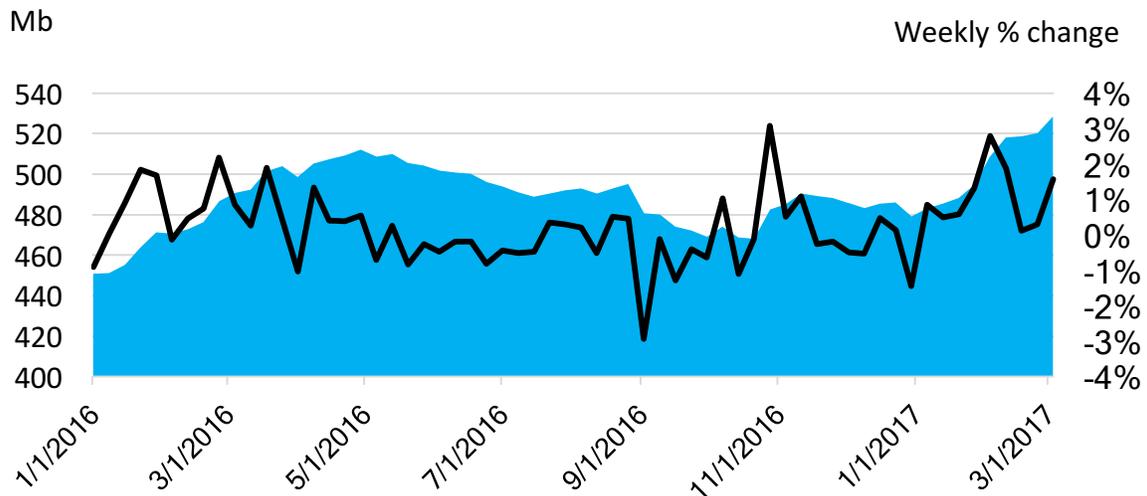


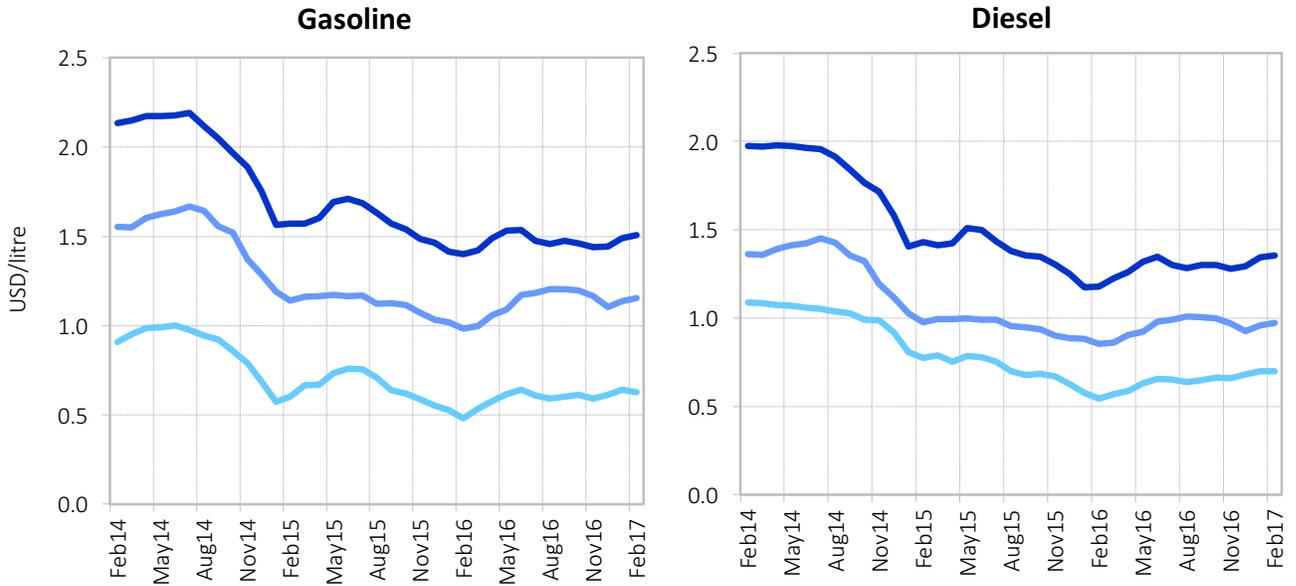
Figure 5. Weekly U.S. Crude Oil Stocks



Selected Product Markets

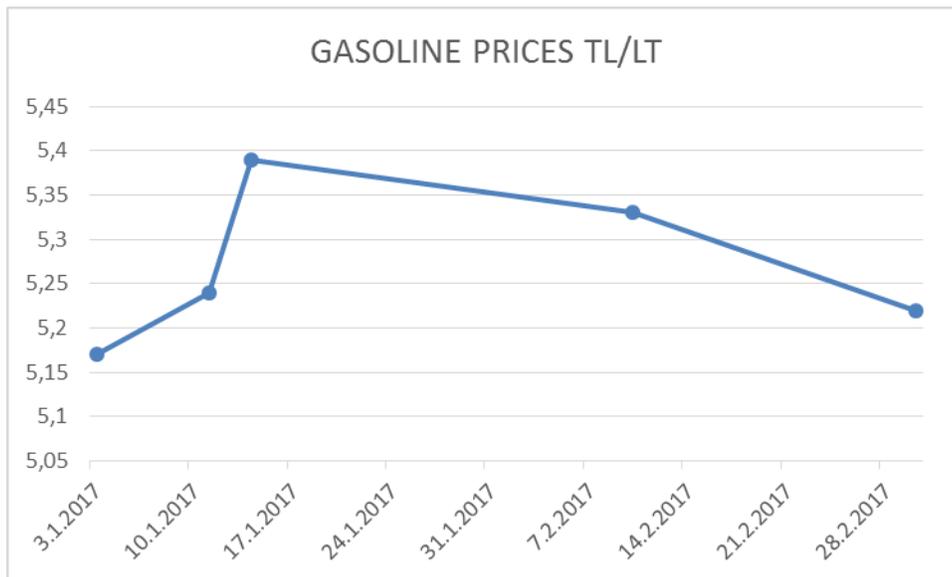
- **Regional product prices have mostly tracked crude prices since the end of December** (see Figure 6). Gasoline prices in the United States have increased since the end of the year, while European prices remained mostly flat. Gasoline stocks in the