

# ***IEEJ e-NEWSLETTER***

*No. 26*

(Based on Japanese No. 122)

Published: November 25, 2013

**The Institute of Energy Economics, Japan**

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## Summary

### **【Energy Market and Policy Trends 】**

#### **1. Report on the Oxford Energy Seminar**

On September 16 to 26, the 35th Oxford Energy Seminar was held. Lectures and discussions were held on various themes, not only energy but also the global economy, climate change, and the situation in major countries.

#### **2. Improving Maintenance Technologies is the Key to Expanding Wind Power**

Recently, there have been a series of major accidents at wind power plants in Japan. Maintenance is important for preventing accidents and failures and hence making the wind power business profitable. Japan should upgrade its maintenance technologies in step with the increase in wind power.

### **【Global Watch 】**

#### **3. China Watching: Shale Gas Development Moving toward Commercialization**

China is pushing ahead with developing its vast shale gas reserves. The state-owned CNPC and SINOPEC have set their shale gas output target, which they had once lowered, back to 4.5 billion m<sup>3</sup>.

#### **4. Russia Watching: Tax Benefits for Development of the Continental Shelf and Tight Oil**

Russia is going to offer tax benefits for the development of the continental shelf and tight oil, while taxes on existing oil wells will be raised. The impact of the tax reforms on oil and gas production and on investment by foreign funds must be closely monitored.

#### **5. EU Watching: Energy Infrastructure Projects of the European Commission**

To boost the construction of energy infrastructure such as electricity and gas grids, which the market alone cannot handle, the Projects of Common Interest of the European Commission is gathering attention.

## 1. Report on the Oxford Energy Seminar

**Tetsuo Morikawa**, Manager  
Gas Group, Fossil Fuels & Electric Power Industry Unit

From September 16 to 26, the Oxford Institute for Energy Studies of the UK held the 35th Oxford Energy Seminar, attended by approximately 60 personnel from oil and gas companies, engineering firms and financial institutions from approximately 20 countries. The top management of global energy firms and prominent energy experts gave lectures and discussions were held on various themes, not only energy but also the global economy, climate change, and the situation in major energy importing and exporting countries. The following is a summary of the major discussion points.

First, the impact of the shale gas revolution seems more significant than expected, and companies and experts are still trying to assess it. Particularly dramatic was the contrast between a speaker from the US, the winner of the Revolution, who emphasized energy independence and the revival of the American manufacturing industry, and a speaker from Russia, which has so far been negatively affected, who frankly admitted that Russia is facing difficulties such as domestic conflict over tax reforms and the export of natural gas.

The second point is the relationship between climate change policy and the difficulties faced by the traditional gas importers in Europe. With the latest combined cycle gas power plants shutting down and the share of coal-fired generation rising, the current situation was described as an example of failure of Europe's climate change policy. Furthermore, one European company revealed in a lecture that the traditional gas importers are suffering from the negative margin caused by the difference between the oil-linked price and the hub prices, and that the situation is worsening as the demand for natural gas itself is falling.

Third, it was notable that the importance of cooperation between the major international oil companies (IOC) and national oil and gas companies (NOC) was mentioned, especially by speakers from IOCs. However, the discussion of the participants criticized regulatory regimes in producing countries, especially in terms of the Local Content policy resulting in corruptions.

Throughout the seminar, the interest in Japan focused on the Fukushima accident and the Asia premium of LNG. While the participants were reasonably aware of the seriousness, complexity and impacts of the Fukushima disaster, they seemed less informed about the causes of the premium and Japan's efforts to address it. This might have been due to the limited number of LNG-related participants in the seminar, but it is also necessary to step up public relations activities regarding this issue.

## 2. Improving Maintenance Technologies is the Key to Expanding Wind Power

**Hisashi Hoshi**, Board Member, Director  
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There have been a series of major accidents at wind power plants in Japan since the beginning of the year. In March, in Kyoto prefecture, gusts measuring 20 m/s caused a 50-meter diameter blade unit to fall from a 46-meter tower together with the nacelle (the heart of a wind turbine containing a generator and a gearbox) weighing 38 tonnes. In April, a blade unit also fell off with the nacelle in Mie prefecture. Then in September, a blade unit fell with the rotor hub (which connects the blades with the rotor shaft) in Hokkaido. All three incidents were classified as serious accidents by the Ministry of Economy, Trade and Industry.

For wind power, whose cost consists mostly of the initial investment and involves very little additional cost for operation, the reduced rate of operation due to troubles is the greatest business risk. Any such loss, not to mention major accidents like the ones above, directly affects earnings. Furthermore, major accidents negatively affect the promotion of wind power itself. Maintenance to prevent accidents and keep the wind turbines running is crucial.

The maintenance of wind power, which involves checking and repairing wind turbines one by one on the tops of tall towers scattered over a vast area of land, is much harder than solar power. Furthermore, wind turbines are often located far from load centres to take advantage of good winds, which is why most projects are located in Hokkaido and Tohoku. It has always been known that setting up wind turbines in remote locations raises the cost of building and extending transmission lines. But this also applies to maintenance: remote locations make it more expensive to secure manpower, purchase components and deliver repair equipment.

