

# IEEJ e-NEWSLETTER

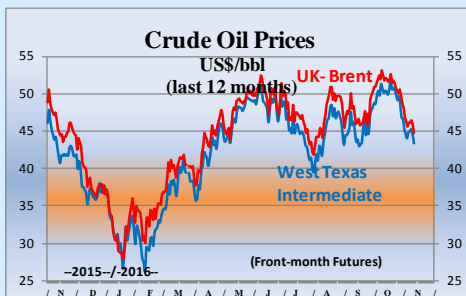
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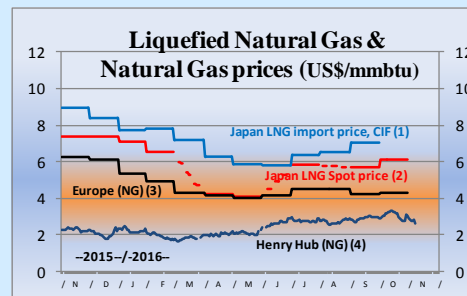
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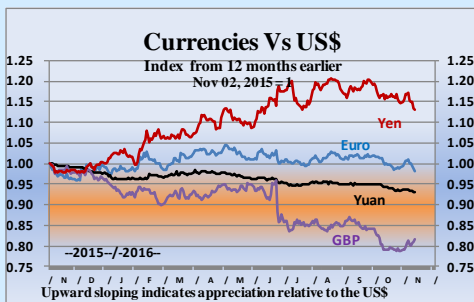
(As of November 11, 2016)



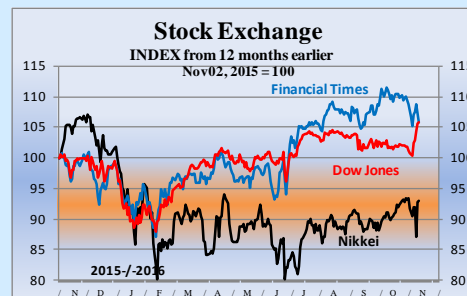
Source: DOE-EIA, Financial Times, NASDAQ



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. Asia/World Energy Outlook 2016**

The Outlook 2016 features a detailed analysis focusing on ASEAN. The impact of supply disruption, ultra-long-term climate actions, hydrogen with CCS, and the nuclear scenario were also analyzed.

#### **2. Developments in the Electricity Market**

Various councils have been established since September and will discuss how to promote competition while addressing challenges in order to benefit the public, and the growth strategies for electricity and gas businesses. The business environment may change drastically for newcomers.

#### **3. Recent Developments in the Oil and LNG Markets**

The surprise agreement on September 28 to cut production and the "verbal interventions" by the leaders of oil-producing countries sent oil prices rising, but this may not last long considering the supply-demand fundamentals.

#### **4. Update on Climate Policies**

The Paris Agreement came into effect, and an agreement was reached on reducing emissions with regard to international aviation and refrigerants. The third conference of ICEF was held, and studies on carbon pricing began in the Task Force for the Expansion of Domestic Investment.

#### **5. Japan's Shrinking Solar Power Module Market**

With the downward revisions of the FIT purchase price, the Japanese panel market is shrinking unstoppably. The decline in smaller projects is hurting the domestic share of Japanese companies, which are increasingly reaching out overseas for survival.

## 1. Asia/World Energy Outlook 2016

**Shigeru Suehiro**

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

The Reference Scenario, which serves as the basis for the Asia/World Energy Outlook 2016, projects that global primary energy demand will grow by 1.4 times between 2014 and 2040. Natural gas will surpass coal to become the second most important fuel, driven by its use in the generation sector. Renewable and nuclear capacities will increase, but fossil fuels will remain by far the most important fuel with a share of 78%.

### **Overview of the ASEAN energy market**

At the end of last year, ASEAN, which celebrates its 50th anniversary in 2017, established an economic community, raising hopes for its further development through trade liberalization and market unification. ASEAN's energy demand will almost double by 2040, and the Association's dependence on cheap coal will rise mainly in the generation sector. The energy self-sufficiency rate will fall below 100% by 2030 as domestic production fails to keep up with the additional energy demand. Requiring over 2 trillion dollars of energy investment by 2040, deregulation, as well as transparency and stability of policy, will be essential for ASEAN. Further, energy cooperation will contribute significantly to the 3Es of energy: energy security, economic efficiency, and environment. With the lack of funds and technical strength hindering the development of the energy market, there are high hopes for Japan.

