



IEEJ e-NEWSLETTER

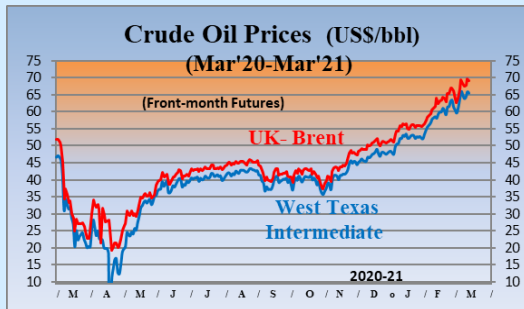
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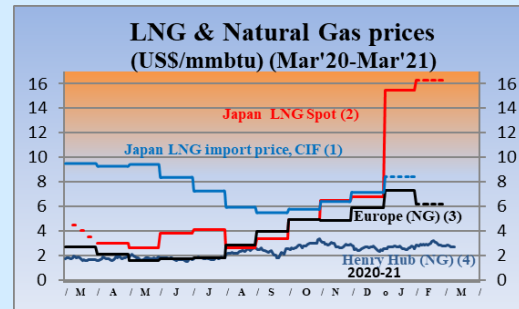
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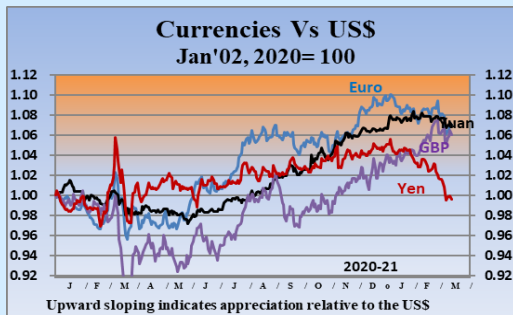
(As of March 12, 2021)



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 (Netherlands Title Transfer Facility)
(4) DOE-EIA, NYMEX (Front-month Futures)



Source: x-rates.com



Sources:
(1) Finance. Yahoo.com
(2) Investing.com

Contents

Summary

【Energy Market and Policy Trends】

1. Energy Policies
2. Developments in Nuclear Energy
3. Recent Developments in the Oil and LNG Markets
4. Update on Policies Related to Climate Change and Energy Conservation
5. Update on Renewable Energies



Summary

【Energy Market and Policy Trends】

1. Energy Policies

At the Strategic Policy Committee meeting, an opinion was expressed that CO₂ emissions will persist in some domains despite maximum energy efficiency and decarbonization efforts, and that carbon neutrality cannot be reached without using carbon dioxide removal technologies.

2. Developments in Nuclear Energy

The European Parliament passed a resolution to block the commercial launch of Belarus' Ostrovets Unit 1, claiming that the plant does not meet Europe's earthquake-resistance and other safety standards. A rational explanation of the reasons is awaited.

3. Recent Developments in the Oil and LNG Markets

Oil prices are rising due to monetary easing in response to Covid-19 and the drop in output in the southern US due to freezing weather. The European oil industry has begun to launch full-scale efforts to transform the existing business portfolio to achieve net-zero emissions.

4. Update on Policies Related to Climate Change and Energy Conservation

The 30th Energy Efficiency and Conservation Subcommittee held on February 19 discussed the specific problems with demand-side initiatives and the countermeasures for them in response to the 2050 carbon neutrality policy.

5. Update on Renewable Energies

The power supply crunch this winter highlighted the need to respond to “dark doldrums,” a situation in which variable renewable electricity becomes unavailable in large areas for extended periods due to climate conditions.



1. Energy Policies

Shigeru Suehiro, Senior Economist, Manager
Econometric and Statistical Analysis Group
Energy Data and Modelling Center

On January 27, the 2050 carbon neutrality target was discussed at the 36th Strategic Policy Committee meeting under the Advisory Committee for Natural Resources and Energy. The moderator shared the view that CO₂ emissions will persist in some domains despite maximum efforts on energy efficiency and decarbonization, and so carbon neutrality cannot be achieved without adopting negative emission technologies such as direct air capture with carbon storage (DACCS).

At the start of the meeting, the moderator reported on the electricity supply crunch in the first half of January. The shortage was caused by soaring electricity demand and a drop in solar PV output due to the cold weather, which coincided with an LNG supply shortage. The moderator explained that it had been necessary to secure the capacity for meeting kW requirements and resources for producing the necessary kWh at the time. The comments from members underscored the difficulty of achieving CO₂ reduction and a stable supply simultaneously, and the lack of a perfect energy source.