Offshore wind power is an even greater challenge. The strong and constant winds offshore inevitably mean that oceanographic conditions are tougher out there; it is not easy to achieve efficiency while ensuring the safety of personnel accessing to and working on the tops of high towers above the heaving waves. In Europe, the maintenance cost accounts for a quarter of the overall cost of offshore wind power.

Japan is embarking on the full-scale development and deployment of offshore wind power. So far, its wind power projects have been small and located close to shore, but in June last year, Ibaraki prefecture announced a plan to build a large offshore wind farm (240 MW) off Kashima Port. The prefecture wishes to start construction in 2015 and be generating electricity by 2017. Furthermore, METI and NEDO have plans to run four demonstration projects, two based on the seabed and two floating, off the coast of Fukushima prefecture and Kita-Kyushu city. METI is planning to bolster offshore wind power, which is more expensive than land-based wind power, institutionally by raising its full amount purchase price to 1.5 to 2 times the current level starting next year, according to the Nikkei newspaper.

With its turbulent flows due to complex terrain and susceptibility to typhoons, Japan is a tough environment for wind turbines. However, it is necessary to overcome this challenge, improve the rate of operation, and extend the lifecycle of plants through appropriate monitoring and maintenance. Successful projects will significantly boost wind power generation and improve its profitability, so technological progress is keenly awaited.

### 3. China Watching: Shale Gas Development Moving toward Commercialization

Li Zhidong, Visiting Researcher  
Professor at Nagaoka University of Technology

The shale gas development in China is attracting worldwide attention. With its vast reserves of technically recoverable resources (estimated at 25 trillion m<sup>3</sup> in 2012 by China's Ministry of Land and Resources, 36 trillion m<sup>3</sup> in 2011 and 32 trillion m<sup>3</sup> in 2013 by the US EIA), China's successful development of shale gas, like that of the US, could greatly affect the global energy map as well as politics, the economy, diplomacy and global warming prevention.

In 2012, the government formulated the "Shale Gas Development Plan (2011-2015)", and set a target to produce 6.5 billion m<sup>3</sup> in 2015 and 60-100 billion m<sup>3</sup> in 2020. However, the output in 2012 was only 25 million m<sup>3</sup>. Although the Ministry of Land and Resources estimates that more than 40,000 boreholes must be drilled by 2020, only 100 had been drilled as of September this year. While non-state-owned oil companies such as those from other sectors and affiliates of regional governments bought drilling sites in 2012, they have not yet reached full-scale development. Furthermore, concerns such as securing sufficient water for development, preventing contamination, and whether pipelines can be built have not yet been resolved. This has discouraged risk-taking and led to pessimism both inside and outside the country since the beginning of the year.

However, signs of progress in development are slowly starting to appear. The major state-owned oil company SINOPEC drilled production wells in the Fuling drilling site in Chongqing, on September 25 and October 8, with a capacity of 380,000 and 550,000 m<sup>3</sup>/day, respectively, and total output from the site reached 1.40 million m<sup>3</sup>/day at the beginning of November. In 2014, the company is planning to drill 50 to 70 new production wells on the site and start commercial production. Another major state-owned oil company, CNPC, which is hesitant about development despite having promising drilling sites, has started to make a move. With the commercial development of the Changning site in Sichuan province ready to start, the company began to build a 92.8-km pipeline in June with an annual capacity of 1.5 billion m<sup>3</sup>. According to a report by the China Energy Network on October 16, both companies recently set total shale gas output targets, which they had once revised downward to 1.5 billion m<sup>3</sup>, back to 4.5 billion m<sup>3</sup>.

Reportedly, exploration and development costs have been massively reduced. According to a SINOPEC executive, for the Chongqing Fuling drilling site, the construction cost has already dropped from 30 million yuan to 20 million yuan (1 yuan = 16 yen) for an exploration well, and from 80–100 million yuan to 48 million yuan for a production well. Construction costs are expected to drop further to 15 million yuan for an exploration well and 30 million yuan for a production well as production expands and technology advances.

In October, the National Development and Reform Commission decided to accelerate the development of the Chongqing Fuling site and boost the supply of non-conventional natural gas as part of the effort to stabilize natural gas supplies this heating season. The Ministry of Land and Resources commented that China can realize the target in 2015 and the output may even amount to 10 billion m<sup>3</sup>, at the Unconventional Oil and Gas Partnership Summit 2013 held on November 15 in Beijing. Perseverance prevails. China has worked persistently on the commercial development of shale gas. We need to closely monitor the developments in the future, but there is no need for pessimism.

