



IEEJ e-NEWSLETTER

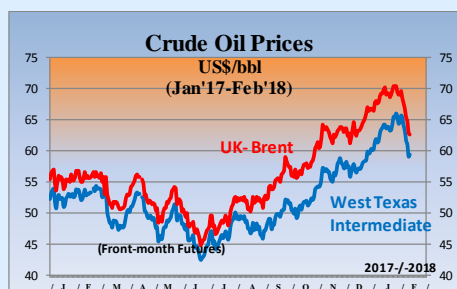
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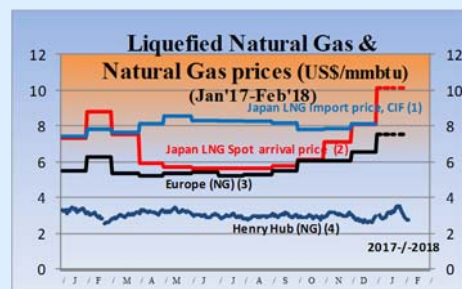
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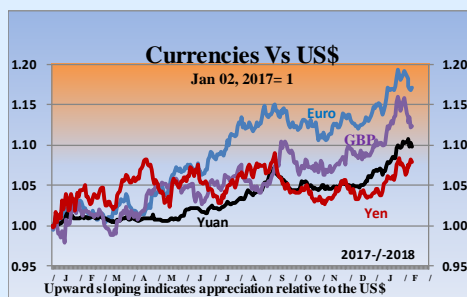


Source: DOE-EIA, Financial Times, NASDAQ

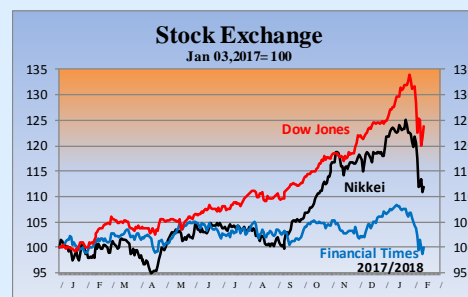


Sources:

- (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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Summary

【Energy Market and Policy Trends】

1. Developments in Energy Policies

On December 26, 2017, the 23rd Strategic Policy Committee Meeting was held to discuss nuclear power generation, thermal power generation, fossil fuels, and heat for establishing the Strategic Energy Plan.

2. Developments in Nuclear Power

A Canadian investment fund purchased a 100% stake in Westinghouse, and EDF became the top shareholder of Framatome (former Areva NP). Attention must be paid to the strategies of the two in the international nuclear power market.

3. Recent Developments in the Oil and LNG Markets

Oil prices have surged since the beginning of 2018, with Brent surpassing \$70. However, inventory could rise again as the US boosts production and put downward pressure on oil prices.

4. Update on Policies Related to Climate Change

At the end of last year, the National Development and Reform Commission (NDRC) of China announced its programme for building a national carbon emissions trading market (power sector), publication of which had been delayed. How the system will be developed through 2020 must be monitored.

5. Update on Renewable Energies

In recent years, various efforts have been under way in Australia for building a renewable hydrogen supply chain. Japan, which aims to build a hydrogen energy society, must closely follow the developments.



1. Developments in Energy Policies

Akira Yanagisawa, Senior Economist, Manager
Energy and Economic Analysis Group
Energy Data and Modelling Center

On December 26, 2017, the 23rd Strategic Policy Committee Meeting was held to discuss nuclear power generation, thermal power generation, fossil fuels, and heat. The meeting also included reports on COP23 and the climate change summit by the Ministry of Foreign Affairs and on the progress of discussions on the mid- to long-term goals by the Ministry of Environment.

The organizers mainly discussed measures that are already under way. Similarly, Committee members' comments, which mostly focused on nuclear and coal, changed little from before, with few new views. However, Fukui Governor and Committee member, Kazumi Nishikawa, cited a media report questioning the Strategic Energy Plan's lack of plans regarding nuclear power generation, and emphasized that communities which host nuclear power plants are critical of the government's stance. This comment suggested a growing sense of alarm in hosting communities, especially as Mr. Nishikawa is known for his gentlemanly comments.