In the discussion on carbon neutrality, members exchanged opinions on the decarbonization of the final consumption segment. The moderator presented the issues and the way forward for the industrial, residential and commercial, and transportation sectors, respectively, and explained that carbon removal technologies will be needed to address any CO₂ that persists. Many members pointed out the limits of electrification and the importance of addressing the demand for heat, and said that in developing and implementing energy efficiency and decarbonization technologies in society, it is essential to determine the competitiveness of industries and provide economic assistance. Opinions were expressed on various topics including inter-ministerial and inter-regional collaboration, energy management, utilization of forests, and changing consumer behavior. Since the demand side covers a broader range of areas than the supply side, the discussions seemed somewhat directionless and unspecific.

Lastly, there was a discussion on how to conduct scenario analysis. It is planned to conduct calculations for multiple scenarios to clarify the path toward carbon neutrality. Members requested that the scenarios and evaluation criteria should be set clearly and said they need information on how people's daily lives and businesses would change under each scenario. There was also an opinion that the analyses should be conducted in such a way that they can identify concrete problems.

IEEJ Chairman and CEO Masakazu Toyoda commented as follows:

- It is important to set clear benchmarks and depending on the area, to make them mandatory. In addition, thorough assistance must be provided not only to the supply side for R&D but also to the demand side for commercializing technologies.
- International cooperation is important. For instance, for hydrogen, collaboration between producer and consumer countries is important for reducing costs, but for market expansion, collaboration among consumer countries is indispensable. This is a high hurdle to overcome for the private sector alone, and the government will need to take the lead.
- Carbon neutrality cannot be reached overnight, and so it is necessary to consider what measures to take during the transition period. Discussions on coal-fired thermal power, for example, tend to be yes-or-no debates, but a roadmap on how to approach and actually achieve carbon neutrality is needed.
- Japan must demonstrate leadership in international rule-making. Europe tends to be negative toward fossil fuels, and Japan is a leading proponent of decarbonizing fossil fuels.



2. Developments in Nuclear Energy

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

On January 23, shortly after taking office, US President Joe Biden appointed Christopher Hanson, a member of the Nuclear Regulatory Commission (NRC) and the Democratic Party, as NRC Chairman. Former Chairman Svinicki supported the Republican Party, which led to environmental groups criticizing the NRC as being overly supportive of the nuclear industry during the Trump era. There have been some media reports claiming that the change in the Republican/Democrat composition of the Commission is likely to change its regulatory stance. However, in light of the “Principles of Good Regulation (independence, openness, efficiency, clarity, and reliability)” advocated in the NRC’s vision, the regulatory stance should not change at all, regardless of which party the chairman or commissioners support.

There were no particular delays in regulatory activity during the Trump era, as shown by the issuance of first-time lifetime extension licenses for five reactors of four power stations including Indian Point Units 2 and 3 and second-time licenses for four reactors of two plants, extending their lifetime to up to 80 years. Whether the recent appointment will cause any changes in screening for lifetime extensions must be watched.

On February 11, the European Parliament passed a resolution to block the commercial launch of Belarus’ Ostrovets Unit 1 with 642 votes in favor, 29 against, and 21 abstentions. The Parliament claimed that most of the findings from the 2018 stress test on the plant by the European Nuclear Safety Regulators Group (ENSREG) are unresolved and has strongly requested that ENSREG and the Belarussian regulators hold in-depth discussions before starting commercial operation of the plant. Meanwhile, the Belarussian side has explained that the construction and test operation of Ostrovets Unit 1 are entirely in accordance with the IAEA’s safety standards and principles, directly refuting the Parliament’s claims that the plant does not meet international safety standards. In fact, Belarus has undergone IAEA reviews such as the Integrated Nuclear Infrastructure Review (INIR). The European Parliament should present a rational reason for blocking the commercial operation of a reactor of a sovereign state.

As freezing weather hit electricity infrastructure in Texas and other states in southern US, before dawn on February 15, Unit 1 of the South Texas Project (STP) nuclear power plant in Texas shut down automatically. According to a spokesperson of STP, the shutdown was caused by a pressure gauge on the secondary feedwater system sending an erroneous signal as the facility was not prepared for the freeze. After confirming that the plant had no anomalies, STP’s operator commenced reactor start-up on the 17th and the plant returned to 100% output on the 19th. The other three reactors in Texas are operating normally. The incident this time highlighted the importance of preparing for extreme weather (low temperature) for nuclear power, which has been believed to be highly resilient in times of disaster and other emergencies due to the ease of fuel storage. The lessons learned from this incident will lead to objective discussions to build an appropriate and resilient power system .