### **Dealing with energy security and climate change issues**

A large-scale physical shortage of oil and gas would profoundly affect the global economy (a 10 million barrel/day shortage would cause a 9% drop in the global economy). This would severely affect Asia, which relies heavily on imports. It is important continuously to implement measures such as supply diversification, energy storage and conservation, and energy substitution.

Under the Intended Nationally Determined Contributions of the Paris Agreement, GHG emissions will increase to 46 billion tonnes in 2030, greatly deviating from the path to halve CO<sub>2</sub> emissions by 2050. In view of ultra-long-term sustainability, it would be worth assessing which combination of the three cost components, namely mitigation cost, adaptation cost, and damage, would minimize the total cost. Under such a model, emissions will roughly halve from current levels just after 2150, and the total cost will be significantly lower than the "halving by 2050" path. As the climate change issue involves great uncertainty, it is important to develop technologies with a long-term perspective, such as hydrogen which is a promising option. Global CO<sub>2</sub> emissions can be significantly reduced by producing hydrogen with CCS in oil- and coal-producing countries and trading the product internationally.

**Determining the significance of nuclear energy**

The future prospects for nuclear power are highly uncertain, affected by both the domestic situations of countries and the international situation. If the cost advantage of nuclear power is maintained and if the technology is transferred smoothly from advanced countries to emerging countries, then the "high nuclear power scenario", which positions nuclear power as the base source of electricity, could work. Under this scenario, Asia's installed nuclear capacity would grow seven-fold from current levels by 2040, and CO<sub>2</sub> emissions, self-sufficiency rate, and economic efficiency could all improve significantly. However, it will be necessary to strengthen the safety regulation standards and improve the regulatory systems in line with the growth of the nuclear industry. To enable nuclear power to play an important role in achieving the 3Es for the world and Asia, great efforts must be made while constantly ensuring safety.

## 2. Developments in the Electricity Market

**Junichi Ogasawara**, Senior Economist, Manager  
Electric Power Group

Electric Power Industry & Smart Community Research Subunit  
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On September 27, a policy subcommittee to complete the reforms of the electric power system was established under METI's Strategic Policy Committee, Advisory Committee for Natural Resources and Energy. The subcommittee began discussions to formulate policies to achieve public benefit goals including reducing CO<sub>2</sub> while promoting competition, adjusting thermal power capacities necessary for expanding renewable energies, and measures for investing effectively in power transmission. Further, a working group for market development was established under the subcommittee on October 7 to conduct studies on establishing a base load power source market that provides PPSs with better access to nuclear and coal-fired thermal power, and a credit market for non-fossil power sources and a capacity market to help achieve the target percentage for non-fossil power sources of 44% in 2030 required under the Act on Sophisticated Methods of Energy Supply Structures. Further, to address the increasing uncertainty in recouping nuclear backend costs due to the government's policy of intensifying competition, a financial and accounting working group was established on October 5 to review the cost burden through leased transmission fees.

Meanwhile, the Basic Policy Subcommittee on Electricity under the Electricity and Gas Industry Committee was reorganized as the Basic Policy Subcommittee on Electricity and Gas to deal with gas business issues together with electricity issues as of October 18. The Subcommittee will discuss the future growth strategy for both electricity and gas against a backdrop of declining domestic energy demand. The topics for discussion will include globalization and digitization. Ideas are being sought on which areas will help Japan become more competitive and gain access to overseas markets.

The Organization for Cross-regional Coordination of Transmission Operators, Japan has also set up various committees to study and review the use of adjustment capacities and connection lines. The latter is particularly noteworthy as the discussions aim to establish a completely new approach to using the connection lines, in which day-ahead market transactions of the Japan Electric Power eXchange are adopted while hedging risk by introducing the Financial Transmission Right (the right to receive transmission congestion revenue).

As described above, several extremely important issues for the electricity business are due to be discussed concurrently. The discussions must take note of the mutual workings and implications among the new and changed systems. In particular, the electricity retailers who entered the retail sector at the launch of full retail liberalization in 2016 and the electricity producers who are considering building a new thermal power plant should note that the direction of the reforms is likely to drastically alter the business environment which companies have been anticipating and force them to review their investment plans.

