# IEEJ e-NEWSLETTER

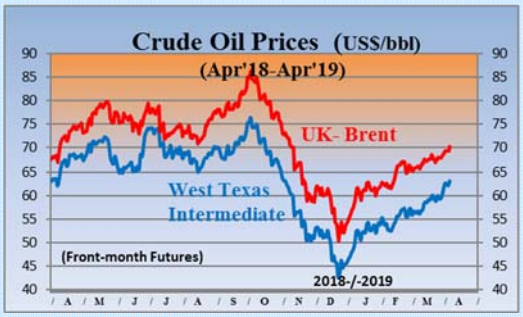
## No. 158

(Based on Japanese No. 187)

**Published: April 8, 2019**

**The Institute of Energy Economics, Japan**

**(As of April 5, 2019)**




Source:
(1) DOE-EIA
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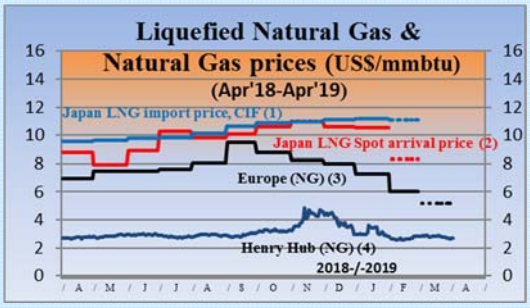


Sources:
(1) Ministry of Finance "Japan Trade Statistics"
(2) Ministry of Economy, Trade and Industry (arrival month basis)
(3) Estimated by World Bank (Netherland Title Transfer Facility)
(4) DOE-EIA, NYMEX (Front-month Futures)
(5) Investing.com and Finance.Yahoo.com


Source: x-rates.com


Source: Investing.com and Finance.Yahoo.com

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## Summary


### 1. Developments in Nuclear Power

**The Japan Atomic Energy Relations Organization released the results of a nuclear power survey conducted in October 2018. Among the interesting results were that more people than last year answered that nuclear power needs to be restarted to ensure a stable supply of electricity.**

### 2. Recent Developments in the Oil Market

**Oil prices remain steady as the market focuses on tightening of supply and demand, such as the expected production decline in Iran and Venezuela and the production cut by OPEC Plus, rather than macroeconomic risks.**

### 3. Recent Developments in the LNG Market

**Japanese LNG import prices finally began to decline with effects from crude oil prices with time lags and from weaker spot LNG prices. Increasing supply from the United States is also expected to bring changes to Japan's LNG import prices.**

### 4. Update on Policies Related to Climate Change

**The Joint Meeting of the Central Environment Council's Global Environment Committee and the Industrial Structure Council's Global Environment Subcommittee was held to deliberate the progress of the Global Warming Countermeasures Plan by FY2017.**

### 5. Update on Renewable Energies

**The sixth meeting of the German-Japanese Energy Transition Council was held in Berlin on March 6 and 7 to discuss two new themes: digitalization and hydrogen.**

# 1. Developments in Nuclear Power

**Tomoko Murakami**, Senior Economist, Manager
Nuclear Energy Group
Strategy Research Unit

On March 7, Finland's Ministry of Economic Affairs and Employment announced that it will issue a license to operate Olkiluoto 3 (European Pressure Reactor (EPR), 1,720 MW), Finland's fifth nuclear power plant, to its owner Teollisuuden Voima (TVO) based on the Finnish Nuclear Energy Act. The plant is currently in the final stage of construction, with Finnish nuclear regulator STUK supervising TVO's preparations for loading fuel and starting operation. TVO plans to start commercial operation of the plant in early 2020, and if things go well, Olkiluoto 3 will be the third EPR in commercial operation following China's Taishan 1, which began commercial operation in December 2018, and Taishan 2, which is due to follow sometime in 2019. The operational experience of EPRs will provide valuable information for EDF which is developing EPR2, the next-generation light water reactor, by improving the design of the EPR.

Russia and China continue to push nuclear development in their countries while enhancing their presence in the international nuclear market. Recently, they took steps toward deeper long-term cooperation in nuclear power. On March 7, during a visit by Russian President Vladimir Putin to China, Rosatom's subsidiary Atomstroyexport (ASE) and China National Nuclear Corporation (CNNC) signed an agreement on the construction of two units at Tianwan (units 7 and 8) and two at Xudabao (units 3 and 4). The Tianwan site currently has units 1-4 (Russian VVER) in operation and units 5 and 6 (Chinese ACP1000) under construction while at the Xudabao site, plans are being drawn up for units 1 and 2 (Chinese CAP1000). China, which already actively exports its domestic reactors to other countries, has not clearly stated why it selected a Russian reactor type for its next domestic construction projects. The progress and background of these projects need to be closely monitored and analyzed.

