

Keynote Address (Abridged)

The Next Phase for Japan-Russia Oil and Gas Cooperation

MINAMI, Ryo

Director, Petroleum and Natural Gas Division, Agency for Natural Resources and Energy,
Ministry of Economy, Trade and Industry

I would like to talk today on the current status of Japan-Russia cooperation, and Japan's energy situation, and based on these how we would like to advance oil and gas cooperation with Russia.

Russia accounts for 5% of Japan's oil import volume and 10% for gas. The sources of oil imports of Saudi Arabia, the UAE, Qatar, Kuwait, and Iran are all Middle Eastern countries, and Japan's oil dependence is skewed toward the Middle East. In such a situation, the fact of being supplied from Russia, which is geographically extremely close to Japan, is heartening for Japan. As for LNG, the degree of dependency on the Middle East is growing less, but compared with Australia, Qatar, and Malaysia, Russia has the plus of being close to Japan. Listening to the talk of Japanese electricity and gas firms also, the time period from requesting delivery to arriving at the plant in Japan is short and there are advantages in business.

Looking at Japan from Russia, exports of oil to Japan are 2.2%, and gas is 5.6%, and in Russia which has been focusing on Europe to date, they think they are still able to increase this further.

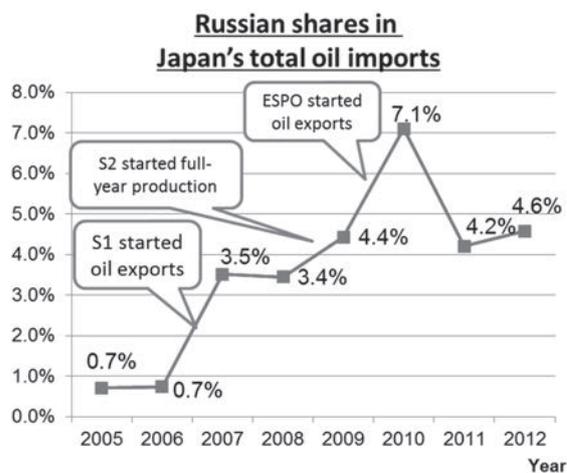
Regarding Japan-Russia energy cooperation projects, we made the Sakhalin I oil projects, and the Sakhalin II oil and gas projects the first stage, and in the future, as the second stage, we would like to continue moving toward the realization of a great many projects. Among which, the Vladivostok LNG project, as a base for supplying Russian gas to the Asia-Pacific, is an important project for Japan also, and we are moving it forward together with Gazprom. In addition, the Far East LNG project is an important

project which makes possible LNG supply to Asia. In addition the Magadan II and III oil projects are large oil projects which Japan and Russia are carrying out in collaboration for the first time.

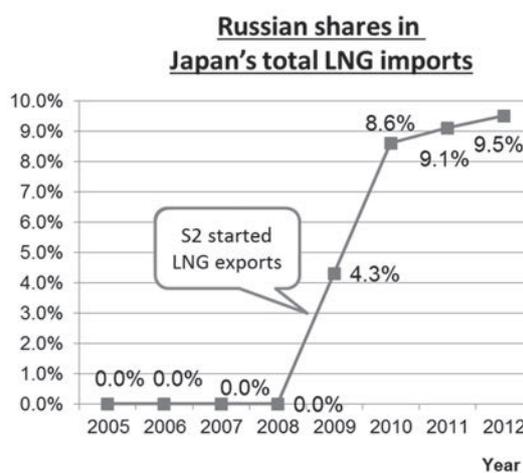
Actual results to date for relations between Japan and Russia have appeared. There were mostly no oil imports from Russia by Japan up to 2006. The Sakhalin I and Sakhalin II projects have got up and running, however, and with the Eastern Siberia-Pacific Ocean (ESPO) pipeline being completed, imports from Russia have steadily been increasing. There were no imports of LNG to 2008, but the Sakhalin II project has got up and running, and currently approximately 10% is being imported from Russia. Making best use of this trend, I would like to see projects furthered, centered on the Vladivostok LNG project, the Far East LNG project, and the Yamal LNG project.

