

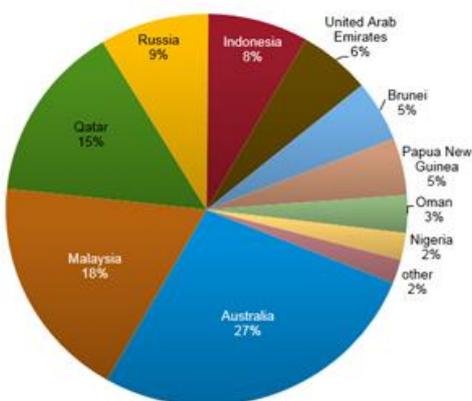
IICEC Energy Market Newsletter

31 July, 2017

Japan Rules Against Destination Clauses in LNG contracts

Japan's Fair Trade Commission ruled recently that destination clauses in LNG import contracts are anti-competitive.ⁱ Standard destination clauses in most long-term LNG contracts restrict where shipments can be unloaded and prevent buyers from selling excess cargoes. Japan would benefit from reselling its excess LNG imports on the spot market. The ruling is in line with the more competitive international gas market pressured by growing world-wide LNG supplies from the United States, Australia, and Africa and the liberal terms of U.S. LNG contracts. Spot LNG prices in northeast Asia are currently around \$6.70 per mBtu, less than a third than a year ago.ⁱⁱ Also, Asian buyers are no longer being overcharged because of their contracts that link LNG prices to oil prices.

Japan LNG imports by source, 2016



Source: EIA

IICEC Director Discusses Energy Security and a Turkish Natural Gas Pricing Hub

IICEC Director Professor Carmine Difiglio explains why Turkey is an ideal location for a regional natural gas pricing hub in a wide-ranging interview in today's *Ekonomist*. He also discusses the relationship between energy security and "energy independence." (Link to the English translation of the interview is as follows: http://iicec.sabanciuniv.edu/sites/iicec.sabanciuniv.edu/files/prof_carmine_difiglio_ekonomist_interview.pdf)



Natural Gas & LNG

(see Technical Appendix for more data)

Spot prices for LNG in Asian markets remain low at \$5.40/mBtu this week, weighed down by oversupply concerns and as the northern hemisphere exits its high demand summer season.

U.S. natural gas spot prices remained stable at \$2.96/mBtu on July 14. U.S. LNG exports remained unchanged.

Dutch and German natural gas spot contracts traded higher last week as estimates for the impact and duration of an unplanned regional outage were raised amid steady demand.ⁱⁱⁱ

The Australian government may intervene in the country's east coast gas market, as LNG suppliers have not supplied enough gas.^{iv}

Qatar, the world's top producer of LNG, is developing floating LNG terminals in South America and Southeast Asia.^v

China's demand for LNG increased more than 30% from 2015 to 2016.^{vi} The government reported that LNG imports increased by nearly 40% during the first half of last year and then fell slowly during the second half.

Oil Market

(see Technical Appendix for more data)

The Brent oil price was \$50.97/b on July 26, up \$4.26/b since July 7. Expectations grew that the long-oversupplied market is moving toward balance as U.S. crude stocks fell sharply and Saudi Arabia announced plans to limit crude exports to 6.6 mb/d in August.

The Brent-WTI spread in July has averaged \$2.38/b, down from May's \$2.80/b and April's \$2.69/b. The spread tightened earlier this month, as U.S. crude storage experienced higher than expected drops, but has recently remained mostly flat.

According to OPEC data, the producer group's output increased by more than 330 kb/d in June to 32.47 mb/d, driven by increased production in Nigeria and Libya.^{vii} In late May 2017, OPEC, Russia, and other partners agreed to extend their cuts through first quarter 2018. Nigeria and Libya are both exempt from the deal, though recent talks in OPEC suggest that this may soon change.

U.S. weekly crude production fell slightly last week, though has remained mostly strong since June. U.S. commercial crude inventories fell by 7.2 mb during the week ending July 21. Crude imports averaged 8.0 mb/d, up by 48 kb/d from the previous week. U.S. crude exports increased by 302 kb/d from the previous week to 1.030 mb/d.