Amsterdam-Rotterdam-Antwerp (ARA) hub climbed nearly 6% to a seven-month high last week due to healthy refinery runs, in part due to increased utilization.

Figure 6. Select Product Prices in Europe, Japan, and North America



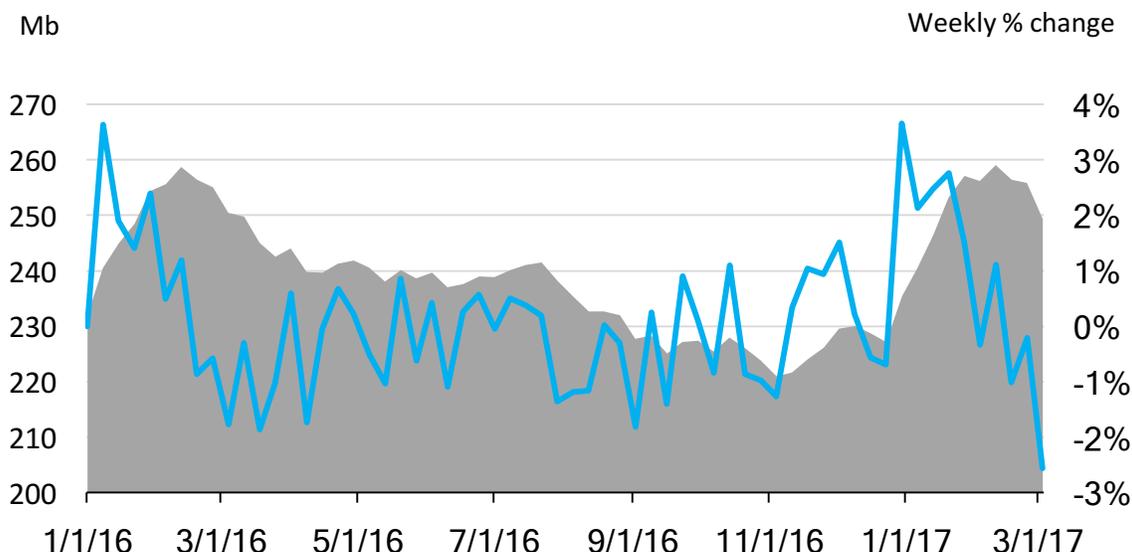
- **Turkish gasoline prices** are shown in Figure 9 reflecting movements in the \$/TL exchange rate. Gasoline prices decreased from 5.33 TL to 5.22 TL per liter last week.

