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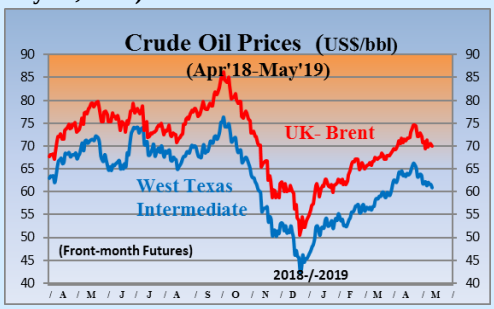
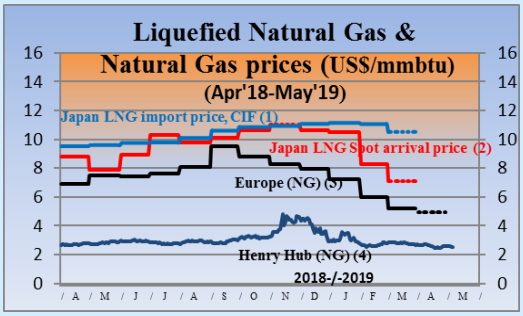
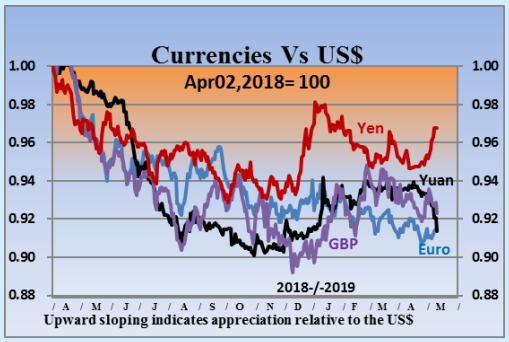


Sources:
(1) DOE-EIA
(2) Investing.com



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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1. Developments in Nuclear Power

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On April 4, Exelon Generation, owner and operator of the US Three Mile Island (TMI) Unit 1 nuclear energy facility, filed a report with the Nuclear Regulatory Commission (NRC) detailing plans to decommission the plant. TMI-1 is scheduled to end commercial operation prematurely in September this year, 15 years before its operating license from the NRC expires in 2034. Exelon Generation has selected SAFESTOR (safe storage) from among the three federally-allowed decommissioning options, securing additional time for radioactive decay after removing the nuclear fuel until 2074 to start dismantling the plant.

TMI suffered a major accident 40 years ago on March 28, 1979 in Unit 2, in which parts of the core melted. However, the adjacent Unit 1 continued to operate normally thereafter, achieving a capacity factor of 102.2% in 2018. As the reason for closing this strongly-performing plant, Exelon cites the current market design that fails to properly recognize the significant environmental and resiliency attributes associated with nuclear power, which contributes to the economy of Pennsylvania, and had requested the state to introduce zero-emission credits as New York and Illinois have done. The company stated that TMI-1 might cancel the scheduled shutdown if the state government decides to introduce this support policy. However, on May 7, it announced that TMI-1 will shut down by September 30 as previously scheduled, since it is clear that a state policy solution will not be enacted before June 1, in time to reverse the premature retirement of the plant.

The situation suggests that Exelon may have selected the SAFESTOR option to leave open the possibility for TMI-1 to restart in the future, foreseeing a possible change in the business environment.

On April 12, the Nuclear Regulation Authority (NRA) of Japan issued permission for the construction of specific safety facilities (facilities to prepare against terrorist attacks, etc. on nuclear facilities; hereafter “specific facilities”) for Kyushu Electric’s Sendai Unit 2. This is the second such permission following the one issued to Sendai Unit 1.

