Keynote Address

The Stormy Energy Future: Energy Security and Sustainable Strategy

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I am now at the Sasakawa Peace Foundation, but I was once the Executive Director of the International Energy Agency (IEA), and it was my job to state various lines of thought on energy security. The recent energy situation has also been greatly influenced by US foreign policy under President Trump, and is quite opaque as to what lies ahead. As for new global environmental problems, after the Paris Agreement there is the issue of how to implement it. The topic on which I will speak is "The Stormy Energy Strategy". Today I would like to speak, focusing on what kind of cooperation Japan and Russia can undertake, particularly from the vantage point of energy security and sustainability.

Just today the IEA's "World Energy Outlook" was released in London. The IEA is an organization created to handle crisis situations for oil, and was founded in 1974 when the first oil shock occurred. With stockpiling oil and getting through emergencies by releasing it onto the market as the IEA's aim, there has been stockpiling of oil three times in the past. These were the 1991 Gulf crisis, Hurricane Katrina in 2005, and the 2011 Libya crisis. Originally oil was a fundamental source of energy, and stockpiling it was a linchpin of energy security, but gradually every country has shifted its supply side from oil to natural gas, and furthermore by pursuing energy conservation, nuclear power, and renewable energy, the times of having to stockpile oil have gone. They have become times where comprehensive energy security resolving a great many issues at one stroke is necessary.

In particular the price of oil has fluctuated greatly, and I am also often asked if the price of oil will rise in the future or stay low for a considerably long time. The IEA has said the scenario of continuing low prices is possible, but there are several conditions for that.

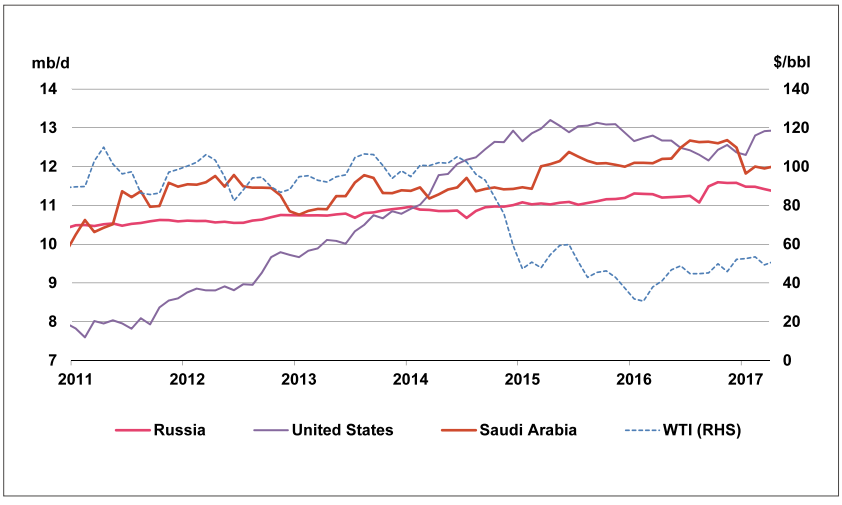
Saudi Arabia, the world's largest oil producer, has maintained balance by skillfully matching the ups and downs in price and adjusting its production as a swing supplier, but the United States, making use of high prices, increased its shale oil production, overtook Russia and was overtaking Saudi Arabia. This was the story in 2014 (Figure 1).

With this situation not ending, Saudi Arabia has changed its strategy. As they adopted a strategy of not reducing production even when the price falls, the price has dropped greatly. As expected, US shale began to fall to the US$30-level, and Saudi Arabia then had no choice but to curtail production, and Russia too cooperated in that. Then the price rose, and with the production of shale oil conversely having increased again, the world in the future will enter a period where the United States stands in an extremely strong position, with shale balancing the oil market and the United States taking the place of Saudi Arabia.

The United States has begun to talk of "energy independence". The sitting President, Trump, goes as far as to say "energy dominance", so how should we regard energy security in such a period?

In fact, an increase in demand of 14 million barrels is seen to 2040. While oil production is decreasing in many countries, there are several where it is increasing. US shale oil will peak in 2020, and its growth will gradually decline. The IEA's view is that Canada's oil sands and Brazil's deep sea fields will fall short, and the reliance on