Figure 7. Gasoline Prices Changes in Turkey



- **U.S. total gasoline stocks** last week experienced their largest drawdown since April 2011, with a 6.6 mb drop due to strong national demand and reduced refining output on the U.S. east coast (see Figure 8).

Figure 8. Weekly U.S. Gasoline Stocks and % Change



- **The regional middle distillate deficit for Europe, including Turkey, is estimated to be just over 1 mb/d in the first quarter of 2017**, rising to 1.1 mb/d in the second quarter as refinery maintenance curbs supply. Refinery turnarounds in Europe are forecast to peak in March, with just over 1.1 mb/d offline as part of more than 6.4 mb/d at facilities globally to be offline that month, according to Energy Aspects.ⁱⁱⁱ Demand in Europe, including Turkey, is forecast to be 6.8 mb/d in the first quarter, compared to 6.9 mb/d in the last three months of 2016, according to Energy Aspects. Demand will then fall to 6.7 mb/d in the second quarter.

4. Natural Gas & LNG

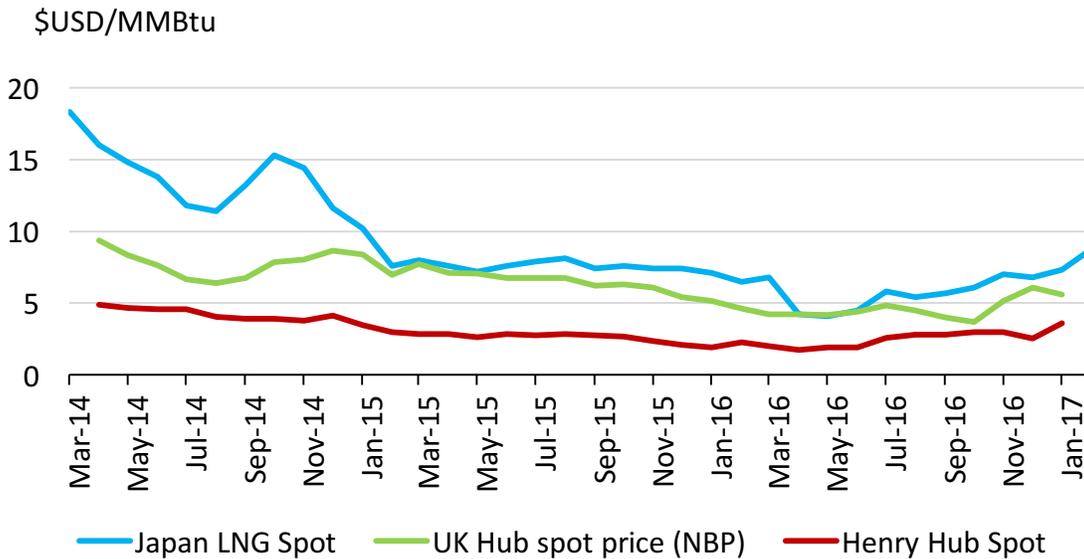
Natural Gas & LNG Supply and Prices

- **Gazprom Sales to Turkey and Europe fell in February.** Gazprom’s sales of natural gas to Turkey and Europe, excluding the former Soviet Union countries, dropped to 582 million cubic meters per day in February, down by 34 mcm/d from the January average.^{iv} Earlier this week, Gazprom announced that the company would increase its EU prices to \$180-190 per 1,000 cubic meters. Last year, the average price of Gazprom’s gas for Europe was \$167 per 1,000 cubic meters, the lowest in 12 years.
- **LNG imports of Turkey** are projected to surpass 9 million tons (MMT) by 2025 driven by increased use of natural gas in Turkey’s industrial sector for production of glass, ceramics, fertilizer, cement and steel, coupled with rising mining activity for chrome and copper.^v
- **Nord Stream II.** An apparent resolution of the EU-Gazprom anti-trust case, in addition to possible political developments in Europe and the United States, may lessen past concerns over excessive EU reliance on Russian gas and might reduce EU opposition to Nord Stream II. In Germany, regulators cleared Nord Stream II from restrictions by EU’s Third

Energy Package. Gazprom’s concessions to the EU include removing re-export restrictions from their supply contracts and pricing its gas in line with market forces. The European Commission is seeking additional views from affected Member Countries on Countries on Gazprom’s initiatives but inertia is moving in the direction of Nord Stream II’s approval.

