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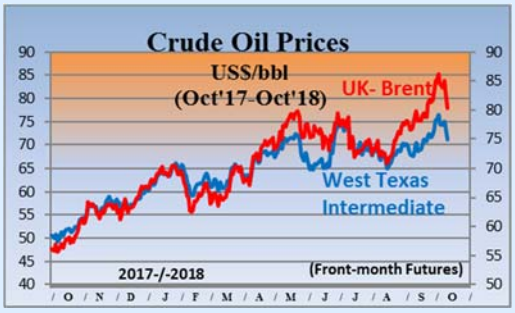
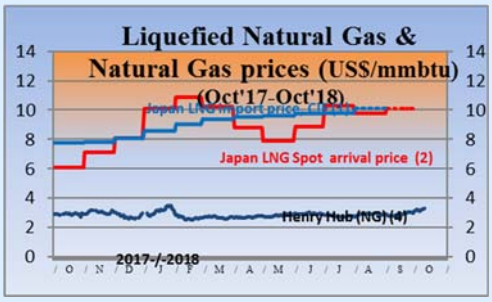


Source: DOE-EIA, Financial Times, NASDAQ



Sources:
(1) Ministry of Finance "Japan Trade Statistics"
(2) Ministry of Economy, Trade and Industry
(contract month basis)
(3) Estimated by World Bank and World Gas Intelligence
(4) DOE-EIA, NYMEX (Front-month Futures)
(5) Investing.com

Source: x-rates.com

Source: Financial Times

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The Hokkaido Eastern Iburi Earthquake had limited impact on the local oil and gas markets. In the international oil market, political factors such as economic sanctions on Iran and the trade war are starting to distort the market.

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There are demands to shift to distributed power supplies after a complete power cut, but this would require ensuring self-operating power sources including batteries. Reducing their costs is a higher priority.

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Efforts are being stepped up to reduce renewable energy costs, including test auctions of commercial solar PV and consideration of a major reduction of the renewable energy purchase price at a government council.

1. Developments in Nuclear Power

Tomoko Murakami, Manager
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The 62nd General Conference of the International Atomic Energy Agency (IAEA) met at the Vienna International Centre from September 17 to 21. With more than 2,500 participants from 153 IAEA member countries, the Conference featured reports and discussions on various activities of the IAEA in 2017 for improving the nuclear safety of and formulating safety standards for its member states. In addition to the traditional activity of drawing up safety standards, this year's Conference covered emerging issues in many countries including the benefit of nuclear power as a climate action and extending the lifetime of nuclear power plants and dealing with their aging, as well as the denuclearization of North Korea and the Iran nuclear deal.

On August 29, the US Nuclear Regulatory Commission (NRC) accepted an application for the second lifetime extension of Exelon's Peach Bottom Units 2 and 3. Extension of operational period is a common concern for developed countries. The IAEA General Conference is also an opportunity for Japan to actively share its regulatory standards and inspection system with other countries and should continue to be used effectively as a forum for disseminating information and exchanging opinions.

Roughly two weeks before the IAEA General Conference, the annual symposium of the World Nuclear Association (WNA) was held in London from September 5 to 7. Nuclear operators and suppliers from various countries shared their prospects on the international nuclear power market and their business strategies, and panels discussed topics including how to ensure the success of nuclear new builds. Originally led by Western countries, this year's event saw three speakers from Russian companies and three from Chinese ones, in addition to Western operators. On the other hand, there was just one speaker from Japan and none from South Korea. This clearly illustrates the current situation in which Russia, China, and emerging countries cooperating with them are the only countries where nuclear new build projects are going smoothly.