Global product prices fell in line with crude prices during June. In Europe and Asia, crack-spreads increased, while they fell in the United States. Fuel oil prices remained high, supported by tight supplies and strong demand in Asia.

Renewables

China: China is now the world's leading producer of electricity from renewable sources.^{viii} Total generation capacity from renewables now represents 20.5% of the world's total, while the U.S. share is 20%. Chinese companies installed 24 GW of solar capacity in the first half of 2017. The capacity installed in the first half alone equals more than 50 percent of the total solar installed capacity in the U.S. as of the end of 2016. Last year, China doubled its solar power

capacity, adding almost 35 GW to a total 77.42 GW at the end of the year.

Global: According to a recent study, an unprecedented surge of renewable energy projects in the Middle East and North Africa (MENA) region will need more than US\$200 billion worth of investment in the coming years.^{ix} More than 67 GW of clean energy projects are currently in the design phase in the region, which will also necessitate a significant expansion and upgrade of existing power networks to facilitate the extra capacity.

The pipeline of renewable energy projects will increase further in the next five years as governments seek to meet the rapidly growing demand for power through implementing ambitious renewable energy programs.

India: According to a recent report from the Minister of State with Independent Charge for Power, Coal, New and Renewable Energy and Mines Piyush Goyal, India's power grid can manage the integration of 175 GW of new renewable energy by 2022.^x For reference, the U.S. state of New York (which includes New York City) maintains roughly 40 GW of total generation capacity.^{xi} The report – which was developed under the U.S.-India bilateral program “Greening the Grid” – states that power system balancing with 100 GW solar and 60 GW wind is achievable at “15-minute operational timescales with minimal reduction in renewable energy output.”

United States: According to a draft report from the U.S. Department of Energy, the growth of renewable power, including wind and solar, has not harmed the reliability of the U.S. electricity grid.^{xii} Numerous technical studies for most regions of the nation indicate that significantly higher levels of renewable energy can be integrated without any compromise of system reliability, according to the draft. It added that

growth of renewables could require the building of more transmission lines, advanced planning, and more flexibility to balance generation and meet demand.

Economics

Turkey: Government support has helped the economy recover and grow, a year following a failed coup attempt.^{xiii} The stimulus helped GDP recover from 1.8% in 3Q16 to 5% in the first three months of 2017. One part of the package was made up by tax holidays, including the temporary removal of a 6.7% consumption tax, a move that helped many Turkish companies.

Asia: Last week the government left unchanged its overall view of that the economy remains stable, due to a pick-up in consumer spending and exports.^{xiv} The recent economic report stated that the economy is experiencing a moderate recovery. The government and the Bank of Japan have been upgrading their economic assessments recently as private consumption, capital expenditure, a tight labor market, and growing exports point to solid economic growth. In China, the IMF announced last week that the economy is expected to grow by 6.7% in 2017, up from the previous estimate of 6.6%.^{xv} The IMF warned of potential risks from debt piles and other identified factors that some are calling “gray rhinos”, or large and visible problems that are ignored until they move too fast, such as those related to mega bank's balance sheets. China's gross domestic product rose 6.9% in 1Q17, higher than the government's planned target of 6.5%.

Europe: Increased growth in the Eurozone (as well as in Japan and China) is making up for slower than expected growth in the United States, according to a recent IMF report.^{xvi} While the IMF downgraded its forecast for the UK to 1.7% growth this year, the rest of Europe looked

stronger than expected. Thanks to better growth in Germany (1.8%) and France (1.5%) the IMF said it now expected the Eurozone to expand 1.9% in 2017. Other recent estimates are not as positive, as IHS Markit's Euro Zone Flash Composite Purchasing Managers' Index for July, fell to 55.8 from June's 56.3, still comfortably above the 50 level that separates growth from contraction.^{xvii}

United States: A failure by the U.S. Congress to advance tax reform and infrastructure plans led the IMF to downgrade its predictions for U.S. growth to 2.3% in 2017 and 2.5% for 2018.^{xviii} At the end of this week, data for 2Q17 will be released and are expected to show the economy bouncing back from a sub-par 1.4% 1Q17. The GDP growth has not exceeded 3% on an annual basis for a record-breaking 11 years.^{xix}

Geopolitics & Supply

OPEC: Crude output increased by 340 kb/d in June to 32.6 mb/d due to increases from Saudi Arabia, Nigeria and Libya. It is unlikely that Nigeria and Libya, both exempt from output quotas, are forced to comply in the near-term. OPEC compliance slumped to 78%, according to IEA, the lowest rate in 2017.