3. Recent Developments in the Oil and LNG Markets

Yoshikazu Kobayashi, Senior Economist
Planning & Administration Unit

International oil prices, including Brent, have climbed by more than 20% since the start of the year and are around the mid-60-dollar range as of late February. Like the recent surge in stock prices, the increase in oil prices resulted from excess liquidity due to the Covid-related financial easing, which caused funds to flow into the crude oil market, combined with the partial shutdown of oil production caused by the freezing weather that hit the southern US. Wall Street is starting to speculate on “super cycle” of commodity prices as various countries continue to deploy economic packages and as upstream investment slackens, but the future remains uncertain as the global oil demand has not returned to pre-Covid levels and OPEC Plus has abundant surplus capacity. The next point to watch is OPEC Plus’s point of view on the current level of production cuts as oil prices recover.

Many companies in the global energy industry have begun to commit to a net-zero carbon emissions target. On February 11, Shell set out details of how it will achieve net-zero emissions by 2050. In addition to renewable power generation and EV charging businesses and decarbonization measures such as CCS and biofuels, the company plans to expand its business in lubricants and chemical products, which do not generate emissions during consumption. Further, the company says its oil production peaked in 2019 and will be declining. By declaring that it will pull back from the oil business, the traditional source of earnings, Shell is pushing to transform into a company with a completely different business portfolio. There is a difference between US firms and European ones in terms of global energy companies’ commitment to carbon neutrality. European companies including Shell, BP, Total, ENI, Repsol, and Equinor have not only declared their 2050 net-zero targets but also indicated a schedule with specific numerical targets for interim measures, for example, for 2030. Meanwhile, interest in decarbonization is still relatively low among US companies, including ExxonMobil and Chevron, and those that have committed to 2050 net-zero targets, such as Occidental, are still in the minority. This difference reflects the political and financial market differences between regions related to decarbonization efforts to date.

In the oil downstream sector, refineries continue to shut down in developed countries. On February 10, ExxonMobil announced the closure of its Altona refinery in Australia. With this closure, the number of refineries in Australia will reduce from seven in 2010 to just two. The Australian government has been subsidizing refineries based on their output of major oil products since 2020 to protect them and ensure energy security, but the Australian refining sector has been driven into further difficulties with the Covid-induced decline in demand, in addition to competitive imports from the Middle East and Asia. Australia’s petroleum stockpiles have long been below the levels required of IEA members; the closure of refineries may cause domestic stockpiles to shrink even further and heighten energy security risks.

On February 8, in the LNG market, Qatar Petroleum made the final decision to invest in new production capacity. It is an enormous project that will spend \$28.75 billion to boost the company’s production capacity from 77 million tonnes to 110 million, with production scheduled to begin in Q4 of 2025. The company is considering boosting its capacity even further to 126 million tonnes thereafter.



4. Update on Policies Related to Climate Change and Energy Conservation

Naoko DOI, Senior Economist, Manager
Energy Efficiency Group
Climate Change and Energy Efficiency Unit

On January 28, a subsidiary of US oil company Occidental announced it will become the world's first supplier of carbon-neutral crude oil using carbon offset credits. However, to reduce CO₂ on a global level, it is necessary to capture the CO₂ in the atmosphere and store it. On January 27, the Taskforce on Scaling Voluntary Carbon Markets (TSVCM), which has led private-sector discussions, issued its final report indicating the importance of direct air capture (DAC) and absorption and sequestration credits, among other topics. On February 1, ExxonMobil announced the establishment of a subsidiary that will conduct CCS projects at more than 20 locations in six countries.

On February 19, the 30th meeting of the Energy Efficiency and Conservation Subcommittee was held to discuss specific problems with demand-side initiatives and countermeasures for them in response to the 2050 carbon neutrality policy.

First, in order to implement energy efficiency measures thoroughly, the present situation was confirmed. The progress toward the FY2030 energy efficiency target (50.3 million kl) under the envisioned energy mix was 13.4 million kl (progress rate: 27%) as of FY2018, below the reference progress rate of 33% that should have been achieved by the fiscal year. It is important to introduce heat pumps in industry, step up measures in the cement, steel, and chemicals sectors, improve the insulation performance and equipment efficiency of houses and other buildings, promote digitalization, introduce next-generation vehicles, and improve the efficiency of supply chains.

Second, the Subcommittee confirmed electrification and the shift to hydrogen energy as means to increase the use of non-fossil fuels on the demand side. Meanwhile, a member pointed out the need to amend the Act on the Rationalization of Energy Use to broaden the definition of energy conservation and include non-fossil fuels in its scope, since the Act currently focuses on rationalizing the use of fossil fuels. For instance, a reduction in fossil fuel consumption resulting from introducing non-fossil fuels is currently counted as an improvement in energy intensity. In some cases, this is causing manufacturers and others to increase the use of renewable energy to meet the goal of improving energy intensity by 1% per year stipulated in the Act. Instead, the introduction of renewable energy should be accelerated after revising the definition of energy conservation and implementing conservation measures to the utmost extent.