- **New LNG supply in the Pacific Basin, as well as lower oil prices, contributed to Japanese spot prices falling at or below the National Balancing Point (NBP) in 2016.** U.S. Henry Hub prices remained measurably lower than prices in other regions, though did increase relative to other prices in the second half of the year. The FOB cost of U.S. LNG remained above NBP between January and October 2016, which discouraged the flow of U.S. LNG to Europe.
- **Prices began to increase at the end of the year, supported by project delays and winter demand.** As winter demand begins to recede and more supply comes online in both the Pacific and Atlantic Basins, it is likely that spot prices will begin to fall.

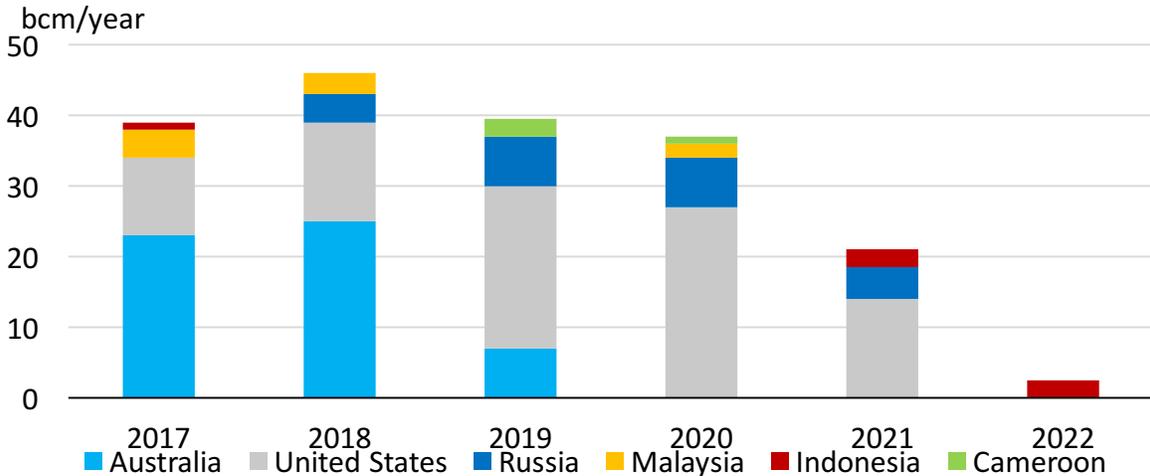
Figure 9. Select Natural Gas Prices



Gas Liquefaction Capacity

- **Turkey’s** Tuz Lake gas storage facility opened at the beginning of February in the Central Anatolian province of Aksaray. The underground facility is expected to increase capacity from 1.2 bcm to as much as 5 bcm. Consisting of 12 artificial caverns located 1,400 meters below the lake, each cavern operates with a capacity of 630,000 to 750,000 cubic meters of gas.^{vi} The cost of the project has been reported to be \$700 million. BOTAŞ and Chinese TTC began the drilling of the first 12 wells in 2012.
- **Major LNG production capacity additions are expected for the next few years** (Figure 10). Delayed growth of liquefaction capacity in 2016, due to various delays and start up malfunctions, will result in more concentrated growth in the next few years. Australia and the United States will continue to be the major source of new LNG production capacity.

Figure 10. Incremental Liquefaction Capacity Under Construction Year-on-Year



LNG Demand

- On the demand side, Asia regained its position as the driver of LNG demand growth in 2016, after a decline for the previous two years.** China, India, and Pakistan were the key demand markets, all responding to relatively low spot prices throughout 2016. Meanwhile, both new and existing markets in the Middle East accounted for the majority share of new trade routes in 2016. In 2017, Asia remains key for future demand growth while European markets are likely to be price-responsive to demand and the focus of flexible LNG supply.

5. Economics

United States: U.S. economic momentum has remained positive. Nonfarm payrolls expanded by 235,000 in February, exceeding market expectations. Job growth averaged 148,000 per month during the fourth quarter of 2016. In February, the number of jobs increased by 235,000, outperforming market expectations of a 190,000 increase. In its 3rd upward move since the financial crisis, the Fed, on March 15, raised U.S. interest rates by 25 basis points in recognition of a stronger U.S. economy. U.S. equities responded well to the news by climbing higher on the day the Fed announced its rate increase.