Non-OPEC: Production outside of OPEC increased by 380 kb/d in June, due to a combination of seasonally higher biofuels production and a recovery in Canada where outages had curbed output since March, according to IEA.

Iran: June output was roughly flat from May, at around 3.79 mb/d, though was up 170 kb/d compared to last year, according to IEA. Crude exports to Europe also remained stable month-to-month at 840 kb/d in June. Shipments to Asia increased slightly from May. Japan's liftings

more than doubled to 130 kb/d and China's purchases rose to 660 kb/d, up 20 kb/d. For now, Iran appears to remain committed to extending the production cuts to March 2018.

Iraq: Crude output, including from the Kurdistan Regional Government (KRG), rose 20 kb/d to 4.5 mb/d in June as exports and domestic refining runs increased. Compliance with the OPEC cut during June slipped to 29%, the lowest since the supply pact took effect in January. Iraq's Oil Minister stated last week that the country's production may reach 5 mb/d by the end of 2017.^{xx}

Libya & Nigeria: A substantial supply recovery in Libya and Nigeria is undermining OPEC's output cut and there is no end in sight.^{xxi} According to IEA, OPEC's actual supply cut for June was just 470 kb/d, as opposed to the expected 920 kb/d.

Despite the lingering threat of oil sector attacks as well as technical constraints, particularly in Libya, both countries have the potential to expand production. According to IEA, if Libya can sustain current rates of 1 mb/d, Nigeria builds slightly on recent gains and the rest of OPEC holds production relatively steady, then July could see OPEC's cutback eroded to below 300 kb/d.

Saudi Arabia: Production increased by 130 kb/d in June to 10.05 mb/d – the highest this year and just below its 10.06 mb/d target, according to IEA. Production during the first five months of 2017 was well below target, which achieved average compliance of 129% before the rate slipped to 102% in June. Exports are expected to fall in the coming months as even more oil is burned in domestic power stations to cover increased seasonal demand.

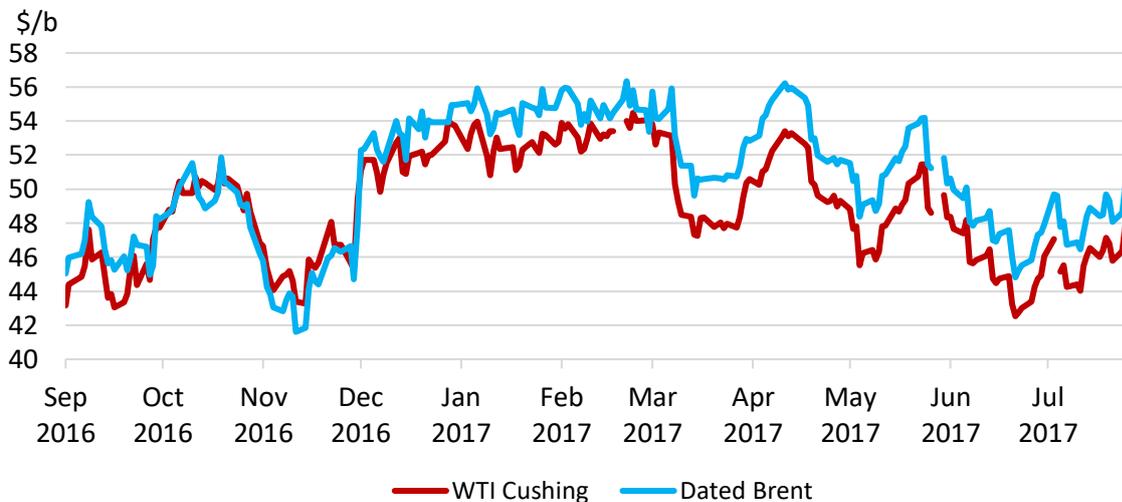
IICEC Energy Market Newsletter Technical Appendix

