

IEEJ e-NEWSLETTER

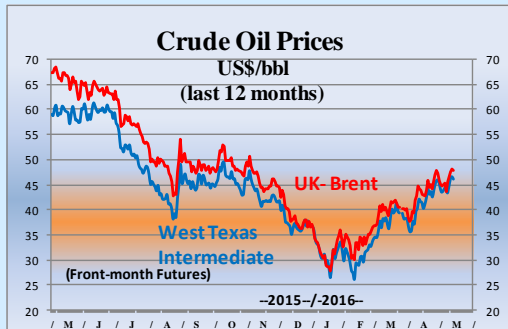
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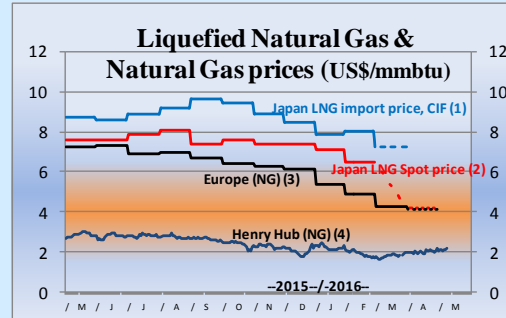
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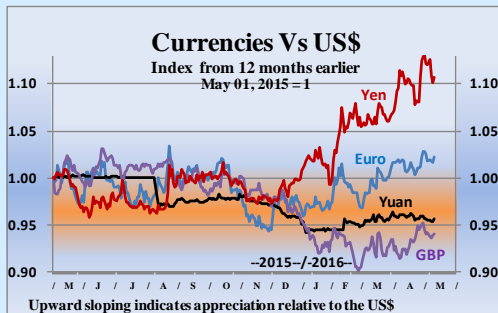


Source: DOE-EIA, Financial Times, NASDAQ

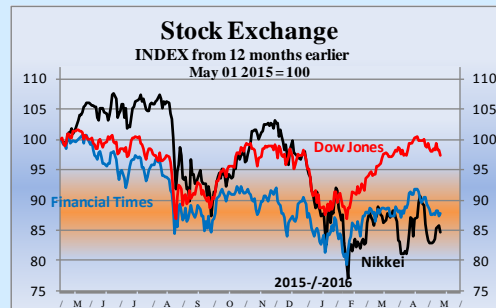


Sources:

- (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)



Source: x-rates.com



Source: Financial Times

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Summary

【Energy Market and Policy Trends】

1. Developments in Nuclear Power

The Amendment to the Convention on the Physical Protection of Nuclear Material that requires members to take tougher measures to prevent terrorism was approved, becoming effective on May 8. In Japan, permission was granted for improvements in the reactor installation of Kansai Electric's Takahama Units 1 and 2, opening up the possibility for the plants to operate beyond 40 years.

2. Recent Developments in the Oil Market

The Doha meeting failed to agree on freezing oil output. In future, the oil market will continue to be affected by complex factors like the global economy and demand trends, US shale production, and the next OPEC Conference.

3. Recent Developments in the LNG and Gas Markets

As investments in new LNG development projects slow, it is significant that the export of US shale-derived LNG has started. US LNG, whose benefits include not having a Destination Clause, must be closely monitored.

4. Update on Climate Policies

In Japan, all the measures for the 2030 targets, including the Energy and Environmental Innovation Strategy and the energy saving budget, are now in place. Going forward, steadily implementing these measures will be an important challenge.

5. Revised Hydrogen Roadmap: Start of Full Discussion on Hydrogen from Renewable Energy

The Strategic Road Map for Hydrogen and Fuel Cells has been revised, and full discussions on hydrogen from renewable energy will start this fiscal year. It is hoped that the discussions will evaluate both the advantages and disadvantages of using renewable-derived hydrogen.

1. Developments in Nuclear Power

Tomoko Murakami, Manager
Nuclear Energy Group, Strategy Research Unit

From March 31 to April 1, the Fourth Nuclear Security Summit was held in Washington D.C. The Summit was attended by some 40 leaders from 55 countries and three international organizations and an agreement was reached to act jointly against the risk of nuclear terrorism. In the US-Japan Joint Statement on Nuclear Security Cooperation with US President Barack Obama, Japan's Prime Minister Abe announced that the countries have completed the removal of all fuels from the Fast Critical Assembly (FCA) in Japan and have decided to remove all highly-enriched uranium fuel from the Kyoto University Critical Assembly (KUCA), a nuclear reactor of the Kyoto University Research Reactor Institute. The two countries plan to continue their activities in the Nuclear Security Working Group under the US-Japan Bilateral Commission on Civil Nuclear Cooperation, and to keep playing a leading role in global nuclear security.