On September 4, Japan's Nuclear Regulation Authority (NRA) discussed Chugoku Electric's Shimane Unit 3 for the first time in a review meeting. Despite Chugoku Electric's plan to apply the result of the ongoing review for Shimane Unit 2 for "ground and tsunami" to Unit 3, the NRA judged the lack of evidence for earthquakes and tsunami on the application documents for Unit 3 as a flaw and decided to hold off the next meeting until Chugoku Electric submits a corrected application. However, the documents presented by Chugoku Electric to the review meeting had the same content that the company had explained to the Nuclear Regulatory Agency at the first hearing on August 27. The Agency had not pointed out any issues to the company back then and simply instructed them to "continue to prepare review documents." The appropriateness of the instructions from the NRA and its Agency is open to doubt.

On September 25, the Hiroshima High Court decided to lift its earlier preliminary injunction last December barring Ikata Unit 3 from restarting. Shikoku Electric plans to prepare to restart the plant unless another preliminary injunction is made. Developments in this ongoing lawsuit will continue to be monitored.

2. Recent Developments in the LNG and Oil Markets

Yoshikazu Kobayashi, Senior Economist, Manager
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The Hokkaido Eastern Iburi Earthquake that struck before dawn on September 6 damaged the facilities of Idemitsu Kosan's Tomakomai oil refinery (refining capacity of 160 kb/d), stopping the only oil refinery in Hokkaido prefecture. However, the supply of petroleum products in Hokkaido has returned to order following the release of local stocks and receipt of supplies from Honshu island, although initially some residents rushed to gas stations due to fears of shortages.

The supply of city gas in the prefecture has not been affected. The Ishikariwan Shinko gas-fired power station of Hokkaido Gas, which was not scheduled to start operation until October, began to transmit power on September 8 to alleviate power shortages in the prefecture.

In the international oil market, more turbulence is expected toward the end of the year. First, exports of Iranian crude are steadily decreasing due to US sanctions. The exports, which exceeded 2.5 mb/d in April, declined to 1.6 mb/d as of August and may drop further to 0.7-0.8 mb/d in November when the sanctions take effect. The drop in supply can be managed by Saudi Arabia and other OPEC countries increasing output, but the situation remains unpredictable due to the uncertainty of production in Libya and Venezuela. Transactions are already increasing in the US crude futures market which is expecting oil prices to rise toward the end of the year, with the transaction volume of $80/bbl call options (purchase rights) soaring.

The impact of the US-China trade war should also not be underestimated. As the trade war threatens to adversely affect the economy of the two countries and the world, its impact is appearing in the product price gap and trade flows. Chinese companies are buying less US crude after China added crude oil to the list of goods for possible retaliatory tariffs even though the tariffs are yet to be imposed. Meanwhile, orders for African and Middle Eastern low-sulfur oil are increasing as substitutes for US crude. This is widening the price gap between Brent, which is susceptible to the international supply-demand balance of low-sulfur oil, and the US crude index WTI to nearly $8/bbl as the trade war causes distortion in the crude oil market. The impact of the 10% additional tariff imposed on LNG from September 24 on prices will be limited as the volume of US exports to China is not so large. However, there is concern that the tariffs may render future exports to China unpredictable and thus affect investment in US new build projects.

In June 2017 Japan's Fair Trade Commission announced a report on LNG trade and stated that work on abolishing the destination clause is well under way with new contracts but not with existing ones. In June this year, the European competition authorities launched an investigation into the existence of destination clauses in existing LNG contracts between European firms and Qatar. While the status of the investigation is unknown, it could help abolish destination clauses for existing contracts in Asia depending on the outcome. Developments must be closely monitored.

3. The Hokkaido Eastern Iburi Earthquake and the Electricity Market

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The Hokkaido Eastern Iburi Earthquake that struck on September 6 caused a complete blackout in Hokkaido Prefecture due to damage to the three units of the Tomato Atsuma Power Station (1,650 MW in total). Even after the power cut was almost fully resolved on September 8, it remained extremely difficult to keep the supply-demand balance as supply did not recover fully, and the reserve rate fell below 3% on September 14 and 15 despite calls to save electricity. Calls for electricity saving were eased after the failed Tomato Atsuma Unit 1 (350 MW) returned to operation on the 19th and Unit 4 (700 MW) on the 25th. The recovery of Unit 2 (600 MW) is keenly awaited ahead of the winter peak season.