1. Oil Market

Oil Supply and Prices:

- **The Brent oil price has risen steadily since the first week of July, reaching \$50.97/b on July 26, up \$4.26/b since July 7.** U.S. crude stocks fell sharply last week as refineries increased output and imports declined. The 7.2 m/b decline in inventories was well above market expectations.^{xxii} Expectations that the long-oversupplied market is moving towards balance were also supported by news that Saudi Arabia plans to limit crude exports to 6.6 mb/d in August, about 1 mb/d below the level last year.
- **The Brent-WTI spread in July has averaged \$2.38/b, down from May's \$2.80/b and April's \$2.69/b.** The spread tightened earlier this month, as U.S. crude storage experienced higher than expected drops, but has recently remained mostly flat.

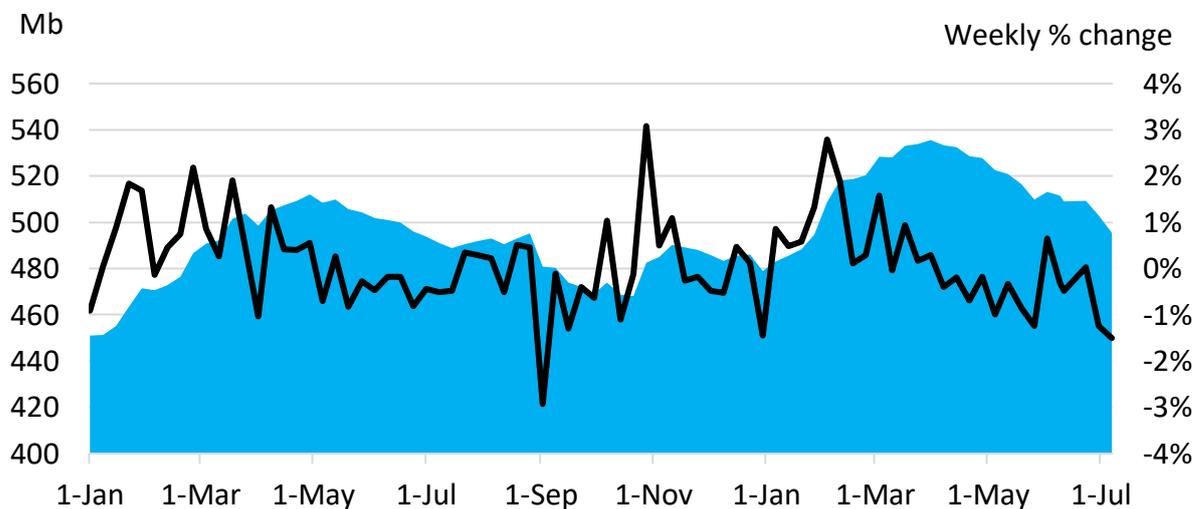
Figure 2. Benchmark Crude Prices



- **U.S. weekly crude production felt slightly last week, though has remained mostly strong since June.** Weekly production reached 9.410 mb/d for the week ending July 21, down slightly from the previous week's 9.429 mb/d, according to EIA. Based on EIA data, weekly crude production grew 22 out of the previous 29 weeks. U.S. oil production began to grow in the 4Q16 after declining over the first three quarters of last year. Average production for 2016 (8.9 mb/d) was below 2015 (9.4 mb/d), though still 1.3 mb/d higher than the average for 2011-2015.