On March 12, the Japan Atomic Energy Relations Organization (JAERO) released the results of a public survey on nuclear power conducted in October 2018. In this survey, which has been conducted since FY2006, 1,200 respondents of both sexes aged 15-79 are briefed on the purpose of the survey by JAERO staff and are each given a questionnaire to fill out for later collection. The questions are mostly the same every year in order to monitor the trend in answers over time. As with previous years, negative answers far exceeded positive ones on the regular question about the image of the term "nuclear power," with answers such as "dangerous (69.0%)" and "disturbing (56.0%)" receiving high scores. However, there were also some changes from before, with "necessary" increasing from 17.9% to 24.3% and "unreliable" decreasing from 30.2% to 21.8% compared to 2017.

More respondents answered that "it is necessary to restart nuclear power for a stable supply of electricity (18.6% → 26.7%)" while fewer people thought that "it is not necessary to restart nuclear power as there is enough electricity (24.7% → 18.7%)." JAERO thinks this may be a temporary phenomenon stemming from a spike in people's attention on a stable supply of electricity after an extensive blackout in Hokkaido a month before the survey, and careful monitoring is therefore required. These survey results provide an interesting glimpse of people's risk awareness.

## 2. Recent Developments in the Oil Market

**Tetsuo Morikawa**, Senior Economist, Manager
Oil Group and Gas Group
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Oil prices remain steady. Brent is in the higher $60 range as of late March as the market focuses on tightening of supply and demand than on macroeconomic risks.

Major causes of tighter supply and demand include the expected production decline in Iran and Venezuela, and the production cut by OPEC Plus. According to the International Energy Agency, Iran's production remained unchanged month-on-month in February at 2.74 mb/d while that of Venezuela declined by 0.1 mb/d month-on-month, or 8%, to 1.14 mb/d. With the sanctions waiver on Iran's petroleum exports set to expire on May 4, Iran's output is not likely to increase significantly. The situation in Venezuela has worsened after the United States imposed tougher sanctions, with the blackout in mid-March affecting oil production as well. The combined output of these countries may drop from around 3.9 mb/d in February to 3.3 mb/d by the end of 2019, depending on whether the expiry of the sanctions waiver in early May is postponed. OPEC Plus' compliance rate with the joint production cut remains high at around 90% as of February, with Saudi Arabia and the UAE cutting production by more than they had pledged to. A comment by Energy, Industry and Mineral Resources Minister Khalid Al-Falih of Saudi Arabia that OPEC Plus' production cut will likely be extended beyond June is also propping up prices.

Meanwhile, macroeconomic risks include the US-China trade war, the slowdown in Europe's economy, and Brexit in the short term. Regarding the trade war, SINOPEC's purchase of US crude in mid-March suggests that a deal will be struck between the countries and tariffs will be lowered by the end of May when the cargoes arrive in China. If this indeed happens, macroeconomic risks would be lowered causing oil prices to look up. Although the European Central Bank ended its asset purchase program at the end of last year, the European economy is slowing, as shown by the start of recession in Italy. A no-deal Brexit at the end of March seems less likely as the UK parliament has voted to ask for an extension of Brexit, but there is no sign of agreement on the biggest sticking point: what to do about the border between Northern Ireland and the Republic of Ireland. However, the market seems to consider that these risks for Europe will have only a limited impact on the macroeconomy.

On March 7, the 26th meeting of the Natural Resources and Fuel Committee of the Advisory Committee for Natural Resources and Energy was held to discuss the key focuses of the future policies, and the measures for ensuring a more resilient fuel supply in case of disaster and their progress. While the need for Japanese oil companies to expand overseas activities has been emphasized by the study group for the petroleum industry toward enhanced competitiveness and other government bodies, it is Middle Eastern state oil companies that are stepping up refinery construction projects in China, India, and Southeast Asia. Middle Eastern countries are also committed to EOR, production of chemicals and other carbon recycling technologies to prevent the stranding of their oil and gas assets. Carbon recycling and the development of zero carbon hydrogen using fossil fuels may become important as a new direction for the oil industry when considering the resource diplomacy of Japan and the overseas expansion of Japanese oil companies.