According to Kyushu Electric, more than 900 billion yen is being spent on safety measures at Genkai and Sendai nuclear power plants and the cost could rise further if future assessments result in design changes and additions. Regarding the cost-effectiveness of nuclear power, Kyushu Electric has said it recognizes that “the generation cost of nuclear power is similar to that of coal and LNG thermal power” based on the 2015 report of the Power Generation Cost Verification Working Group, and intends to “continue to control the cost of nuclear power and keep it competitive in the medium to long term by maintaining its high capacity factor through safe and steady operation.” However, the reality of the market is that no matter how safely or steadily nuclear power is operated, it may cease to be profitable or competitive depending on the wholesale price.

Amid increasing attention on electric utility companies’ decisions on whether to construct specific facilities, on April 17, a power company engaged in the construction of specific facilities informed the NRA that the facilities may not be completed within the required period of five years. The NRA replied at the meeting on April 24 that the extension of the period should not be permitted, which will result in shutdown of several reactors which have been already in operation for a few years. The course of future discussions must be closely monitored from the perspective of decision making by electric utility companies struggling in the competitive market.

2. Recent Developments in the Oil and LNG Markets

Tetsuo Morikawa, Senior Economist, Manager
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Brent surpassed $70/bbl on April 5 for the first time in five months. Behind this rise is the worsening situation in Libya in addition to production cuts by OPEC Plus. According to the International Energy Agency's monthly Oil Market Report, OPEC's March production declined to 30.13 mb/d, the lowest since 2014, with the compliance rate with the joint production cut reaching 153%. The decrease in OPEC's production is being driven by Venezuela's political turmoil and Saudi Arabia, which is cutting production by more than agreed and has signaled that the supply cuts will continue beyond June. Meanwhile, macroeconomic forecasts are increasingly uncertain, as shown by the downward revision of the 2019 global economic growth forecast of the International Monetary Fund to 3.3% on April 9. The US Federal Reserve Board has decided to slow the pace of rate increases in January and the European Central Bank has postponed the start of the rate increase till March next year. The macroeconomy, stock markets and other financial markets are likely to play a major role in the setting of oil prices in the second half of this year, alongside OPEC Plus' decision to extend the production cut.

Spot prices are falling significantly in the LNG market. The spot price for North East Asia has dropped from $8-9/MMBtu at the beginning of the year to around $4 in March and early April. It is drifting further away from Japan's average LNG import price, which is based mostly on term contracts and is estimated at around $10-11 for March and April. While most of Japan's term contract prices are linked to oil prices, there are other pricing methods in Asia, such as the spot price which is based on the spot supply-demand balance and the Henry Hub-linked price for American LNG. The above price difference is mainly due to the increase in LNG supply capacity which caused spot prices to ease under such pricing environment. On April 3, it was reported that the LNG contract signed by Total and the US Tellurian is linked to JKM (Japan Korean Marker) of Platts, the spot price for North East Asia. The spot price may not always be the lowest; however, with such a large difference between the spot and term prices, any buyer that excludes spot prices from its pricing portfolio may be missing opportunities.

On April 10, the 15th Japan-Taiwan Energy Seminar was held. The Ministry of Economy, Trade and Industry and the Institute of Energy Economics, Japan (IEEJ) represented Japan, while the Bureau of Energy of the Ministry of Economic Affairs, Taiwan Power Corporation, CPC Corporation, and the Taiwan Institute of Economic Research represented Taiwan to discuss energy policies, electric power, renewable energies, global warming countermeasures, and natural gas. On April 18 and 19, the IEEJ, the Energy Research Institute of the National Development and Reform Commission of China, and the Korea Energy Economics Institute of South Korea held a joint workshop and seminar on the energy transition strategies of Japan, China, and South Korea and regional cooperation among them. In both seminars, the possibility of regional cooperation to maintain and pursue low prices for natural gas was discussed. North East Asia is a key LNG importing region that has great potential for collaboration, including in joint LNG project development, procurement, and efforts to abolish destination clauses. Public-private efforts in each country are needed to fully exploit this potential.