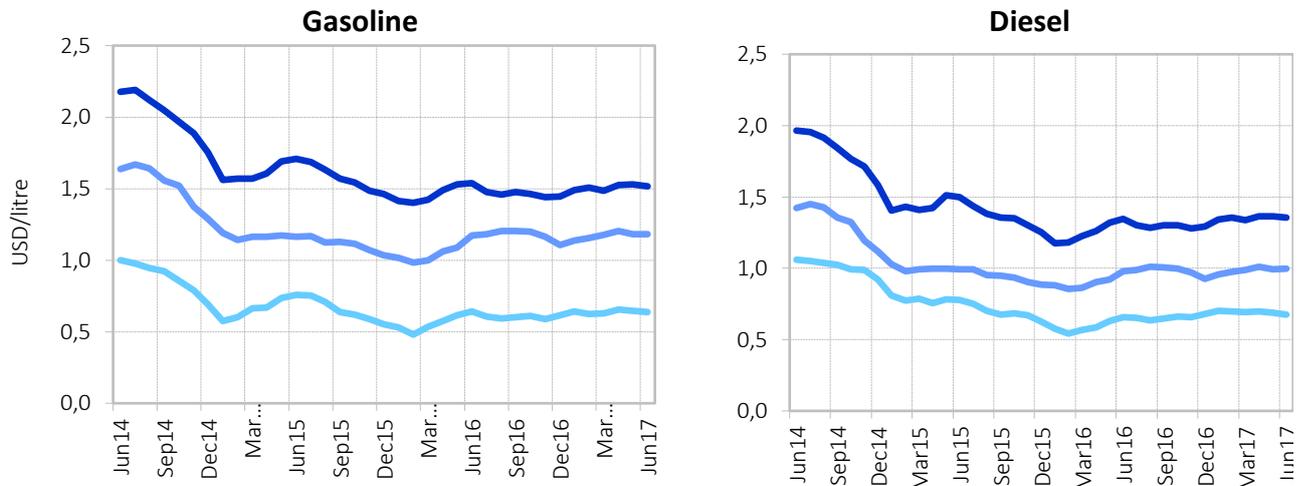
Crude Storage:

- **Preliminary data suggest that OECD commercial stocks fell 6.8 mb in June, according to the IEA.** Seen against the typical stock build for this time of year, the decrease is a strong drop against the five-year average. OECD industry stocks fell 6 mb to 3.047 mb in May, due to lower imports of crude and oil products. Compared to the five-year average, the OECD stock surpluses fell by a steep 33.8 mb.
- **U.S. commercial crude inventories fell by 7.2 mb during the week ending July 21, according to EIA.** At 483.4 mb, U.S. crude oil inventories are in the upper half of the average range for this time of year. Crude imports averaged 8.0 mb/d, up by 48 kb/d from the previous week. U.S. crude exports increased by 302 kb/d from the previous week to 1.030 mb/d. Weekly exports reached an all-time high of 1.30 mb/d in late May.

Figure 3. Weekly U.S. Crude Oil Stocks**Select Product Markets:**

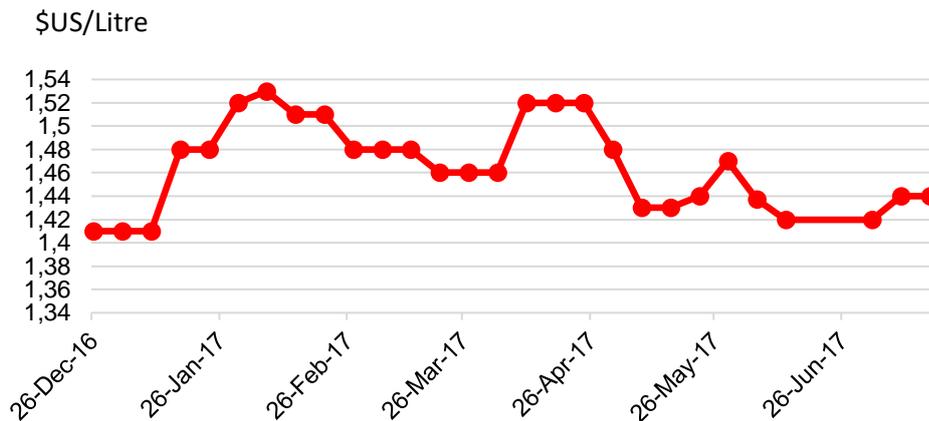
- **Global product prices fell in line with crude prices during June, according to IEA** (Figure 4). In Europe and Asia, crack-spreads (the difference between product and crude prices) increased, while they fell in the United States. Fuel oil prices remained high, supported by tight supplies and strong demand in Asia. Gasoil prices fell broadly in line with crude in June. Naphtha prices fell in June, weighed by ample supplies. US Gulf Coast gasoline pipeline prices fell \$4.29/b to \$61.83/b and the crack to WTI crude was down \$0.93/b month-on-month, according to IEA's monthly report. Demand from Mexico, Venezuela, Nigeria and Indonesia, rather than from the United States and Europe, helped limit the price fall in June.

