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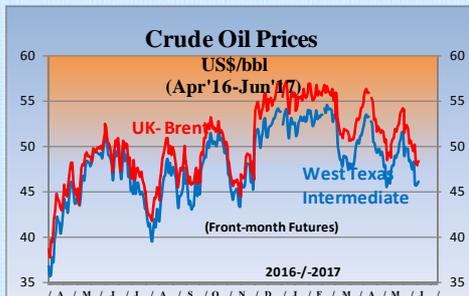
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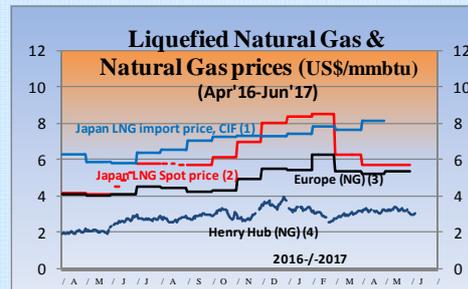
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Source: DOE-EIA, NASDAQ



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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Summary

【Energy Market and Policy Trends】

1. Developments in Nuclear Power

In a referendum on “Energy Strategy 2050” held in Switzerland, 58% of the population voted for the nuclear-free policy, renewable energies, and energy efficiency. The future of Switzerland’s existing nuclear power plants, which are known for their high safety, is uncertain.

2. Recent Developments in the Oil Market

On May 25, an extension of the joint production cut by OPEC and non-OPEC countries was announced. However, oil prices dropped because the market expected more aggressive agreement. With supply and demand almost in equilibrium, oil prices will remain sensitive to changes in oil inventory levels.

3. Recent Developments in Natural Gas and LNG Markets

Price competition is expected to intensify in the domestic gas market with the increasing entry of electric utilities. In the international LNG market, the restriction placed on LNG exports by the Australian government is attracting attention.

4. Update on Policies Related to Climate Change

President Trump announced the US withdrawal from the Paris Agreement. The US’s moves are affecting the international framework, including the Climate Change Conference in Germany.

5. A New Approach to the Construction of Hydrogen Energy Infrastructure

In the city of Leeds in central England, a project to switch the entire city from city gas to hydrogen is underway. Leeds’ initiative will offer useful insights for the introduction of hydrogen, which requires large-scale updating of infrastructure.



1. Developments in Nuclear Power

Tomoko Murakami, Manager
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On May 22, Kansai Electric's Takahama Unit 4 started operation, bringing the number of power plants permitted to operate under the new regulation standards to four. On May 24, Kansai Electric's Ohi Units 3 and 4 obtained a license, and 12 plants have now completed the safety assessment, including the three units that have been licensed to extend their operation. This number, however, is just under 30% of Japan's 42 existing plants, and is not high considering that five years have passed since the new regulatory standards came into effect. The review of construction plans and operation manuals remains extremely time-consuming, and the plants are unlikely to be restarted any faster.

In a referendum on "Energy Strategy 2050" held in Switzerland on May 21, a majority (approximately 58%) of the population voted for the revised Energy Act that promotes the nuclear-free policy, renewable energies, and energy efficiency. However, it must be noted that Switzerland decided to accept the nuclear-free policy as a result of opting for combining various renewable energies and energy efficiency measures to secure a stable supply of energy, unlike in Germany where safety concerns were the reason for abandoning nuclear power. In the wake of the referendum, an energy company Axpo, which considers that Beznau Unit 1, which started in 1969, is fit to operate until around 2030, argued that issues such as rising electricity costs due to soaring renewable capacities and the market design to achieve decarbonization without compromising energy security have not been fully debated, and that "a proposal for resolving the market distortion will be put forward promptly." The future of Switzerland's nuclear power, which has one of the highest capacity factors in the world and is competitive in the market, is uncertain.

After being elected as the 19th president of the Republic of Korea on May 9, President Moon Jae-in is yet to announce a definite direction for the energy policy. On May 25, Korea Hydro & Nuclear Power (KHNP) announced that it was temporarily suspending design work on the new Hanul Units 3 and 4, which were due to start construction in May, until the new administration has fixed its policy on nuclear new builds. KHNP explained that the reason for the suspension is "to minimize the various impacts of the unknown policy on the new Hanul Units 3 and 4," emphasizing that the suspension is only partial and that work for licensing is continuing. The direction of nuclear new builds must be monitored in light of the revision of South Korea's strategic energy plan scheduled for 2018.

While its cost-competitiveness and social acceptance are weakening in many developed countries, nuclear power is still a promising base source of electricity in some developing countries. On May 17, China National Nuclear Corporation (CNNC) reached an agreement with Argentina's state-run nuclear power company Nucleoeléctrica Argentina S.A. concerning the construction of the country's fourth nuclear power plant Atucha Unit 3, and a fifth plant, which will be a Hualong-1 of China. It may be more important for the nuclear industries and governments of Japan and the West to recognize the fact that even a country that has traditionally adopted the technologies of developed countries, such as Siemens (present Areva) and Atomic Energy of Canada Limited, is switching to China for its next plants, and to analyze why this is happening, rather than just emphasizing the highest levels of reactor safety in the world in their nuclear export strategy.