On the other hand, there is a situation for energy in Japan which I would like the people on the Russian side also to understand. The burden of Japan's LNG imports is something that has become extremely large. The Great East Japan Earthquake occurred, nuclear power plants stopped working, and due to electricity generation being started with LNG and oil in place of nuclear energy, the burden of that fuel has grown extremely high.

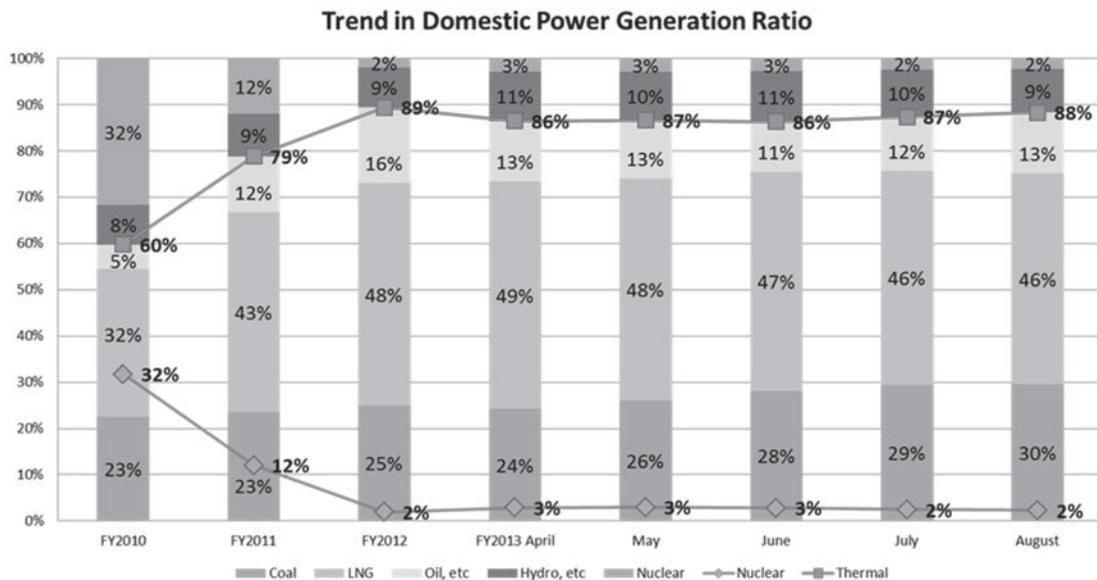
With the impetus of the Great East Japan Earthquake, Japan's electricity generation structure has been changing greatly. For 2010, before the earthquake, the share of nuclear electricity generation was 32%, and the share of the fossil fuels gas, coal and oil was 60%. As of August 2013 that had become a situation where nuclear electricity



Source : Natural Resources and Energy Statistics



Source : MOF Trade Statistics



generation was 2% (two plants). One part which Japan has increased is LNG, and was originally 32% but presently has increased to almost half. The next part to have increased is oil, which was 5% but has grown to 13%. The costs of both LNG and oil thermal power are mostly fuel costs, and that burden has greatly increased.

The volume of LNG imports was approximately 70 million tonnes in 2010, but was forecast to grow to approximately 90 million tonnes for 2013, an increase of 20 million tonnes, approximately 30%. Not only the volume, but also the price has risen, and the burden has doubled. The price of Japan's LNG imports was approximately US\$10 in 2010, and at US\$15 at the present time the unit price has risen approximately 50%. The volume has increased 50% and the unit price 50%. From 2010 to 2012 there was an increase of 2.5 trillion yen in the burden for LNG from 3.5 to 6 trillion yen, and there was an increase in the burden of approximately 3 trillion yen for oil, and 200 billion yen for coal. The burden for fossil fuels in their entirety, including petroleum products, increased by approximately 7 trillion yen.