Figure 4. Select Monthly Product Prices in Europe, Japan, and North America^{xxiii}



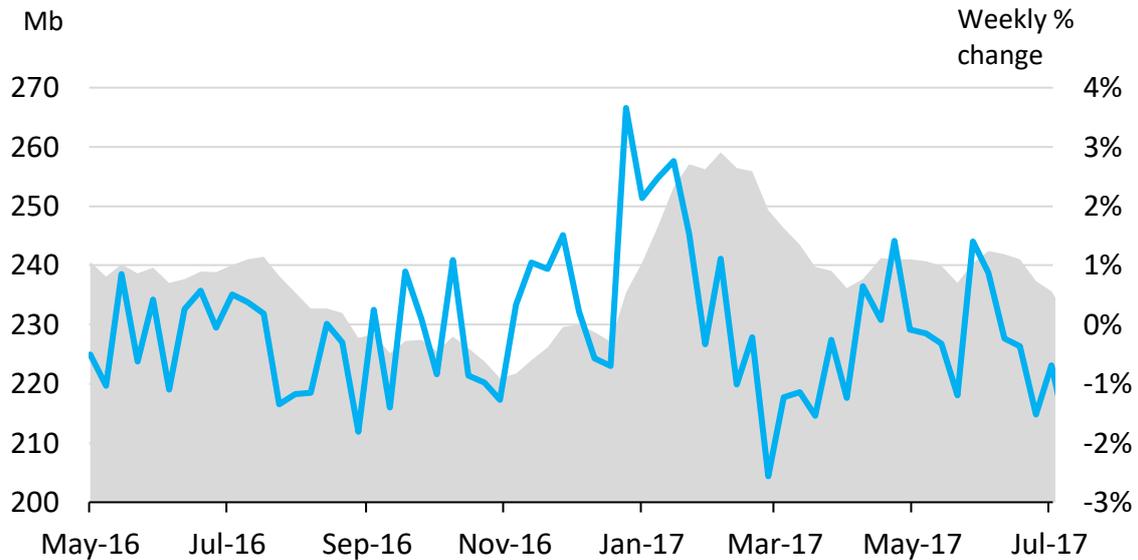
- **Gasoline prices in Turkey** are shown in Figure 6, with prices remaining mostly flat since the beginning of June.

Figure 5. Weekly Average Gasoline Prices in Turkey



- **For the week ending July 21, U.S. crude oil refinery inputs averaged 17.3 mb/d, up 166 kb/d from last week's average.** Gasoline production increased as a result, while refineries operated at 94.3% of their operable capacity. U.S. gasoline stocks decreased by 1.0 mb and they remain in the upper limit of the five-year average for this time of year. The national average retail regular gasoline price increased to \$2.312 per gallon on July 24, \$0.034 higher than last week's price and \$0.130 more than a year ago.