## 3. Recent Developments in the LNG Market

**Hiroshi Hashimoto**, Senior Analyst
Gas Group
Fossil Energies & International Cooperation Unit

In late February 2019, Japan's ten biggest electric power and four biggest city-gas companies announced adjustments of retail prices for April reflecting changes in resource and fuel costs under the price adjustment system. The fourteen companies reduced their respective prices based on lower import prices in January 2019. This is the first downward adjustment for the ten electric power companies in 16 months and for the four city-gas companies in 15 months. However, although the average import price of LNG in January declined in Japanese yen for the first time since October 2017 partly due to the stronger Japanese currency, the price, in fact, inched up to USD 11.21 per million Btu, 15 straight-month increases in USD. (The average import price of LNG in February went down month-on-month in both yen and dollars, according to the Japanese customs statistics released in late March.)

On the other hand, spot LNG prices in Asia, which have been declining since the beginning of 2019, were in the USD 6s in February for deliveries in March and April and were below USD 6 in March for deliveries in April and May. Although China's demand for LNG has been still steadily growing so far in 2019, incremental LNG supply capacity, mainly from Australia, the United States, and Russia, has been growing even faster, enforcing downward pressure on spot LNG prices.

LNG contract prices under traditional long-term LNG sales agreements lag trends in the international crude oil market by more than three months, due to time lags between international crude oil prices and Japanese crude oil import prices, as well as Japanese crude oil and contracted LNG import prices. Thus, blessings of declining international crude oil prices in the last quarter of 2018 did not appear in LNG prices in Japan until February 2019.

One of the motives to introduce LNG from the United States is to overcome the deficiency in the traditional LNG pricing. In the 2018 calendar year, while Japan's LNG import declined slightly in the total volume, its import of LNG from the United States increased significantly to 2.5 million tonnes in the year from 0.95 million tonnes in 2017 thanks to newly commenced deliveries under long-term contracts. Notably in the fourth quarter 2018 when crude-oil linked LNG contract prices were rising, prices of LNG from the United States with no linkage to crude oil prices were below the overall average and mitigating the overall upward trend. Three LNG export project are expected to be online in the United States in 2019, including two with Japanese involvement in development and offtake commitments. By blending supply from the United States with Japanese other LNG sources, LNG import prices are expected to be stabilized further.

Many of the investment decisions in LNG projects in and after 2019 are expected to be made in the United States. One was already made in early February at the Golden Pass Project in Texas. The Venture Global Calcasieu project, also on the Gulf Coast, with annual capacity of 10 million tonnes, has secured federal approvals of construction and exports. The latter project has secured long-term sales contracts mostly with European companies, in contrast with the former without long-term sales into specific consuming markets.

## 4. Update on Policies Related to Climate Change

**Takahiko Tagami**, Senior Coordinator, Manager
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On March 1, the Joint Meeting of the Central Environment Council's Global Environment Committee and the Industrial Structure Council's Global Environment Subcommittee was held to deliberate the progress of the Global Warming Countermeasures Plan by FY2017. Regarding the progress of policies and measures, progress in policy evaluation indicators and emission reductions as well as their evaluations were presented. The evaluation of progress was explained to have reflected the results for FY2017 as well as the forecast from FY2017 to FY2030, the detailed method, however, has not been disclosed.

The Environment Ministry has evaluated, on the policies and measures related to the Ministry, 45% of those for the industrial sector as "D: behind the FY2030 target" and 46% of those for the household sector as "B: ahead of the FY2030 target," where the percentages are calculated based on the share of estimated emissions reduction in FY2030 by the respective policies and measures in each sector. Meanwhile, METI reported, based on the preliminary figures for GHG emissions for FY2017, the progress by FY2017 compared to the FY2030 target, as 81.5% for the industrial sector and 23.3% for the residential sector. The reports highlighted the large difference between the ministries in their evaluations of the efforts.