In the area of nuclear power, recent notable moves include the victory of Governor Yoneyama, who, like his predecessor, is wary of restarting the nuclear power plants, in the Niigata gubernatorial election, the finalization of the report on the accordance with the new regulation standards necessary to operate Kansai Electric's Mihama Unit 3 beyond 40 years, and the first meeting of the Council on Fast Reactor Development chaired by METI Minister Seko which reconfirmed the significance of fast reactor development.

### 3. Recent Developments in the Oil and LNG Markets

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

After OPEC unexpectedly agreed on September 28 to cut production, efforts toward a joint production cut have accelerated among the oil-producing countries including non-OPEC producers in October. The oil ministers of OPEC and non-OPEC states reportedly held an unofficial meeting in time for the World Energy Congress held in Istanbul from October 9 to 13 to discuss how to implement the planned production cut. On October 10, Russian President Vladimir Putin announced that the country is willing to join the OPEC countries' agreement to cut production. It is understood that OPEC, out of frustration with low oil prices and the delay in supply-demand rebalancing, has now somewhat changed policy of maintaining its market share which it had held firmly for almost two years. While Saudi Energy Minister Khalid al-Falih's advice against an excessive supply reduction, oil prices climbed after OPEC agreed, buoyed by a succession of comments by the leaders of oil-producing countries supporting the production cut, with the Brent price reaching \$53/barrel in mid-October.

Although oil prices rose as a result of the surprise agreement and "verbal intervention" by the oil producer leaders, this rise may not last. No individual quotas have been set for the member states yet, and even if the members agree on a quota at the OPEC meeting on November 30, they may not necessarily observe it. Moreover, the supply-demand fundamentals are weaker than previously assumed. The market now widely expects that the rebalancing will be delayed more than previously expected, as US production is bottoming out and Nigeria and Libya are likely to increase production as the domestic security situation improves. Some also remain pessimistic about the prospects for the global economy, and the US interest rate increase will occur eventually. To prop up prices under such circumstances, greater cuts need to be agreed on and executed, but this will not be easy. Even if the oil producers manage to achieve this, the resulting rise in oil prices could cause US production to bottom out earlier.

Meanwhile, the LNG market has not even begun to show signs of rebalancing. Despite a historic supply glut, the liquefaction capacity of LNG will increase by yet another 50% (approx. 130 million tonnes/year) by 2020. Demand growth is accelerating in China, India and some liquefaction plants have troubles and delays in starting operation. Overall, however, supply remains excessive, with the LNG price for Asia remaining stable at \$6-7/MMBtu. The introduction of LNG is accelerating in many countries due to the current market situation and the increase in floating LNG terminals which have a shorter construction lead-time. In addition, the liquidity of the LNG market is improving as a result of the enormous increase in supply, particularly that of LNG exports without a destination clause such as American LNG. For sustainable development of the LNG industry, producer and consumer countries must work together to make LNG more cost-competitive and develop new demand for it.

#### 4. Update on Climate Policies

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

There were three major global events in October concerning climate change. First, on October 5, with the ratification by the EU and some of its member states, the combined GHG emissions of the countries that have ratified the Paris Agreement surpassed 55% of the world total, and thus the Agreement took effect on November 4.

Second, on October 6, the Assembly of the International Civil Aviation Organization (ICAO) held in Montreal agreed a global market-based measure scheme to control CO<sub>2</sub> emissions from international aviation. This scheme will be implemented in the form of the Carbon offsetting and Reduction Scheme for International Aviation that requires airline operators to offset any increase in CO<sub>2</sub> emissions from 2020 levels by using emissions units, including credits issued by the mechanisms established under the UNFCCC and the Paris Agreement.

Third, on October 15, the Meeting of the Parties to the Montreal Protocol held in Kigali, Rwanda agreed on a phase down of hydrofluorocarbons (HFCs). The Montreal Protocol on Substances that Deplete the Ozone Layer was amended to include HFCs, though HFCs themselves are not ozone-depleting substances, but they are used as refrigerants to replace such substances and their global warming potentials are significantly higher than that of CO<sub>2</sub>. These three issues had remained pending for a long time despite negotiations, and thus October 2016 was a landmark month.