Regarding the sense of alarm, we are often reminded of the critical views of the international community, particularly in Europe, toward the use of coal. There was a comment that the target share of coal in the power generation mix is too high and should be reduced. However, we must consider why Japan needs to use coal. The important point for addressing climate change is to control GHG emissions sustainably, rather than fundamentally reject the use of coal. There was also a comment that the international community may not understand Japan's stance on coal. If Japan does not change the basic structure of the Strategic Energy Plan, it will be essential to conduct effective international public relations.

IEEJ Chairman & CEO Masakazu Toyoda commented as follows:

- (1) It is generally accepted in Europe and the United States that the risk of nuclear power generation can be controlled to an acceptable level, even though, like all other energies, it may not be risk-free. I hope that Fukushima will be reconstructed as a remarkable example to the world, a mecca for decommissioning technologies. (2) The Hiroshima High Court's decision to suspend Ikata Unit 3 is far from international norms and is very regrettable. The role of the judiciary on this issue should be investigated internationally and objectively with the help of OECD/NEA, and the outcome should be shared with the Japanese public. (3) Maintaining the nuclear industry and building and expanding power plants are urgent challenges for Japan. Without a clear vision for the industry, it cannot attract young people.
- Even though coal is under attack in COPs, Japan should not hesitate to emphasize that its technologies are making coal-fired power generation more efficient around the world. However, as moves to abandon coal will accelerate from 2030, in expanding Japan's transfer of coal technologies to emerging countries, they should be provided together with the concept of energy mix as software, to avoid being misunderstood by the international community.



2. Developments in Nuclear Power

Tomoko Murakami, Manager
Nuclear Energy Group, Strategy Research Unit

On January 4, Canada-based investment fund Brookfield Business Partners (BBU) announced that it will purchase a 100% stake in Westinghouse, now undergoing reconstruction under US federal law, for 4.6 billion dollars. In the US, where plants with an excellent operational history sometimes have to close due to falling electricity demand and low wholesale electricity prices, even existing plant businesses are not safe. Nuclear new builds entail even greater risks including a longer licensing period and thus lower prospects for recouping costs, so it is natural to wonder why BBU decided to purchase WEC at this price. We should note BBU's sharp analysis in its press release on the same day that WEC enjoys a steady cash flow from maintaining its nuclear facilities around the world. Stakeholders in Japan should track which businesses and in which markets WEC will operate as it regroups itself under BBU.

In the US, existing nuclear plants continue to face headwinds. On January 11, the California Public Utilities Commission approved the plan submitted in August 2016 by utility Pacific Gas and Electric (PG&E) to close its Diablo Canyon Unit 1 and 2. With a capacity factor of 100% for Unit 1 and 91% for Unit 2 in 2016, both units certainly have no technological issues. The decision is based on the state government's policy shift to renewables and energy efficiency, and the situation must be monitored to determine whether this is an issue specific to California or will affect other states.

French nuclear firm Areva completely overhauled its corporate governance. Former Areva NP changed its name to Framatome, with Electricite de France (EDF), Mitsubishi Heavy Industries and engineering firm Assystem holding stakes of 75.5%, 19.5%, and 5%, respectively. The very first policy announced by Framatome was to enhance collaboration with Chinese nuclear firm CNNC in the fuel business. With the stakeholders having different aims, Framatome will have tough decisions to make in managing the company.

Further, Russian firm Rosatom is building a steady track record in the international nuclear power market which Framatome and WEC will enter. Regarding reactor design, which of the following reactors with a similar reactor type and output will be chosen by emerging countries, Hualong1, ATMEA1, VVER, or AP-1000? Each side needs to not only demonstrate the strengths of their product, but to establish a strategy by carefully analyzing the needs of emerging countries for assistance in finance and infrastructure-building.

In Japan, the Nuclear Energy Subcommittee resumed on January 16, and ways of regaining public trust were discussed. Despite the strenuous public relations efforts by the government and power companies since the Great East Japan Earthquake, public trust in nuclear power has hardly improved. Sincere efforts by the power companies based on their firm resolve to continue their businesses will be an important key for regaining trust.