Figure 6. Weekly U.S. Gasoline Stocks and % Change

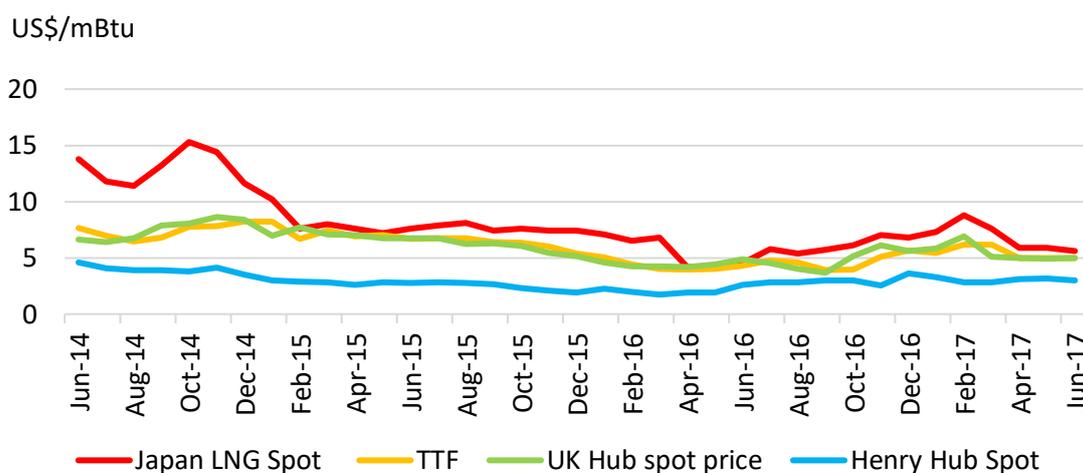


2. Natural Gas & LNG

Prices:

- **Spot prices for LNG in Asian markets remain low at \$5.40/mBtu this week, weighed down by oversupply concerns and as the northern hemisphere exits its high demand summer season.^{xxiv}** That price is down \$0.05 cents from last week and more than 70% below the \$20.50/mBtu peak in February 2014. Prices were up slightly last week due to production outages in Australia, Thailand, and Russia.^{xxv}
- **Weekly U.S. natural gas spot prices fell increased by \$0.01 to \$2.96/mBtu on July 14.** Both supply and demand remained relatively flat—including LNG exports. On a monthly basis, the Henry Hub natural gas spot price averaged \$2.98/mBtu in June, which is \$0.017/mBtu lower than the May average.^{xxvi}
- **Dutch and German natural gas spot contracts traded higher last week as estimates for the impact and duration of an unplanned regional outage were raised amid steady demand.^{xxvii}** The Dutch TTF day-ahead was trading up slightly during the week.

Figure 7. Select Natural Gas Prices



Supply:

- The Australian government may enhance its intervention in the country's east coast gas market, as commitments have not gone far enough from LNG suppliers to ensure the local market there is well supplied with gas.**^{xxviii} Last week, the Federal Resources minister found the situation "unsustainable" as Australia may soon become the world's largest LNG exporter while domestic gas prices are some of the highest in the world. The legislature is set to receive advice from the country's regulator by November on whether or not to restrict LNG exports starting in 2018.
- Qatar, the world's top producer of LNG, is embarking on a project to develop floating LNG terminals in new markets, namely South America and Southeast Asia.**^{xxix} With a few long-term contracts expiring in the near-term, Qatar is establishing a new supply strategy for new markets. Floating terminals are useful for developing countries that need quick access to cheap gas. A total of 40 floating import terminal projects exist in varying stages of development across the globe. Despite the fact that the diplomatic crisis with its neighbors continues, Qatar is ramping up investment in new LNG projects. In April, Qatar lifted a moratorium on new projection and announced plans to boost LNG projection by 30%.
- U.S. LNG exports remain the unchanged week over week.**^{xxx} One of the U.S. LNG export projects, Freeport LNG, filed an application with the Federal Energy Regulatory Commission for authorization to construct the fourth train at the facility, which has a nameplate capacity of 0.67 Bcf/d and a target online date in 2022. Three other trains are currently under construction and are scheduled to come online "sequentially between Q4 2018 and Q3 2019," according to a Freeport LNG announcement.

Demand:

- **China's demand for LNG increased more than 30% from 2015 to 2016.^{xxxi} The government reported that LNG imports increased by nearly 40% during the first half of last year and then fell slowly during the second half. The dramatic increase is due to China's desire to rely less on coal, and due to the lowering of policy barriers for international gas to enter the Chinese market.**



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