3. Update on Policies Related to Climate Change

Takahiko Tagami, Senior Coordinator, Manager
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On April 2, the Meeting on Long-Term Strategy under the Paris Agreement as Growth Strategy convened its fifth meeting following the fourth meeting on December 21 last year, and decided its recommendations. The recommendations focus on promoting innovation while covering recent climate policies, perspectives in formulating the long-term strategy, the key components that should be incorporated in the long-term strategy, a future vision in each sector, and cross-cutting policies and measures.

As the perspectives in formulating the strategy, the recommendations state: (1) contribute to achieving the 1.5°C goal as a member of the international community; (2) work by the world as a whole is necessary for resolving climate change issues, and disruptive innovations including CCS/CCU, hydrogen, solar power satellite, and next-generation nuclear power are essential; and (3) Set “a vision of the future society” not from the bottom up and make efforts towards achieving it.

Further, the followings were indicated as key components that should be incorporated in the long-term strategy: (1) aim for achieving a “decarbonized society” as “a vision of the future society” as soon as possible in the second half of this century and reduce GHG emissions by 80% by 2050,, and (2) formulate a comprehensive strategy with specific targets on cost and efficiency for key areas of innovation.

As the future vision in each sector, the followings were presented regarding energy: (1) work on the reduction of CO_2 emissions from coal-fired power plants in align with the long-term goals of the Paris Agreement; (2) lower the cost of producing CO_2-free hydrogen to one-tenth of the current level by 2050; and (3) establish a CCU technology at a commercial scale within a few years and deploy CCS/CCU by 2030 with a view to exporting it.

Regarding cross-cutting policies and measures, the recommendations highlighted (1) innovation, (2) green finance, and (3) the export of products and technologies with a high environmental performance and international cooperation, and recommended: innovation in market, infrastructure, institutions and regulations is important for deploying innovative technologies; to invite leaders in science and technology around the world to Japan (RD20 international conference); companies should disclose their efforts in a transparent manner using the Guidance formulated by the Ministry of Economy, Trade and Industry on the recommendations of the Task Force on Climate-related Financial Disclosures; and co-innovation with partner countries which transform the seeds of innovation created in Japan into business models that can be deployed in the partners’ societies. Regarding carbon pricing, the recommendations stated that expert and technological discussions are needed, taking into account how carbon pricings work in other countries, national circumstances in Japan and the impact on the international competitiveness of industry.

The recommendations were incorporated in the draft long-term strategy which the government presented on 23 April. The final long-term strategy is planned to be submitted before the G20 summit and ministerial meeting in June 2019 in Japan.

4. Update on Policies Related to Energy Conservation

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Major international oil and gas companies (IOCs) of Europe and the United States are purchasing more and more EV charging-related companies. In January 2019, Royal Dutch Shell announced the purchase of Greenlots, a company which is engaged in a comprehensive EV charging-related business, including smart charging systems featuring the efficient use of electric current with limited amperage and electric tariff pricing options that maximize the income of consumers depending on changes in wholesale prices. In 2018, Total purchased France's smart EV system operator G2mobility and Chevron announced that it would invest in ChargingPoint which runs an EV charging business. These moves by IOCs are intended to seize new business opportunities amid the electrification of transportation, and to transform into a comprehensive energy industry.

In 2018, 410,000 EV units were sold in Europe, up 33% year-on-year. In the United States, sales soared to 360,000, up 81% year-on-year, driven by sales of Tesla's popular Model 3 series.

At the end of 2018, India's Ministry of Power released the Charging Infrastructure for Electric Vehicles - Guidelines & Standards aiming to create infrastructure that will support the expansion of EVs. The key points of the Guidelines are: (1) The setting up of charging stations shall be a de-licensed activity and any individual or entity may set up public charging stations after registering; (2) Charging stations may obtain electricity from any generation company through open access; and (3) The maximum price of electricity shall be the average electricity price plus 15%.

In India, EV chargers are expected to be concentrated in cities where land acquisition is expensive and difficult. The mandatory use of one of the five standard charging cables specified by the guidelines for both high- and low-speed charging will also push up costs. Consequently, the charging business is unlikely to be feasible as things stand unless the burden on operators is eased through subsidies or other means. Meanwhile, it is important that India, as an emerging Asian country with a target for introducing ZEVs, took the initiative to present the need to formulate guidelines.