3. Recent Developments in the Oil and LNG Markets

Tetsuo Morikawa, Senior Economist, Manager
Oil Group
Fossil Fuels & Electric Power Industry Unit

Oil prices have surged since the beginning of 2018. On January 11, Brent surpassed \$70/bbl for the first time in over three years due to the drawdown of inventory in the US and rise of Middle East risk. Rebalancing is certainly making progress due to the OPEC/non-OPEC production cut and robust demand. However, it is not clear how long the price rise will last, largely due to the growth potential of shale oil production. The number of drilled but uncompleted (DUC) wells in shale oil fields is at an all-time high, with active hedging by producers in the WTI futures market. The International Energy Agency predicts in its monthly report on January 19 that US oil output will surpass 10 mb/d within 2018 (9.78 mb/d as of 2017). Depending on demand growth, inventory levels could start rising again and put downward pressure on prices.

In the LNG market, the spot LNG price in Asia hovered around \$10-11/MMBtu in January as the market responded to the supply crunch of natural gas in China. As spot prices have relatively low influence in the Asian LNG market, unlike oil, the average import price remains around \$8/MMBtu in Japan where long-term contract prices are dominant. The supply-demand balance will remain relaxed in 2018 as new projects start in Australia and the US. However, the oversupply is shrinking, albeit slowly, due to the enormous potential for higher demand in China and other emerging LNG importers.

In the medium to long term, aggressive policies and corporate strategies to expedite the expansion of zero-emission vehicles (ZEVs) since mid-2017 suggest that oil demand could peak sometime in the future. Royal Dutch Shell CEO Ben van Beurden predicted last July that oil demand will start to fall between the late 2020s and early 2030s, and the IEA's World Energy Outlook 2017 issued last November forecasts that oil demand will peak around 2020 under its Sustainable Development Scenario. IEEJ also examined the impact of a significant expansion of ZEVs in the oil demand peak scenario of IEEJ Outlook 2018 published last October. The study predicted that oil demand will peak around 2030 but will remain at 2015 levels even in 2050, and suggested that substantial upstream investments should be maintained.

On January 11, the 23rd Natural Resources and Fuel Committee meeting of the Advisory Committee for Natural Resources and Energy was held to discuss the strategies and policies that companies and the government should take in light of the medium- to long-term changes expected in and outside Japan. As previously mentioned, even if oil demand peaks around 2030, the world will continue to need large amounts of oil even in 2050. In resource diplomacy, Japan should seek mutual development with oil-producing countries through initiatives such as producing carbon-free hydrogen from fossil fuels and capturing the Asian demand growth with oil companies of oil-producing countries.



4. Update on Policies Related to Climate Change

Takahiko Tagami, Senior Coordinator, Manager
Climate Change Policy Research Group
Global Environment and Sustainable Development Unit

On December 18 last year, the National Development and Reform Commission (NDRC) of China announced the programme for building a national carbon emissions trading market (power sector), the publication of which had been delayed. According to the programme, the market will be constructed in phases, starting with the launch of a national carbon emissions trading system solely for the power sector (including combined heat and power), and gradually expanding the scope of covered sectors and increasing traded products, to complete the carbon emissions trading market. The system will be operated in coordination with related policies and measures, such as the double control of total energy consumption and energy intensity.

The key points of the announcement are:

- The entities participating in the market will be key emitters of the companies in the power sector (including in-house power generation systems in other sectors) with annual emissions of 26,000 tonnes or more. The scope of key emitters will be expanded in stages.
- Emission allowances in the power sector will be allocated based on the allocation standard and method to be established by the National Development and Reform Commission (NDRC) of the State Council jointly with the National Energy Administration. (Quotas will not be allocated beforehand; instead, only the benchmark emissions intensity per unit power will be decided in advance, which will be multiplied by the actual power output after a set period to determine the quota.)
- Regarding the products to be traded, only spot trading will be allowed; futures will not be traded initially. Once the environment has matured, domestic credits that have been issued since 2012 will be added into the market.