On October 5 and 6, the third annual conference of the ICEF (Innovation for Cool Earth Forum) was held in Tokyo. The ICEF was established under Japan's initiative for experts from the world's industry, government, and academia to discuss innovations for climate action. The meeting discussed 16 topics including nuclear power, CO<sub>2</sub> utilization, nuclear fusion, hydrogen energy, and space solar satellite in concurrent sessions. The ICEF Steering Committee commented in a statement that "we must adopt as a goal to achieve at least NET ZERO ANTHROPOGENIC CO<sub>2</sub> EMISSIONS in the long run in order to stabilize global temperature levels." The Steering Committee also commented that "we should pursue this goal together with other Sustainable Development Goals (decided at the UN Sustainable Development Summit 2015)." Further, two draft technology roadmaps on CO<sub>2</sub> utilization and ZEB (zero energy buildings) were presented.

In Japan, METI's Task Force for the Expansion of Domestic Investment and the Environment Ministry's Long-Term Low Carbon Vision Subcommittee continued to be held. The Task Force started on hearing the views of finance/investment and carbon pricing experts, and the IEEJ pointed out the challenges of the world's major emissions trading systems, such as the difficulty of setting appropriate emissions caps, and the significant impact of economic fluctuations on emissions. The Long-Term Low Carbon Vision Subcommittee continues to conduct expert hearings on long-term goals, the residential sector, and innovation.



## 5. Japan's Shrinking PV Module Market

**Hisashi Hoshi**

Board Member, Director  
Charge of New and Renewable Energy  
& International Cooperation Unit

### Japan's Shrinking Solar Power Module Market

The introduction of new solar PV capacity has begun to slow in Japan. According to METI's announcement on October 14, new solar PV capacity for June was just 410 MW. This is the second-lowest figure ever recorded, behind only the figure in May of 400 MW, and is roughly half the level of the monthly average of 700-800 MW for FY 2015 (annual total of approx. 9,160 MW).

Shipments of PV modules are also sluggish, with domestic shipments falling 21% year-on-year for April-June and 23% (preliminary) for July-September according to the Japan Photovoltaic Energy Association. This drop in shipments, including imports, is occurring mostly in Japanese companies. Further, the decline is occurring only for residential and general business purpose modules; there is no major change in modules for generation business, including mega solar. In contrast, exports are soaring at 152% year-on-year.

Behind this trend is the slowdown of smaller projects such as rooftops. Already on the decline reflecting the downward revision of the FIT purchase price, shipments for smaller projects have dropped further since the latest price revision this April. Since Japanese brands were strong in smaller projects, the share of Japanese companies has dropped from around 70% to 58%. The sharp increase in exports reflects Japanese companies' efforts to make up for the drop in domestic sales and keep their factories running.

Because of the tough domestic market, Japanese companies are looking overseas. Last month, Panasonic announced that they are considering joint panel production with Tesla in New York State. Solar Frontier has already begun to develop power plants in the US, and was reported in September to be considering building a factory in Saudi Arabia. Meanwhile, Sharp is said to be considering entering the Chinese market under Hon Hai. With the downward revision of the FIT purchase price, the Japanese market has ceased to be the incubator of the solar panel industry. Japanese panel makers continue to reach out overseas for survival.

### German-Japanese Energy Transition Council

In April this year, the IEEJ established a council for discussing the long-term energy strategy of Japan and Germany jointly with Germany's Wuppertal Institute. The Council held its first meeting at the end of September at the IEEJ. The Council, consisting of ten experts from each country, identifies the challenges in the long-term energy strategy of the two countries, leads commissioned studies on each theme, and ultimately submits policy proposals based on the results.

The meeting studied the appropriateness of the following five areas, as well as the specifications for the commissioned study on each: (1) Analysis of the scenarios for the long-term energy policies, (2) analysis of the social and cultural backgrounds that facilitate energy innovation, (3) the roles of market players and their changes, (4) the potential of energy conservation policy and business, and (5) the role of technology. Further, 15 members from business groups of both countries joined the meeting, and offered valuable insights from a business perspective.

The results of the commissioned studies will be finalized in September next year and compiled into a report in winter.

**Past IEEJ Events**

**Energy Indicators of Japan**

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