With the fossil fuel burden increase also a major factor, in 2011 Japan's trade figures went into the red for the first time in 31 years, and a trade deficit of approximately 5 trillion yen was recorded for 2012, and approximately 8 trillion yen for the 2012 fiscal year. As Japan is a country that has basically posted trade figures in the black, it is a huge shock that a trade deficit is recorded as large as this, and reducing this has become an issue for the government.

For us also, we have to reduce Japan's fuel cost burden and LNG burden, and are taking several measures. As for measures on the aspect of demand, one is the confirming of the safety of nuclear power plants, and whether or not to put them into use. The review of safety has already begun, and there are currently requests for the restarting of 14 of the 50 nuclear plants in Japan. Second is the obtaining of LNG cheaply. It is important that the buyers from electricity and gas companies have the motivation to attempt to purchase cheap gas, and they are changing the assessment method for fuel costs and adopting the top runner method.

Previously, imputing the purchased fuel costs as they were to fuel costs was allowed, but altering this, attempting to assess electricity costs with low-price LNG as the criterion is being introduced from this year. Third, there is the reevaluation of coal thermal power. Coal thermal power has problems from the environmental respect, but is superior in economic terms. Fourth, there are many areas that are being carried out along with Niigata, and we are striving to promote the development of methane hydrate as a domestic resource.

For measures on the supply side, first we would like to further the import of LNG from the United States. Up to around about last year, there were voices questioning whether LNG imports would be realized, but from May of this year export permits have been issued one after the other from the US government, and most recently on Friday of last week (15 November) an export permit has been issued for approximately 2 million tonnes of natural gas. From 2017, or thereabouts, it seems certain that the import of LNG from the United States to Japan will begin. Second, there are LNG imports from other regions, not just the United States, and we would like firmly to further imports from Russia also. Looking at the current situation for LNG, however, there are many sellers, such as the United States, Canada, Russia, Mozambique, and Australia, and it will be important that they strive for exports to Japan at competitive prices, and with competitive conditions. Negotiations with Russia will probably continue gathering momentum in the future, and if they can understand Japan's circumstances and deal with them, it seems that Russia and Japan's gas cooperation will go on deepening.

Lastly, I would like to expound on the fact that there is also Niigata, and on methane hydrate. Japan also is currently undertaking research and development for methane hydrate as a domestic resource. There is methane hydrate both on the Sea of Japan and Pacific coasts, and both are promising energy sources. Obtaining the cooperation of Niigata Prefecture and Niigata City from this year, there has been exploration undertaken for surface stratum methane hydrate on the Sea of Japan coast, and possibly existing structures have been found in 225

locations off Joetsu and Noto. A production test was carried out in March 2013 for sandy stratum methane hydrate on the Pacific coast, and we are taking action to aim for its commercialization at an early date. It may take somewhat more time compared to shale gas from the United States,

but getting the understanding of people on the Russian side that there are domestic resources in Japan also, we would like them to move cooperation forward in the future.

[Translated by ERINA]

Keynote Address (Abridged)

The Shale Revolution and Energy Security

TANAKA, Nobuo

Global Associate, The Institute of Energy Economics, Japan
Former Executive Director, International Energy Agency (IEA)

As I was formerly the Executive Director of the International Energy Agency (IEA), I have been watching the shale revolution with great interest. Today, the discussion of Japan-Russia relations is continuing, and amid the shale revolution and the changes in the energy situation, I would like to consider from a global perspective what best to do in order to have both Japan and Russia end up as winners.

The IEA issues the "World Energy Outlook" every year. In the 1970s, during which the IEA was created, most energy was consumed by the advanced OECD nations, but, recently growing to half, in the future all the more energy will be being consumed by developing countries and Asian countries, including China, India, the Middle East, and ASEAN. They will have to consider a framework of how energy would continue flowing competitively at that time. As energy resources, renewable energy and nuclear energy, among others, are continuing to grow, but still the greater part is fossil fuels. Amid the developing nations and others vying for this, it is necessary for the supplier countries, and Japan, to consider energy security and how to proceed.