The blackout triggered by the shutdown of large power plants led to calls to shift to a business framework centered on distributed power supplies and claims about delays in introducing dispersed supplies. Hokkaido is more careful in expanding renewable electricity as its power grid is small and it has only a DC line connecting it with Honshu island. It is, however, steadily expanding renewable capacity while examining from various perspectives whether it has enough capacity for adjustment to deal with fluctuations in renewable power output.

Hokkaido relies heavily on the HVDC Hokkaido-Honshu line (maximum 600 MW) and the Kyogoku Pumped-storage Hydroelectric Power Plant (variable speed, maximum 400 MW) for spinning reserve for immediate response when power plant accidents occur. The recent complete blackout was caused by a loss of power sources exceeding the spinning reserve capacity. Among renewables, solar PV and wind power output may be more likely to fluctuate suddenly. Simply introducing distributed power sources does not solve the problem, as it is necessary to prepare for thermal power plant accidents and wind and solar power fluctuations occurring simultaneously.

Based on these circumstances, Hokkaido is requesting that a battery cell be installed for every new 20 kW or larger wind power plant introduced since April 2016 to keep short- and long-term absorbed fluctuations within certain levels. Options such as installing batteries on the power grid itself and using the HVDC Hokkaido-Honshu line are also being considered to reduce the total cost of installing batteries and the cost burden for each site where a battery is installed and operated. Hokkaido is fully using all available technologies while introducing wind and solar power, which deserves recognition.

In recovering from the recent blackout, hydropower stations, which can meet load-dispatch instructions and can operate by themselves, restarted first, and then thermal power stations used the electricity from those hydro plants to restart. It must be noted that if wind and solar power in the power grid increases, there will be many more issues to consider when recovering from a complete blackout, including what to use as a self-operating power source to initiate the recovery from a power cut and how wind and solar power should be reconnected to the grid.

4. Update on Policies Related to Climate Change

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From September 4 to 9, the Ad Hoc Working Group on the Paris Agreement (APA) and Subsidiary Bodies were convened in Bangkok, Thailand to consider the rulebook for the Paris Agreement. Differentiation and finance continued to hamper the progress of deliberations.

Developing countries are aiming to set differentiated obligations and standards between developed and developing countries. Regarding finance, the United States has proposed, with the support of Japan and Australia, to remove rules on how countries account for climate finance contributions so that developed countries could count commercial loans as their financial obligation. Furthermore, developed countries are refusing to discuss how developed countries inform of their future funding plans. With the United States withholding payment of its $2 billion commitment, the Green Climate Fund (GCF) board meeting in July descended into chaos over the replenishment of fund and deferred the approval of mitigation and adaptation projects. This fueled distrust in developing countries and is casting a dark shadow over the negotiations. The document compiling the outcomes of the negotiations up to this session totals 305 pages. The APA Co-chairs and the Chairs of the Subsidiary Bodies will prepare textual proposals by mid-October 2018 that would be helpful for advancing Parties' deliberations to facilitate successful completion of the rulebook for the Paris Agreement at COP24.

In June, Miguel Arias Cañete, EU Commissioner for Climate Action & Energy, said that the EU would begin the process to raise the EU's 2030 GHG target to reduce emissions from 40% to 45% compared to 1990 levels. On August 26, German Chancellor Angela Merkel said that she is "not so happy at the moment about these new proposals because many member states already aren't fulfilling today what they promised. I think we must first keep to the targets we set. I don't think that permanently setting new targets makes sense." Meanwhile, on September 12, President Jean-Claude Juncker of the European Commission supported Commissioner Cañete's proposal in his State of the Union address at the European Parliament. However, he did not mention any specific numbers or the prospects for the EU's long-term strategy for 2050. Whereas emissions in the EU are decreasing by an annual average of 0.6% for 1990-2008 and 1.8% for 2010-2016, the decrease in Germany is slowing from an annual average of 1.4% for 1990-2008 to 0.6% for 2010-2016. To meet the 2030 target (down 40% from 1990 levels for both entities), the EU needs to shed 1.7% per year whereas Germany needs to cut 3.4%, giving the country little chance of meeting its target.