2. Recent Developments in the Oil Market

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On May 25, the OPEC meeting held in Vienna and agreed to extend the current six-month production cut, from January to the end of June this year, till the end of March 2018. On the same day, OPEC also had a meeting with ten non-OPEC oil producers including Russia, and also agreed on a nine-month joint extension. The scale of the reduction has not been announced officially, but is reported to be unchanged at approx. 1.2 mb/d for OPEC countries and approx. 0.6 mb/d for the ten non-OPEC countries. Nigeria and Libya continue to be exempted, and Iran reportedly plans to maintain its current output target of approx. 3.8 million barrels/day.

The extension comes as no surprise as the OPEC and non-OPEC participants in the joint production cut have been mentioning the possibility since March. The surprise was the magnitude of the fall in oil prices. Oil futures prices dropped by as much as 5% for both Brent and WTI on the 25th, closing at \$51/bbl and \$49/bbl, respectively. This reaction reflects widespread disappointment and selling, as the market had factored in a nine-month extension of the 1.8 mb/d cut since the beginning of May, and the focus was on whether the parties could agree on a larger or longer reduction, or both, and whether there will be any participants.

Behind the extension of the joint production cut and the disappointment in the market lie the greater-than-expected recovery of oil output and the historic inventory levels of the US. Since bottoming out in September 2016 at 12.29 mbb/d, US oil output has recovered strongly, reaching 12.93 mb/d in April this year. The number of operating rigs, which bottomed out at 316 in May 2016, has surpassed 700 as of May this year. The shale oil productivity is still improving, and some wells are reportedly profitable even the price of \$20s. As a result, investment in exploration and development is revitalized particularly in the Permian shale of Texas and New Mexico, and the IEA projects that the US's production will rise to as high as 13.49 mb/d in 2018 and 14.19 mb/d in 2022. Meanwhile, despite the joint production cut, OECD oil inventories remain around 4.6 billion bbl. Even considering that 35% of the inventories are government stockpiles, the pace of inventory reduction is slow, and the target of the countries participating in the joint reduction, namely a five-year average of 4.3 billion bbl, remains distant.

Supply and demand is almost balanced, and with the current solid demand, demand could exceed supply toward the latter half of this year, depending on the increase in US production and compliance with the production cut. As the OPEC and non-OPEC joint production cut and the US shale oil production hike remain in a tight contest, the market will turn its attention to the change in inventory levels. Prices are likely to remain sensitive particularly to the US Weekly Stock Report.



3. Recent Developments in Natural Gas and LNG Markets

Yoshikazu Kobayashi, Senior Economist, Manager
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Almost two months have passed since the start of full liberalization of the domestic gas market. Participants in the newly liberalized residential market are effectively limited mostly to utilities, as new participants must be capable of purchasing LNG competitively and must have the marketing power to sell gas to a broad residential consumer base. The utilities are now starting to fully enter the gas market.

As of May 5 this year, the number of cases of switching suppliers in the residential market has doubled from March 24 (approx. 92,000 cases) to 192,000 cases (less than 1% of the total) (the most recent switching rate for residential electricity is 5.5%). The increase is particularly sharp in the Kinki area, where more than 70% of switches have taken place. Further, the number has also sharply increased in the Chubu/Hokuriku area by 85% to approx. 29,000 cases in May from March, and the figure is steadily increasing.

In contrast, switching remains slow in the Greater Tokyo area compared to Kinki and Chubu at approx. 20,000 cases as of May. However, in May, Tokyo Electric released a new discount package for electricity and gas tariffs, and announced plans to fully enter the residential gas market of Greater Tokyo from July. The new plan combines electricity and city gas and offers an 8% discount in gas tariffs for the first year (the reduction falls to 3% from the second year). It will be interesting to see how the consumers of Greater Tokyo react to this plan. Going forward, the number of switches will be greatly affected by how much effort Tokyo Electric invests in media strategies. In the major gas market for mainly industrial use that was liberated earlier, 13% of the market is being supplied by new entrants (mainly utilities) as of 2015. It is not clear whether switching will reach this level for the residential market, but competition between electricity and gas companies will surely begin to affect prices going forward.

In the international LNG market, attention must be paid to the impact of the Australian Domestic Gas Security Mechanism (ADGSM) that the Australian government announced on April 27. This regulation was introduced to address the tightening supply of gas and the rise in domestic gas prices in Australia, particularly in the eastern region. Under the regulation, the Australian competition authorities closely monitor the domestic gas market, and when the Minister for Natural Resources and Mines considers that there is any risk of a gas supply shortage in the country, LNG exporters that do not meet certain conditions can be ordered to secure supplies for the domestic market (that is, reduce exports).

In reality, the regulation is expected to only impact one LNG project on the east coast, and will not directly affect supplies to Japan. However, the regulation is a considerable change in stance by the Australian government from its adherence to market principles, and the impact on the LNG market may not be small. The significance and implications of this great change in political stance, as well as any possible effects of the regulation on LNG supplies, must be closely monitored.