About one week later, on April 8, the Amendment to the Convention on the Physical Protection of Nuclear Material was approved by 102 countries, two-thirds of its 152 signatory countries, which was put into effect on May 8. Director General Amano of the International Atomic Energy Agency (IAEA) emphasized the significance of this Convention in terms of preventing terrorism, citing the obligations on its signatories to protect their nuclear facilities and material from domestic terrorists and enhanced collaboration among the members in emergency situations. Whether the Convention will have teeth will depend on how the collaboration is actually executed, including information sharing, by each signatory.

Along with the awareness of nuclear security, there is increasing focus on long-term constant efforts to ensure the safety of nuclear facilities. On April 4, the European Commission released an estimate of nuclear-related investment that will be required by the EU. According to the estimate, the investment needed to match the plant capacity to meet the 2050 EU energy target (approx. 95 GW; 120 GW as of 2015) will be 650-760 billion euros in total for 2015-2050. This translates to a generation cost of 20-30 euro/MWh (2500-3700 yen/MWh), which is not negligible in view of the EU's present nuclear generation cost and which might be unaffordable for some member countries. The estimate is the European Commission's official indication of the nuclear power capacity that must be maintained and the cost needed to do so. The response of the nuclear policy-makers and operators of the member countries must be closely monitored.

On April 20, the Nuclear Regulation Authority granted permission for improvements in the reactor installation of Kansai Electric's Takahama Units 1 and 2. The plants are now expected to restart around 2019 following construction work to meet the new regulation standards, although they must first gain licenses for their construction plans and operation extension by July when they reach the end of their operation time limit. Meanwhile, as can be inferred from Shikoku Electric's decision on March 25 to decommission its Ikata Unit 1, the domestic nuclear business remains tough and unpredictable. Whatever actions the utilities decide to take for those reactors for which they have not yet applied for safety assessments, we should strictly keep from any speculations, understanding that they are strategic management decisions that the utilities make based on their own circumstances.

2. Recent Developments in the Oil Market

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

On April 17, 18 OPEC and non-OPEC oil producers gathered in Doha to discuss freezing oil output, but failed to reach an agreement. Since the start of April, WTI and Brent prices have been around \$40/barrel, anticipating robust growth in demand and some form of agreement at the Doha meeting, but the hopes were dashed.

The main cause of the meeting's failure is undoubtedly the confrontation between Saudi Arabia and Iran. Having agreed with Russia, Qatar, and Venezuela in February to freeze oil output, Saudi Arabia had stressed prior to the April 17 meeting that all OPEC producers including Iran should agree on the freeze. However, Iran objected as it had been forced to cut back production due to the economic sanctions, and thus the announcement was made on April 16 without the presence of Iran's Petroleum Minister Bijan Zangeneh. Others report that Saudi Arabia refused to let Iran participate unless it agreed on the freeze. In the end, Saudi Arabia's decision not to agree to the freeze without Iran was likely the main reason for the failure of the meeting, in which all member countries put their market shares first.

Despite fears that oil prices would tumble if the meeting failed, so far the fall has been limited. Both WTI and Brent slipped on the following day, the 18th, but by less than \$1/barrel. On the contrary, prices climbed from the 17th to the 20th due to the oil workers' strike in Kuwait, hitting the year's peak of \$44-45/barrel on the 21st. Other possible factors behind the rise include robust demand and financial factors. In the US, the faster-than-expected decrease in product inventory is propping up prices, and China's gasoline demand is also robust. The price increase may also be due to the downward pressure on the dollar due to expectations of slower interest rate hikes in the US, now that the financial market turmoil of January and February has receded.