Therefore what the IEA has focused attention on is the shale revolution in North America. Conventional oil is declining, but unconventional oil (light tight oil) production is increasing, and the same can be said regarding gas also. What impact will there be with the United States becoming the global number one in both gas and oil production? The United States will become a gas-exporter, greatly reducing its oil imports, improving its trade balance, and becoming the overwhelming winner; and it will be winner takes all.

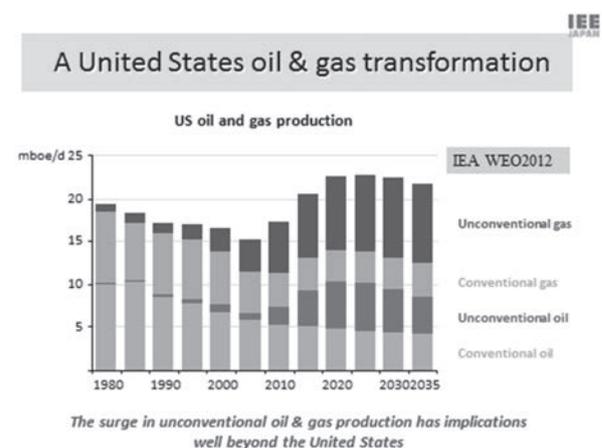
Since Fukushima, for Japan a critical situation has occurred in the short term, where nuclear power has not been working at all, and there are worries that it will become a great minus in competitiveness in the medium to long term.

That the United States will be independent of the Middle East in energy terms could have a major impact. The security of the Middle East, in particular whether the United States will continue its commitment regarding the free navigation of the Strait of Hormuz, will become a serious problem. It is the same for China and India also, and for Japan how to continue defending the sea lanes is not

somebody else's problem. China is aiming for energy security via pipelines, but for Japan of which 85% of its oil and 20% of its gas passes through the strait, if an Iranian crisis occurred it would be terrible. I think that the restarting of nuclear power is an important point within energy security.

That the gas supplier countries have become diversified via the shale revolution is all very good for consumer countries, but even amid the trade routes continuing to diversify Russia is still an important gas exporter country. For Russia's energy policy of extending the pipelines toward Europe to the west the time is probably coming to continue extending the pipelines to the east, via the development of Eastern Siberia and the Far East. In its relations with the large demand-side country of China, when Russia will be able to do a price deal is also an important point. Japan is also moving forward LNG projects, but naturally the possibility of pipelines will also be an important strategic decision.

Under such circumstances, what kind of price could gas be bought at? Up until before the shale revolution, Europe, Japan and the United States had all had similar price trends, but after the shale revolution began, Japan has been buying LNG at five times the price of that for the United States, and Europe three times that for the United States. When I was doing research at the IEA, the liquid fraction that comes out with the gas was called condensate





11

or was called natural gas liquid, but the more there is, the lower the price ends up being, and a situation has come into being via the shale revolution, where as the price of oil rises the price of gas falls. Japan has been buying gas linked to high-priced oil, but the changing of this formula is the current of the times. Putting to one side whether to buy at the spot price, and with an assumption of Asia and Japan continuing economic growth, for the gas supplier countries also a new price formula is necessary from the perspective of mutual benefit. The United States is pushing forward with its LNG exports, and may send it to Japan at perhaps around US\$10, and this will likely be a major trigger for changing the price. In the future through nuclear power restarting, and additionally the cheapness of United States' LNG, Japan's LNG price too will doubtless fall greatly.

They say that there is 100 times more methane hydrate than the US shale gas reserves. As to how to raise this above ground, Japan's furthering of technological development is an extremely important strategy.