#### 4. Russia Watching: Tax Benefits for Development of the Continental Shelf and Tight Oil

Sanae Kurita, Senior Researcher  
Global Energy Group 2, Strategy Research Unit

Russia is making a series of legal changes to promote the development of new oil and gas fields. On September 30, President Putin signed a presidential order that gives tax benefits to oil and gas development projects on the Russian continental shelf. The revision will go into effect in 2014, and will provide incentives in terms of value-added tax (VAT), commodity tax, transport duty, and export duty for the oil and gas production and investment projects in the inland seas and oceans in Russian territory, the Russian continental shelf and the Caspian Sea of Russian territory, in order to spur their development.

On the same day, Putin also signed an order that provides incentives in terms of mineral resource exploration tax, crude oil export duty, and tax on profits for the development and investment projects in the drilling sites on the Russian continental shelf and Western Siberia that are difficult to explore. The order went into effect immediately. For natural gas and condensate, taxes will be adjusted by using a formula that takes into account exploration technology, the depth and the geological and geographical structure of the drilling site, and the price trend of international and domestic markets. Furthermore, for oil companies, the crude oil export duty and tax on profits will be lowered. Through these measures, the Bazhenov layer in West Siberia, with tight oil potential, will be exempted from production-related taxes, and the taxes on other shale oil and tight oil fields will be cut by 20 to 80%. This could be a strategic decision to expand development and production in frontier regions and territories, which have abundant resources that are difficult to develop, by offering tax breaks.

However, while tax breaks for new upstream development projects such as the above gather attention, a decision has also been made to lower crude oil export duties and gradually increase the production tax on existing oil fields. The former tax break is estimated to be not enough to cancel out the latter tax increase, resulting in an overall tax increase of 5.5 billion dollars. This means that the oil companies will incur greater costs by producing more from existing oil fields, which will discourage any increase in production from existing oil fields.

It is theoretically possible for Russian oil companies to raise the price of their domestic petroleum products to ease or absorb the increase in production tax, but they are unlikely to do so as Putin has requested a freeze of all utility charges for the next three years. Thus, it is uncertain whether Russian companies can invest in new development projects as their oil fields become less and less profitable, and there is the risk that the tax reforms will actually discourage investment in new projects. Meanwhile, if these companies seek to cooperate with foreign companies in order to promote development, it will be an opportunity for foreign firms, including those of Japan. We need to predict the future of Russian oil and gas development and its impact on foreign companies by evaluating the impact of each tax reform while looking at the overall picture.

## 5. EU Watching: Energy Infrastructure Projects of the European Commission

**Wataru Fujisaki**, Senior Researcher  
Global Energy Group 1  
Strategy Research Unit

EU countries are currently trying to integrate their energy markets and build a highly reliable, interconnecting energy infrastructure, to ultimately form a single energy market. On October 24, the European Commission announced the Projects of Common Interest (PCI), which is a list of 248 key energy infrastructure projects. The projects included in the PCI and endorsed by the European Commission will be given preferential treatment in licensing by the regulatory authorities of each country, and receive a subsidy, though modest, of 5.85 billion euros (760 billion yen) in total over the seven years from 2014 to 2020. Furthermore, merely being listed among the PCI is expected to enhance the feasibility of a project, making it easier to attract investment.

The projects adopted by the PCI include, for the transmission network, (1) the transmission line connecting wind power plants off the Irish coast to the European transmission network, and (2) the transmission line that runs north-south through Germany, connecting the North Sea wind power station with the demand center of southern Germany. Both are aimed at expanding the use of renewable energies. Ways of stabilizing the transmission network currently being considered include connecting Norwegian hydropower stations to the UK for load adjustment, and constructing new pumped-storage hydroelectric power plants. Furthermore, the three Baltic States, where the transmission networks are still not fully developed, have adopted a plan to integrate their three electricity markets. Regarding the upgrading of the gas transport networks, initiatives have been selected, such as modifying gas valve station to make them bi-directional instead of one-way, so that they can transport gas from underground storages and LNG terminals to Germany and Eastern Europe in case the gas supply from Russia stops, and constructing the Southern Gas Corridor which connects Europe and the Caspian Sea, Central Asia and the Middle East for importing gas from Central Asian countries such as Turkmenistan. Projects for constructing oil pipelines and testing smart grids have also been selected.

The purpose of the PCI is to optimize the overall energy infrastructure such as electricity transmission lines and gas transport pipelines for mutual gas interchange, which would not proceed if left to each infrastructure company, for the long-term vision of integrating the energy markets to improve competitiveness, enhancing energy security and reducing GHG emissions. It is hoped that the PCI will ultimately benefit European citizens.

Private companies are not capable of investing in unprofitable transmission lines and gas transport pipelines. However, there are certain transmission lines and pipelines that must be built in view of security and competitiveness. This Europe-wide attempt to steadily improve the infrastructure has many lessons to offer. Japan should follow suit and target overall optimization in approaching infrastructure projects, allowing the power utilities to work jointly with the government on projects which a company cannot go ahead and invest in on its own, such as interconnection lines between power companies and building gas pipelines from other countries.

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