However, prices may not continue to climb. The collapse of the Doha meeting highlighted the fact that the enmity between the oil producers is so intense that they cannot agree on a freeze even at the current high level of production. The US EIA estimates that the US will produce 0.8 million barrels/day less in 2016, at 8.6 million barrels/day, but the decrease is likely be offset by Iran's production increase for the same year. On April 12, the IMF lowered its forecast for GDP growth from 3.4% to 3.2% in January, and estimated that global oil demand in 2016 would grow by 1.2%, lower than in 2015. Although the turmoil in financial markets at the beginning of the year has subsided, choppy waters may be ahead.

The key points for the summer are the trend in gasoline demand, the financial situation of US shale oil producers, and the OPEC Conference on June 2. It is not clear how these short-term factors will interact with medium-term factors such as the slumping investment in oil fields and the resulting production cuts, and how and when instability in financial markets and the slow economy will affect demand and prices.

3. Recent Developments in the LNG and Gas Markets

Yoshikazu Kobayashi, Senior Economist, Manager
Gas Group Fossil Fuels & Electric Power Industry Unit

International LNG prices remain low. As of mid-April as this report is being written, the spot price of LNG for northeast Asia is barely above \$4/MMBtu. Spot prices did not rise even when production was disrupted at Australia's just-launched Gorgon LNG due to a cooling unit trouble, highlighting the depth of the current supply glut.

Given the recent supply-demand and price situation, final investment decisions on a series of new LNG investment projects were postponed or revised. In February, Shell announced that it was postponing the final investment decision on LNG Canada on the country's west coast, and in March, Australia's Woodside decided to suspend the Browse Project, which had a planned annual output of 12 million, on account of the current economic environment.

On the demand side, the global demand for natural gas remains weak. Despite talk of entering a "golden age", natural gas has lost momentum except in the US and a few other exceptions due to tougher competition with price-competitive coal and renewable energy with generous government support. Japanese buyers are having to be careful when signing the long-term contracts necessary to launch new projects, as future demand is becoming increasingly uncertain in view of regulatory reform and the restarting of nuclear power plants. As the global LNG market comes to realize that the supply glut may persist until around 2020, an increasing number of projects could be subject to postponement or revision of their final investment decisions.

Meanwhile, the US started to export shale-derived LNG, which is good news for the supply side. Cheniere's Sabine Pass liquefaction plant that shipped its first cargo to Brazil in February is continuing to do well, shipping cargo to South America and India. Among the LNG project plans worldwide, American LNG, which requires relatively low investment, could add 62 million tonnes/year of new capacity by 2020, although not all new projects are likely to be launched as planned.

The price of American LNG is Henry Hub-linked, and is not necessarily more competitive than oil-linked LNG under the current low oil prices. However, it could become more competitive than oil-linked LNG as oil prices rise in future. The benefits of American LNG on the Asian LNG market could include the diversification of supply sources and price indexes, but the greatest feature is the availability of large volumes of LNG without the destination clause, which will improve trade liquidity. For the establishment of a healthy LNG market in Asia, close attention must be paid to the position and use of American LNG.

4. Update on Climate Policies

Takahiko Tagami, Senior Coordinator, Manager
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Global Environment and Sustainable Development Unit

On March 17, the National People's Congress (NPC) of China released the "Thirteenth Five-Year Plan on National Economic and Social Development". Regarding the reduction of GHG emissions, the Plan refers to establishing a national CO₂ emissions trading market and launching a system for the reporting, auditing, verifying of emissions, and allowance management for key companies.

Meanwhile, in Japan, the Working Group for Formulating Energy and Environmental Innovation Strategy of the Cabinet Office's Council for Science, Technology and Innovation (CSTI) finalized the Energy and Environmental Innovation Strategy on March 24. Seven innovative technology areas for intensive research and development were identified: innovative production processes (membrane separation and catalyst utilization without a high-temperature, high-pressure process); ultra-light, heat-resistant structural materials; next-generation battery cells; production, storage, and utilization of hydrogen; next-generation solar PV; next-generation geothermal power; and carbon capture, utilization and storage. The technological challenges of each area were summarized.

According to the Secretariat of the United Nations Framework Convention on Climate Change, over 30 billion tonnes of additional CO₂ reduction will be required by 2050 to achieve the scenario compatible with the 2°C target; the areas identified by this Strategy could reduce CO₂ by more than 5 billion tonnes in total. Regarding the system for promoting R&D, the Strategy proposes making a long-term commitment by the government to share the R&D vision with industry, in view of the recent shift of corporate R&D investment to short-term projects, and leading international efforts through the Innovation for Cool Earth Forum (ICEF) and other bodies while clarifying where to cooperate and to compete.