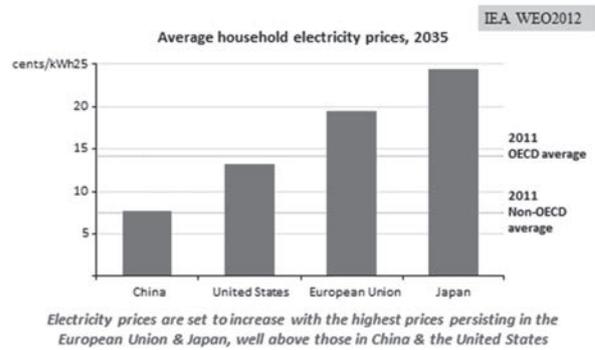
On the subject of hydrogen, Chiyoda Corporation and Kawasaki Heavy Industries are researching how to transport it cheaply as hydrogen. Japan has to buy LNG at twice the US price, and buying it at the price for hydrogen would be a highly likely technological innovation.

The future will be an era of using gas to generate electricity. Various countries have to make various investments in electricity, but as expected developed countries will depend greatly on renewable energy. The cost of renewable energy is high, however. Already close to US\$1 trillion has been committed via a fixed price purchasing system. A further US\$2.6 trillion will be applied as subsidies, and biofuel subsidies will also be applied. Japan will also use renewable energy in the future, and a high-cost electricity generating structure is unavoidable. In addition there is also the problem of the grid being divided east-west at 50Hz and 60Hz. The IEA has made a forecast of wide differences in household electricity prices for various countries to 2035. It can easily be understood how important the buying of nuclear power and cheap gas will also be for Japan's industrial competitiveness.

Nuclear power, with China central, will be used, and how Japan maintains this technology and shares the lessons of Fukushima with each country will be important. We must also develop fourth-generation nuclear reactors.

The issue of enhancing energy security is one of

Wide variations in the price of power



21

"diversity" and "connectivity". That is, creating networks with neighboring countries, and when they don't work smoothly, supplementation with nuclear power. Countries lacking in fossil fuels and natural energy sources supplement with nuclear power. In Europe different countries have a variety of portfolios, and by reciprocally linking them up have balanced fossil fuels, renewable energy and nuclear power. It is Europe that is mutually linking up pipelines, linking up grids, and aiming at the so-called collective security of a single energy market. In Asia, and most of all Northeast Asia, this kind of model won't be possible. While Germany can halt nuclear power, and buy electricity from France or electricity generated from coal from Poland, Japan cannot proceed so easily. Europe is striving to buy North African gas, wind power, and solar electricity. It is attempting to create a diversity of pipelines, and is also building LNG plants.

In Northeast Asia, they have created the "Northeast Asian Gas and Pipeline Forum" centered on Japan, Russia, Mongolia, China, and the ROK, and with Masaru Hirata being involved, a blueprint has been achieved. In China, the pipeline to Shanghai passing through the Tarim Basin from Turkmenistan has been put in place, but unfortunately Japan has not properly achieved any domestic pipelines. The situation with other countries is still one of routes being dotted lines. As to how to turn the dotted lines into solid lines, there is the idea for pipelines from Sakhalin, and also the idea of an 800km pipeline linking up to Niigata from Vladivostok. The distance of 800km is a mutually profitable distance for laying a pipeline. It is a rule of thumb that if it doesn't exceed 2,000km a pipeline is better than LNG, and would reciprocally serve national interests. For Russia, Japan has to be the most stable consumer nation. Via using the pipeline, there would be the merit of raising the value higher.

Masayoshi Son has often spoken about an Asian Super Grid, and I also have been told from Deputy Prime Minister Sechin: "Why doesn't Japan buy Russia's hydroelectricity?" Such an idea would also be a distinct possibility. However, as to how to consider the collective energy security in Northeast Asia, it is extremely important to consider in what way Japan and Russia take the leadership therein, and not only bilaterally. Not only relying on individual Japan-Russia projects, I think it would be good to consider the kind of picture to paint that would be useful to East Asian stability.

[Translated by ERINA]