China achieved its 2020 goal of reducing CO_2 emission intensity per GDP by 45% from 2005 level three years ahead of schedule. BP statistics show that CO_2 emission in China remained stable for three years since 2013 before rising 1.3% year-on-year in 2017, and this trend is projected to continue. Backed by the trend of emission and the China's potential in reducing emission around 2030, the paper published by the National Center for Climate Change Strategy and International Cooperation (NCSC) on June 3 recommended the government to evaluate and demonstrate options for updating its 2030 emission target including raising the emission intensity target and expanding it to include non-CO_2 GHGs.

In Japan, the second meeting on the Long-Term Strategy under the Paris Agreement as Growth Strategy was convened on September 4 for a hearing with external experts on innovation.

5. Update on Renewable Energies

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On September 4, the result of the second auction for large scale solar PV (2 MW or more) was announced. Nine bids worth 197 MW ranging from ¥16.47/kWh to ¥20.99/kWh were placed for the auctioned 250 MW slot. There was no successful bidder as all bids were higher than the undisclosed upper price limit of ¥15.5/kWh. It was decided not to disclose the upper limit after the first auction in autumn 2017 in which several bids were placed at the upper limit of ¥21/kWh which had been disclosed in advance. Non-disclosure this time was intended to promote competition.

The guideline on setting the upper price limit released in advance by the Procurement Price Calculation Committee as a reference for operators states that a lead time of solar PV to start operation is around three years and forecasts that the cost of power generation may fall below ¥15/kWh by around 2020. Considering that the solar PV auctioned now will go into operation around 2020, in retrospect an upper limit of ¥15.5/kWh could have been guessed. Meanwhile, many operators presumably used ¥18/kWh, the purchase price of commercial PV for this fiscal year, as a guide, as five of the nine bids were between ¥17 to ¥18/kWh.

Even though four bids from this auction were below the minimum bidding price of ¥17.2/kWh for the first auction, the second auction is not considered a success as the capacity offered for auction was not reached, like the first time. Renewable operators appeared to be adopting a wait-and-see attitude for this auction and to be preparing strategies for the third auction by checking the upper limit released along with the auction result. FY2017 and FY2018 are considered as a test auction period, and the Procurement Price Calculation Committee is due to examine and revise the bidding system after the results of the third auction scheduled for December come out.

Under such circumstances, the target price level for renewable energies was discussed at the Subcommittee on Mass Introduction of Renewable Energies and Next-Generation Energy Networks held on September 12. A consensus was formed among most of the Committee members on accelerating the current target to “lower the power generation cost to ¥7/kWh in FY2030” to between FY2025 to FY2027, setting the target purchase price for FY2022 through FY2024 to ¥8.5/kWh, and setting FY2025 to FY2027 as a specific timing for achieving a household solar PV purchase price of ¥11/kWh rather than “as soon as possible.” The Subcommittee will also discuss the auction system for all large scale solar PV and for wind power (onshore and offshore) going forward.

There is an urgent need to revise the auction system for renewable power to promote competition and to reduce costs by setting targets. However, economically rational renewable energies deployment cannot be realized unless these cost reduction efforts are combined with resolving constraints on connecting renewables to the grid and alleviating the risk of the renewable energy business by improving the predictability of curtailment, which are being discussed separately. Meticulous management will remain essential for renewable energies to become an economically-independent major energy source.

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