On March 29, the budget for FY 2016 was approved. For the Ministry of Economy, Trade and Industry (METI), the budget for energy conservation was raised to 96 billion yen from 78.6 billion yen in FY 2015. Further, an additional 54.2 billion yen has been provided as supplementary budget for FY 2015. The breakdown consists of 61.3 billion yen for industry (plus 44.2 billion as the supplementary budget), and 33.6 billion yen for the transport and residential/commercial sectors (plus 10 billion as the supplementary budget). Beyond 2016, "the Energy Innovation Strategy" was formulated by the METI on April 18 to achieve the Energy Mix and boost energy investments by addressing "thorough energy conservation", "expansion of renewable energies", and "establishing a new energy system".

With the finalization of the Energy and Environmental Innovation Strategy and the approval of energy conservation budget, all the measures for the 2030 targets have now been published, with the others being the climate policy framework for the power industry for 2030 agreed in February and the global warming countermeasures plan due for Cabinet approval in early May. On April 22, the Paris Agreement signing ceremony was held. Going forward, steadily implementing these measures and actually achieving the targets will be important challenges.

5. Revised Hydrogen Roadmap: Start of Full Discussion on Hydrogen from Renewable Energy

Yoshiaki Shibata, Senior Economist

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In December 2013, the Ministry of Economy, Trade and Industry established the Council for a Strategy for Hydrogen and Fuel Cells, which compiled the Strategic Road Map for Hydrogen and Fuel Cells in June 2014. Recently, on March 22, a revised version of the Road Map was released. This rather early revision of the road map, just two years after it was drawn up, is because issues have emerged concerning hydrogen and fuel cell technology amid its expansion.

As of the end of January 2016, more than 150,000 residential fuel cell units have been installed, up from less than 40,000 in FY 2012. However, lower prices are required to achieve the goal of 5.3 million units by 2030, and thus a numerical target was set to lower the initial cost. The initial cost has already come down to 1.4 million yen (PEFC type) from 3 million yen in 2009 when fuel cells were first marketed. However, the price will be lowered further, aiming at 0.8 million yen by 2019, to match the economy of competing products.

Fuel cell vehicles had sold only 400 units by the end of 2015 since their commercial launch in December 2014. The initial road map did not set a numerical target, which raised concerns that auto makers and hydrogen station constructors might hesitate to invest. The revised road map targets ownership of 0.8 million units by 2030, which would be just over 1% of all vehicles currently owned. Further, regarding hydrogen stations, only 70 stations have opened despite the target of 100 stations by 2015, and a numerical target of 320 stations by 2025 was set to keep pace with the increase of fuel cell vehicles.

These numerical targets are anticipated to boost the spread of fuel cells, but for the time being, the hydrogen that feeds the cells will be produced by passing natural gas and other fossil fuels through a reformer unit, or by reforming domestic byproduct hydrogen and fossil fuels and feeding the generated hydrogen directly into the cells. Both of these processes emit CO₂ and prevent fuel cells from substantially reducing CO₂, which is one of the benefits of using hydrogen. Thus, the initial road map considered, as the primary means to achieve CO₂-free hydrogen, importing hydrogen produced overseas from fossil fuels using CCS. Meanwhile, efforts to produce hydrogen from renewables are increasing mainly in Germany.

The revised road map clearly states that studies will start this fiscal year on renewable-derived hydrogen as a means to achieve CO₂-free hydrogen. Producing hydrogen from renewables had also been considered in the Sunshine Project and the New Sunshine Project of the 1970s to 1990s, but the problem of high cost remains. Meanwhile, the technology has benefits such as drastically cutting CO₂ and sharply reducing fossil fuel imports by using domestic renewable energy. Other possible benefits include grid integration measure for variable renewables, promoting local production for local consumption through the effective use of local renewable resources, and revitalizing related local industries. Going forward, the Council for a Strategy for Hydrogen and Fuel Cells is expected to discuss the latest domestic and overseas trends and technological developments, and evaluate both the advantages and disadvantages of using hydrogen from renewable energy.

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