In this joint meeting, IEEJ Chairman & CEO Masakazu Toyoda commented as follows: (1) There are significant discrepancies between the ministries in their evaluations of the policies a and measures in the Global Warming Countermeasures Plan. The common criteria for evaluation need to be adopted across the ministries. (2) It seems odd that there is no reference to a nuclear power, which is a zero emission power source, in the documents of either ministry. An accumulated experience in safety measures will accelerate the restart of nuclear power plants, which would contribute to low emissions. (3) Innovation is essential for an emissions reduction in the medium to long term, and we should discuss extending border-divided nationally determined contributions set under the Paris Agreement into contributions to a global emissions reduction through innovation.

To evaluate the progress of policies and measures under two ministries, the author calculated the progress rate using the document, "Progress of Global Warming Countermeasures Plan in FY2017 (policies and measures under the Ministry of Economy, Trade, and Industry and the Ministry of the Environment) (a detailed version)" distributed at the joint meeting. Based on the emission reductions by respective policies and measures in this document, the progress rate was obtained by calculating the difference of emission reduction between FY2013 and FY2017 divided by the difference of those between FY2013 and FY2030. As a result, the progress rate was 25.3% for the manufacturing sector, 22.1% for the commercial sector, 23.6% for the residential sector, 12.7% for the transportation sector, 41.9% for the expansion of renewable electricity, 27.2% for the reduction of energy-related $CO_2$ emission from electricity generation, and 0.9% for fluorinated gases. Both the manufacturing and residential sectors were slightly above the 23.5% line expected at the end of the fourth year in the 17 years from FY2013 to 2030.

Regarding the contribution of nuclear power to the reduction of energy-related $CO_2$ emission from electricity generation, the contribution of zero emission power sources as a whole was 19.3% in FY2017 (the rest was from an improved energy efficiency and a fuel switch), of which 3.1% points came from nuclear power. According to the latest electricity statistics published in March 2019, nuclear power generated 67.8 TWh of electricity in December 2018, 2.5 times the monthly average of the previous fiscal year.

## 5. Update on Renewable Energies

**Yoshiaki Shibata**, Senior Economist, Manager
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Electric Power Industry & New and Renewable Energy Unit

The IEEJ, Germany's Wuppertal Institute for Climate, Environment and Energy and others have been organizing the German-Japanese Energy Transition Council (GJETC) consisting of nine experts from Japan and Germany since May 2016 with the help of respective governments. The Council selects subjects from the long-term energy strategies of both countries, commissions external parties to study each theme, and reports and discusses the achievements of the studies to help draft policy proposals. The sixth meeting of GJETC was held in Berlin on March 6 and 7 to newly discuss digitalization and hydrogen, the themes selected for this fiscal year.

The discussion on digitalization focused on virtual power plants (VPP). While not yet commercialized in Japan, there are cases in Germany where VPP technology, which aggregates a large number of variable renewable power sources (controls and manages them together to operate as if a single plant), has been commercialized. One reason behind this difference between the countries is the difference in the renewable energy policies and power market structures of the countries. An increase in the installed capacity of variable renewable energy sources usually demands more flexible operation of the power system, raising expectations for the use of VPP; however, the progress of its commercialization will depend on the renewable energy policy and the situation of the electricity market.

In other words, there will be no need or incentive for aggregation so long as renewable power can thrive on its own under the government's renewable policy with generous subsidies as with the FIT system. However, business opportunities for VPP have grown in Germany due to the policy requiring direct sales of renewable electricity in the wholesale market. Further, regarding the electricity market, the creation of a supply-demand adjustment market in Germany is encouraging VPP and other new players to enter the market. These experiences of Germany may provide lessons on how to commercialize VPP in Japan, which is winding down its FIT system and reforming its electricity market.

Regarding hydrogen, the two countries confirmed their common understanding on the importance of hydrogen for decarbonizing the energy system and improving energy security, although their approaches are very different. There are two main differences. First, while Japan is looking into both blue hydrogen (fossil fuel＋CCS) and green hydrogen (produced from renewables), Germany is considering green hydrogen only. This stems from the different stances of the countries toward expanding renewable capacities in their countries and toward CCS. Germany has a greater renewable capacity than Japan and tends to be skeptical of CCS in terms of social acceptance and sustainability. Second, while Japan considers imported hydrogen as an important option, Germany sees domestic hydrogen production as essential.

Meanwhile, the two countries shared a common vision for the introduction of hydrogen, forecasting it will start from around 2030 and expand toward 2050, and the same view on the importance of building international ties to expand the use of hydrogen. Further, there was a comment that Germany needs to take note of the hydrogen-related road map and strategies of Japan and to formulate and establish its own in Germany.

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