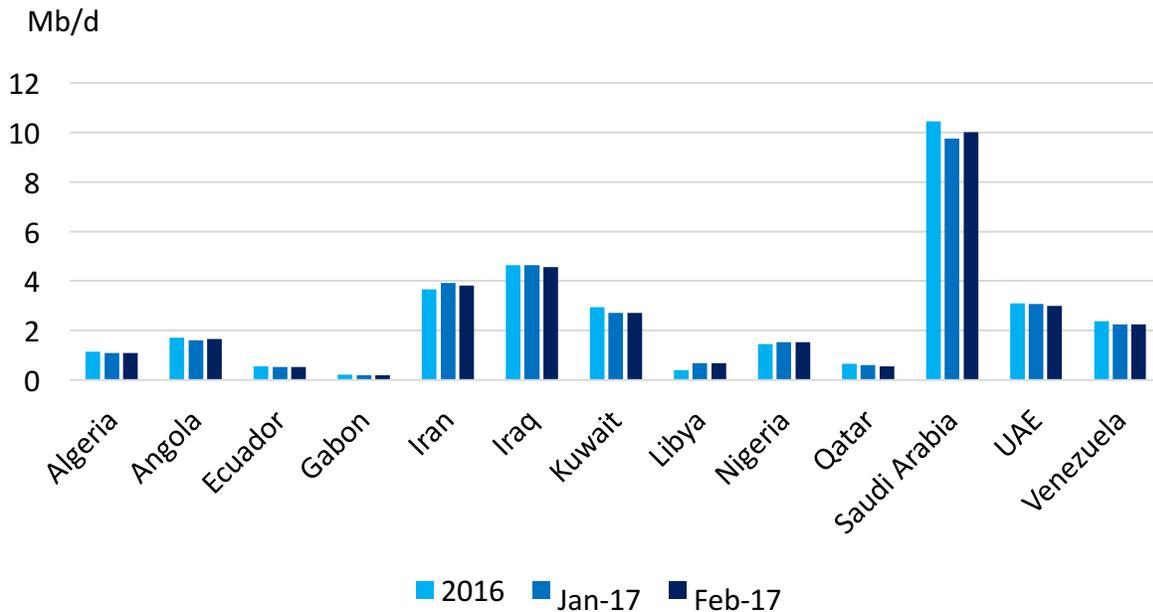
Europe: Europe’s GDP grew by 0.5% in the last three months of 2016. The Eurozone’s growth rate has averaged around 3% since emerging from recession in early 2013. Inflation increased by 1.8% year-on-year, but the increase was mainly due to energy prices, with core inflation remaining at 0.9%. Britain moved closer to exiting the European Union this week after Parliament provided Prime Minister Theresa May the authority to separate from the bloc. Meanwhile, the Scottish First Minister called for a referendum on independence from Great Britain within two years. Also, Dutch voters head to the polls on March 15, which may send a signal about the momentum of populism in Europe.

Turkey: The World Bank earlier this month cuts its 2017 GDP growth forecast for Turkey to 2.7%, while the International Monetary Fund (IMF) is projecting below potential expansion in 2017. IMF expects Turkey’s economy to expand at 2.9% this year and 3.3% in 2018.^{vii}

Asia: Japan’s economy continues to grow while China’s central bank continues to work on containing capital outflows. Stronger exports and an increase in capital spending have driven Japan’s economy for four straight quarters of growth. Japan’s economic recovery is likely to continue, albeit modestly, with support from global economic growth and weakness of the yen. China’s economy grew 6.7% last year, the slowest pace in 26 years. The Chinese government claims that due to a slowing of new credit and government spending, the government has lowered risk of significant economic downturn.

6. Geopolitics & Supply

Figure 11. OPEC Reported Crude Production for 2016, Jan. and Feb. 2017



Iran: The Islamic Republic’s crude production may have reached 3.8 mb/d in February, up 36 kb/d from January, according to OPEC data. According to the OPEC production agreement, Iran’s crude production will not average above 3.8 mb/d for the first six months of 2017. The United States officially put Iran “on notice” on February 1, shortly after Iran confirmed that it tested a ballistic missile. Then in early March, a U.S. Navy ship was forced to change its direction by Revolutionary Guard vessels in the Strait of Hormuz, further demonstrating tensions between the two nations.

Iraq: Oil production was reduced by 120 kb/d in February, or only 58% of its cut target for the first half of 2017. It is unclear which oil fields are participating in the production cut, which is part of the coordinated producers’ agreement. Soon Iraq plans to further reduce production to 210 mb/d. In December, oil production, including the KRG, increased by 30 mb/d to a new all-time high of 4.64 mb/d. Crude exports that month exceeded 4 mb/d for the second straight month after southern oil fields increased output.