Third is the need for digitalization, optimization, and enhanced resilience. To level out electricity demand, the current Act calls for using electric appliances during off-peak hours and shifting to fuels and heat energy. As the share of renewables rises, it will be necessary to optimize demand using digital technologies such as by shifting demand to time slots with a high share of renewables. The moderator also mentioned the need to adopt self-regulating equipment to prepare for supply shortages under severe weather.

IEEJ Chairman and CEO Masakazu Toyoda commented as follows:

- Fundamental measures including raising the target levels must be considered for stepping up efforts not only toward 2050 but also toward 2030.
- The concept of the current Act on the Rationalization of Energy Use, which exclusively targets fossil fuels, should be revised. A stepwise approach should be taken, starting with conserving energy and then introducing renewable- and fossil-fuel based hydrogen, for example.
- It is important that SMEs in industry renew their facilities. Tax breaks such as corporate tax deductions should remain in place.
- In the residential and commercial sector, it is important to implement tax breaks to help ZEBs/ZEHS spread, alongside government procurement. Implementing mandatory energy efficiency inspections and providing financial support must be considered for existing buildings.
- The transport sector should pursue both EVs and FCVs. Japan must lead the formulation of regulations to strengthen its industrial competitiveness.



5. Update on Renewable Energies

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

The electricity crunch that hit Japan this winter was caused by a complex interaction of many factors. However, as was pointed out at the 9th IEEJ Global Energy Webinar “Consideration of the electricity crunch this winter” (by Ken Koyama and Junichi Ogasawara), the main reasons were the sharp rise in electricity demand caused by the cold weather and LNG procurement constraints. The freeze had been predicted following the La Nina phenomenon last summer, but it was not possible to pinpoint the timing. Meanwhile, the LNG procurement constraints were caused by rising demand in the international LNG market, supply troubles, and transport constraints. Some also consider that bad weather and snow accumulation caused solar PV output to fall from late December to early January, accelerating the decrease in LNG stocks. Short periods of no solar PV (of a few days, for example) can be dealt with by increasing thermal power generation, for which there are abundant stocks of fuel, but the prolonged unavailability of solar PV may have worsened the crunch.

The main problems associated with introducing large amounts of renewables are considered as follows: (1) closure of thermal power plants due to the loss of opportunities to generate power and consequent uncertainty of recouping investment, and (2) the possible disruption of necessary power supply in case renewable output drops amid closures of thermal plants. This has led to efforts to secure supply by establishing a capacity market. Meanwhile, the recent shortage highlighted the problem that thermal power could not be generated due to fuel purchase constraints (the shortage of “kilowatt hours”) even though there were enough kilowatts (plant capacity).

When solar PV becomes unavailable in large areas for extended periods due to climate conditions, it is necessary to generate thermal power and hence secure fuels. The same applies to wind power. According to the supply-demand data of general transmission and distribution companies, the percentages of solar PV in electricity demand for December 2020, the month before the shortage, were 4% for Hokkaido, 4% for Tohoku, 2% for Hokuriku, 7% for Chugoku, 4% for Kansai, and 10% for Kyushu. The percentage of wind power output was 0%–6%. It is not possible to carve out and determine the impact of natural VRE capacities in these regions since the problem had complex causes. However, similar incidents may occur in the future as more natural VRE capacities are introduced.

Rare but prolonged losses of natural VRE generation¹ like the aforementioned are called the doldrums, named after the belt of windless waters around the Earth near the equator, and “dark doldrums” when they involve a lack of solar radiation. To secure a stable energy supply to prepare for such “dark doldrums” whose timing and extent are difficult to predict, it is necessary to secure a sufficient surplus for overall supply capacity or a certain level of energy stocks. While fossil fuels are currently best suited for stockpiling, renewable energy stockpiling using batteries will become an option in aiming for carbon neutrality. However, renewable energy stockpiling using batteries has problems such as unsuitability for long-term storage due to the discharge loss and large space required. Hydrogen energy, which is free of these problems, and hydrogen-derived synthetic fuels, which are easier to store, may become new options for stockpiling in the future.

¹ See “US Watch” on page 8 of this Newsletter for the freeze-induced disruptions in wind and other power supplies in Texas in February.



Past IEEJ Events

Energy and Economy Indicators of Japan

IEEJ Homepage Top

Back Numbers of *IEEJ e-Newsletter*

Back Numbers of *IEEJ Newsletter* (Original Japanese Version - Members Only)



***IEEJ e-Newsletter* Editor: Yukari Yamashita, Managing Director**
***IEEJ j-Newsletter* Editor: Ken Koyama, Senior Managing Director**
The Institute of Energy Economics, Japan (IEEJ)
Inui Bldg. Kachidoki, 13-1 Kachidoki 1-chome, Chuo-ku, Tokyo 104-0054, Japan
Tel: +81-3-5547-0211 Fax: +81-3-5547-0223



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