As for the future schedule, the emissions trading market will be constructed in three phases. First, approximately one year will be spent to complete the systems for reporting, registry, and trading, and for the capacity building of related entities to improve their capability to participate in the market and to manage their emissions (foundation-building period). Then, roughly another year will be spent on simulation trading of emissions allowances in the power sector (simulation-operation period). Finally, spot trading will start between transacting entities in the power sector (deepening and completion period). Further, to be able to scientifically set standards for allocating quotas, associations in relevant sectors are being encouraged to work on collecting the statistics of carbon emissions for their sectors. Entities of a regional pilot emissions trading scheme that meet the conditions for a key emitter above will be integrated into the national market as appropriate, but the regional pilot schemes will continue until they are integrated into the national market when the environment matures.

Regarding international climate actions, on January 19, Saudi Arabia's King Abdullah Petroleum Studies and Research Center (KAPSARC) and the Global Energy Institute of the American Chamber of Commerce co-hosted a seminar titled "Climate Governance after the Paris Agreement" in Washington DC, in which IEEJ Chairman & CEO Masakazu Toyoda participated. The discussions included the relationship between energy policy and climate policy for achieving the UN's sustainable development goals, a pragmatic approach to climate policy to minimize the three costs (mitigation, adaptation, and damage), and the importance of technology development and transfer initiatives in breaking out possible technology cul-de-sac.



5. Update on Renewable Energies

Yoshiaki Shibata, Senior Economist, Manager
New and Renewable Energy Group
New and Renewable Energy & International Cooperation Unit

In recent years, various efforts have been under way in Australia for building a renewable hydrogen supply chain. The country is also openly committed to exporting hydrogen in addition to producing and using it, and the commitment is linked with Japan's efforts for building a hydrogen energy society.

First, in September 2017, the State of South Australia formulated a hydrogen roadmap titled "A Hydrogen Roadmap for South Australia." The resource for producing hydrogen is renewable energies. With abundant solar PV and wind power resources, South Australia is keen to introduce more renewable energies, and aims to increase the ratio of hydropower and other renewables in its power output to 50% in 2025 from the present 43%. Achieving this target requires introducing large amounts of renewables whose output fluctuates, and hence, measures to stabilize the power grid. Such efforts for grid stabilization include the construction of a 150 MW solar thermal power plant that can also store energy and the launch of a 129 MWh mega lithium-ion battery by Tesla, both announced last summer. Hydrogen production from renewables, alongside these measures, is a means to ensure grid stability and achieve the 2050 zero emissions target. Further, this plan considers exporting the hydrogen produced.

Such efforts are not limited to the state government. At the federal level, last December, the Australian Renewable Energy Agency (ARENA) set up a 20 million Australian dollar subsidy (approx. 1.8 billion yen) for R&D projects for building a renewable hydrogen export chain, and is currently accepting applications. Australia considers renewable hydrogen as a new export resource following coal and natural gas. Japan, South Korea, and China are listed as possible export destinations.

The Commonwealth Scientific and Industrial Research Organization (CSIRO), a government research institute, is also actively engaged in R&D of renewable hydrogen. It is considering synthesizing ammonia from the hydrogen produced from renewables and exporting the product to Japan and other countries. Specifically, CSIRO is studying and developing a technology for separating hydrogen from ammonia.

So far, Australia has been pursuing the production of carbon-free hydrogen by combining the gasification of brown coal, found in abundance in the State of Victoria, with CCS, and exporting the liquid hydrogen to Japan. However, as described above, hydrogen from renewable energies with its vast potential is likely to be studied in parallel as a realistic option.

Hydrogen, which can be produced from various energy resources through different technologies, could give rise to many more projects, promoting competition among different technological options and consequently bringing down costs. Aiming to build a hydrogen energy society, Japan must pay close attention to the development of the initiatives in Australia.



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IEEJ e-Newsletter Editor: Yukari Yamashita, Director
IEEJ Newsletter Editor: Ken Koyama, Managing Director
Inui Bldg. Kachidoki, 13-1 Kachidoki 1-chome, Chuo-ku, Tokyo 104-0054
Tel: +81-3-5547-0211 Fax: +81-3-5547-0223



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