4. Update on Policies Related to Climate Change

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From the end of April to the beginning of May, the Trump administration discussed whether the US should leave the Paris Agreement or stay on with a weaker target. This discussion is related to the interpretation of Article 4.11 of the Agreement, which provides that “A Party may at any time adjust its existing nationally determined contribution with a view to enhancing its level of ambition...” The question is whether the “adjust” stated here only means upward adjustment or also allows weakening of the target.

White House Chief Strategist Stephen Bannon and EPA Administrator Scott Pruitt argue that the US should pull out of the Agreement as it does not allow a downward revision, while Assistant to the President Ivanka Trump and State Secretary Rex Tillerson hold that the Agreement does allow a downward adjustment and the target should be revised. The “leavers” believe that weakening the target would lead to lawsuits from the attorneys general and activists in liberal states, while the “remainers” believe that pulling out would seriously undermine the US’s position in the international community.

Such uncertainty concerning the US’s participation in the Agreement cast a shadow on the UNFCCC Climate Change Conference that started on May 8 in Bonn, Germany. However, on the same day, the White House announced that it was postponing the meeting planned for May 9 to discuss the US’s withdrawal from the Paris Agreement, and would not make a decision until after the G7 Summit scheduled for May 26 and 27.

The COP22, held in Marrakech, Morocco in November 2016, decided to conclude the work programme on “the rule book” for implementing the Paris Agreement by COP24 in 2018. Heading for this deadline, the Bonn Conference conducted the work and achieved “incremental” progress, including informal notes prepared by the facilitators for each agenda item to summarize the discussions and, regarding future work, conclusions to invite to make submissions and organize round tables.

This Conference also discussed the budget of the UNFCCC for 2018-2019. The draft budget from the UNFCCC Secretariat had proposed stopping funding for the Intergovernmental Panel on Climate Change (IPCC) due to financial constraints. The proposal, however, was rejected by the Parties, and consequently, it was decided to allocate 244,755 euros per annum, the same amount as 2016-2017. The US shoulders just less than 20% of the funds for UNFCCC, and both the IPCC and UNFCCC have been named by President Trump as targets for reduced funding. On June 1, President Trump announced the US withdrawal from the Paris Agreement. It could greatly affect the international climate regime, which must be closely monitored.



5. A New Approach to the Construction of Hydrogen Energy Infrastructure

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On May 19, Japan's major infrastructure companies, automakers, and financial institutions announced a new collaborative scheme for the full-scale construction of hydrogen stations. The details remain to be announced, but as a platform for collaboration, the parties will aim to establish a new company by the end of 2017. Behind this initiative is the delay in constructing hydrogen refueling stations. Whereas the Strategic Road Map for Hydrogen and Fuel Cells aims to construct 160 stations by FY2020, there are only 92 projects including planned ones, and only 80 stations have been completed as of January 2017.

While greater efforts are being made to build hydrogen refueling stations to accelerate the expansion of fuel cell vehicles, there are also new moves concerning fuel cell buses. Since the end of March, the Bureau of Transportation of the Tokyo Metropolitan Government has begun to operate commercially-available fuel cell buses, though only a modest two vehicles on a route. This is the first time in Japan for marketed vehicles to be used on commercial routes, though there are precedents in California and London. Having fixed routes, public buses can operate with a limited number of hydrogen refueling stations, thus avoiding having to construct numerous scattered hydrogen refueling stations as for other fuel cell vehicles.

The greatest challenge in building hydrogen refueling stations is that the price of hydrogen is unlikely to fall while the operation rate remains low. One way to resolve this challenge would be to supply hydrogen for other purposes aside from fuel cell vehicles. For example, in Berlin, hydrogen refueling stations are built to supply hydrogen to both fuel cell vehicles and fuel cell buses. Even then, however, the volume of hydrogen supply is limited. Another idea is to use hydrogen refueling stations as satellite for local energy supply.

To achieve this, however, it would be necessary to generate massive demand for hydrogen in the local community. Leeds, a city in central England, is running a project that aims to supply large amounts of hydrogen to the local community. Last summer, Northern Gas Networks drew up a plan to completely switch this city of 750,000 people from city gas to hydrogen energy. Hydrogen will be produced by reforming natural gas, and the carbon dioxide produced in the process will be stored in depleted gas fields in the North Sea (CCS). The project is scheduled to be completed between 2025 and 2030. Supplying hydrogen to local communities has been conducted on a very limited scale in Kitakyushu City, but Leeds' project is the world's first large-scale commercialization project involving an entire city. If a large demand for hydrogen can be generated, hydrogen refueling stations would be able to serve as a satellite base for supplying hydrogen to the local community, in addition to charging fuel cell vehicles, overcoming the economic inefficiency caused by the low operation rate.

As explained, involving both the transportation and residential sectors could be a viable strategy for expanding the use of hydrogen. The construction of hydrogen infrastructure has many challenges compared to existing infrastructure, such as economic efficiency and the need to develop and commercialize hydrogen-compatible equipment. The Leeds' initiative will offer interesting insights for the introduction of hydrogen, which requires large-scale updating of infrastructure.



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