In Japan, the revised Building Energy Efficiency Act was approved by the Cabinet on February 15. With this approval, the scope of application of the energy conservation standards will be expanded from large buildings (floor area of 2,000 m^2 or more) to new medium-sized non-residential buildings (floor area of 300 m^2 or more). Meanwhile, small houses and buildings with a floor area of less than 300 m^2 were exempted from the revised Act. This decision is presumably based on the current situation in which many operators are not familiar with the energy conservation standards, as shown by the low compliance rate of 57-69% among small houses and buildings. As stipulated in the revised Act, it is important to start by raising recognition of the standards for improved compliance by: (1) reinforcing oversight of plans for apartments and condominiums, and (2) establishing a system to require architects to brief their clients who are building detached houses on energy conservation performance.

Further, as a new incentive, (3) office buildings whose energy conservation performance is improved through collaborative efforts by multiple buildings (e.g. sharing a heat source and battery cells by introducing co-generation) will be allowed to subtract the floor area of the facilities from that of the buildings.

5. Update on Renewable Energies

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On April 1, the Bill for the Act of Promoting Utilization of Sea Areas in Development of Power Generation Facilities Using Maritime Renewable Energy Resources, which had been adopted on November 30 last year, went into effect. The law aims to facilitate the introduction of offshore wind power, which it is hoped will achieve the goal of the Third Basic Plan on Ocean Policy of "promoting the development of ocean resources and expanding the use of renewable energies" and of the Fifth Strategic Plan of "making renewable energies a major power source."

In other countries, the cost of offshore wind power is coming down quickly and the number of successful unsubsidized bids is increasing. There are high expectations for this energy source, which, unlike land-based wind power and mega solar PV, is free of physical land-related constraints and is thus more open to large-scale development. However, it is not expanding in Japan as quickly as hoped, possibly because of the lack of unified rules for long-term occupation of general sea areas and of a framework for making adjustments with existing users such as fisheries.

The designation of special development zones and the criteria for selecting operators stipulated in the Act have been discussed in the joint meetings of the Working Group for Promoting Offshore Wind Power (Ministry of Economy, Trade and Industry) and the Offshore Wind Power Promotion Subcommittee (Ministry of Land, Infrastructure, Transport and Tourism) since December last year, immediately after the Bill was adopted. At the end of March, a draft interim proposal on operating rules was submitted.

This interim proposal includes criteria for the designation of special promotion zones such as (1) natural conditions that are suitable for the power generation facilities to achieve a high capacity factor, a generation capacity of an adequate scale, low business costs, and safety, (2) absence of adverse impacts on preservation zones, shipping routes, and fisheries, and (3) prospects for securing grid connection, which all go without saying. One notable point is that the criteria refer to the combined use of a promotion zone with a port which serves as the base for developing the zone. The proposal suggests that the criteria for selecting operators should include the economic benefits on the regional economy associated with long-term maintenance and other factors, while noting that the price of electricity supplies should be the most important factor.

In the offshore wind power business, it is desirable in terms of cost for the development zone to be located near a port, where oversized construction materials and equipment can be stored, carried in and out, assembled, maintained, and managed in one place. The development of industries and the creation of jobs around ports are another important factor. In fact, the combined use of promotion zones and ports, and contribution to the local economy, have both been achieved in Denmark, the UK, and Germany, among others.

Japan lags behind Europe and China in terms of offshore wind power, and one of the oft-cited reasons is its deep seas. Accordingly, the target development scope includes floating wind power plants with a depth of 50 to 100 meters, which are considered to be more economical than bottom-mounted plants that require large-scale civil engineering. To promote the introduction of offshore wind power, in addition to developing technologies, operational rules for promotion zones should be established as quickly as possible while attaching high importance to economic benefits and effects, as proposed in the joint meeting.

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