Libya: Despite gains earlier this year, oil production and exports remain unstable due to clashes at major oil ports. Oil production was up in early February by 715 kb/d after the El Sharara field came back online in the end of 2016. However, on March 3, the Benghazi Defense

Brigades captured the ports of Es Sider and Ras Lanuf, which appeared to curtail production temporarily. Reports from the National Oil Company suggest that the ports are back open. National output increased steadily since September, when these primary oil terminals were last reopened.

Russia: Oil production averaged 11.11 mb/d in February, representing no further output reduction from January. Relative to October 2016, Russia has reduced output by only 40% of the agreed 300 kb/d cut, according to an analysis of production numbers for each operator in Russia.

Saudi Arabia: While the Kingdom claims to have reduced oil production levels in December, January, and February the OPEC monthly report listed the February production as 263 kb/d higher than January. According to multiple sources, oil production is now around 10 mb/d, down significantly from November’s 10.64 mb/d. It appears that recent curtailments resulted in fewer shipments to Europe, the United States, as well as some customers in Asia.

Venezuela: Venezuela’s oil production has fallen by nearly 300 kb/d since April to around 2.250 mb/d as of January. Falling production has increasingly forced PDVSA to cut sales to refiners in order to send shipments to China and Russia to service loan payments. Venezuela agreed to cut production by an average of 95 mb/d for the first six months of 2017, as part of the producers’ agreement.

7. Renewables

Turkey: Turkey has installed 571 MW of new solar PV capacity in 2016, making it the best year for the country’s solar sector.^{viii} 2017 is expected to be equally good, however there exists some uncertainties regarding future prospects. The so-called “unlicensed” fragment (the projects up to 1 MW) of the market, makes up most of Turkey’s installations. The uncertainties are due to recent changes in the fee that all unlicensed projects pay to the power distribution companies for the transportation of the generated solar power. Overall, Turkey’s total installed capacity has now reached 78.49 GW and the national target for solar PV technology is expected to reach 5 GW by 2023. The increase in the national target from 3 GW to 5 GW has been made in 2014 by the Ministry of Energy and Natural Resources.

Figure 12. Current Situation of Solar Power in Turkey

SITUATION OF SOLAR POWER IN TURKEY				
	END OF 2016 (MW)	NUMBER OF PLANTS	END OF FEBRUARY 2017 (MW)	NUMBER OF PLANTS
SOLAR	12,9	2	12,9	2
SOLAR (UNLICENSED)	819,6	1.043	886	1.120
TOTAL	832,50	1.045	898,90	1.122

Source: TEİAŞ (Turkish Electricity Transmission Company)

Global: Renewable energy technologies are expected to be the largest source of net additions to the power sector over the medium term. According to the IEA, renewable electricity expanded at its fastest ever rate (130 gigawatts) in 2014 and accounted for 45% of net additions to world capacity in the power sector. Significant growth of renewables in India, China, and Latin America are pushing down prices globally for both wind and solar.

United States: During 2016, more than half of new generating capacity in the U.S. power sector came from renewables (both wind and solar), according to the Energy Information Administration (EIA). Of the 2016 renewable additions, nearly 60% were scheduled to come online during the fourth quarter. Renewable capacity additions are often highest in the final months of the year, in part, because of timing qualifications for federal, state, or local tax incentives.



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References

- ⁱ <https://www.dailysabah.com/energy/2017/02/23/turkey-pipelines-carried-500m-barrels-of-crude-oil-in-2016>
- ⁱⁱ http://en.apa.az/azerbaijan_energy_and_industry/oil-export-via-btc-decreased-17.html
- ⁱⁱⁱ https://www.tankterminals.com/news_detail.php?id=4249
- ^{iv} <http://oilprice.com/Latest-Energy-News/World-News/Gazprom-Sales-To-Europe-Turkey-Fall-In-February.html>
- ^v <http://www.techsciresearch.com/news/2329-lng-imports-in-turkey-projected-to-reach-9mmt-by-2025.html>
- ^{vi} <http://www.hurriyetdailynews.com/turkeys-giant-gas-storage-facility-opens-.aspx?pageID=238&nID=109607&NewsCatID=348>
- ^{vii} <http://www.intellinews.com/imf-anticipates-below-potential-2017-growth-for-turkish-economy-115203/>
- ^{viii} <https://www.pv-magazine.com/2017/02/27/turkey-adds-571-mw-of-solar-pv-in-2016/>