Figure 1　The World's Largest Oil Producers



出所：IEA

Figure 2　Instability in the Middle East Is a Major Risk to Oil Markets

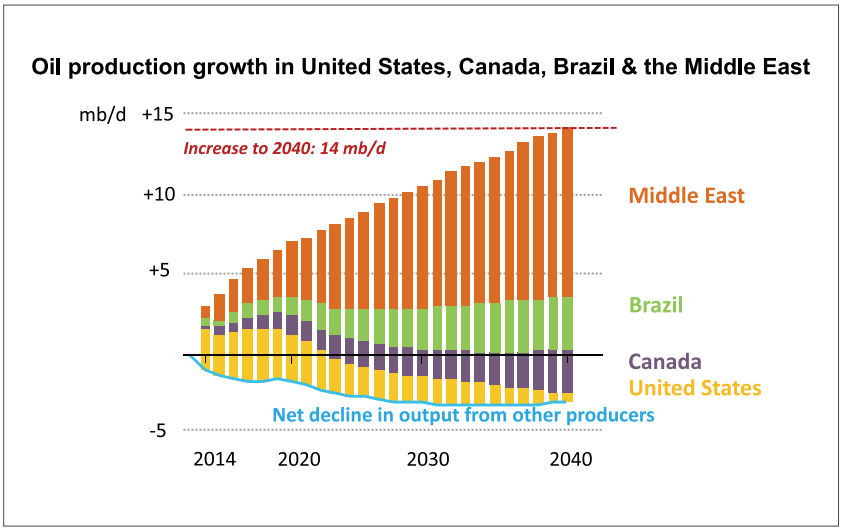


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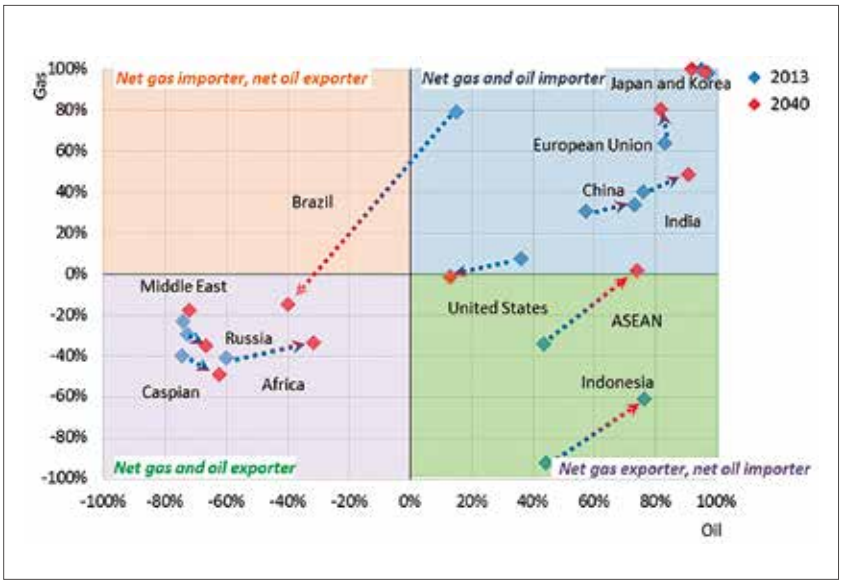
Figure 3　The Strategic Positioning of Oil and Gas Exporting and Importing Countries



出所：IEA

the Middle East will grow greatly (Figure 2).

When the oil price is low, the revenue of Middle Eastern countries decreases. As revenue decreases, it becomes difficult for the countries of the Middle East to spare money for public order, such as dispensing money to their citizens for the sake of national security. The Middle East will be driven to instability. Increasingly depending on such an unstable Middle East will result in a scenario of continuing low prices. While low prices are a good thing for importing nations, in fact it is best to think that there is great risk in the sense of destabilizing the Middle East.

Figure 3 shows the degree of dependence on gas imports on the vertical axis and on oil imports on the horizontal axis, and the countries importing both are in the upper right. As both Japan and the ROK have imports at 100%, their situation will not worsen. China imports 60% of its oil and 30% of its gas, and this is rising to the upper right. India is rising more forcefully.

Japan imports 40% of its gas from ASEAN, but as ASEAN will use it up domestically in the future, it will lose its capacity to export. With the United States as one of those to buy from, the United States is moving in the opposite direction. Gas has already come to be exported, and it is held that oil will also be exportable at some future date. Renewable energy-exporting countries will be extremely important, with buying from the United States and Australia as examples.

Assuming that dependency on the Middle East is reduced because it becomes unstable, the most important country will be Russia. How stable imports of gas and oil from Russia can be achieved is a common problem for the countries in the upper right of Figure 3. On the other hand, because the United States is accomplishing energy independence, dealing with the Middle East and Russia will be a

rather different matter than with other nations.

In 2035, China and India will see the necessity of large volumes of Middle Eastern oil, whereas the United States will not. Whether the United States will continue its commitment to date to peace in the Middle East and to the free navigation of the Strait of Hormuz will be a very difficult issue. I think it will probably continue its commitment, but there will definitely be talk of other large importing nations undertaking burden-sharing in the same fashion. Certainly Japan has created security legislation for dispatching minesweepers to the Persian Gulf in the case of an emergency, but in the future it will have to consider policy to promote stability in the Persian Gulf while cooperating with India, China, and others. That will probably be one method for a new collective energy security.

The IEA is also important. When I was Executive Director, because the oil imports of OECD and IEA countries were rapidly decreasing, while on the other hand in reverse fashion the oil imports of China and India were rapidly increasing, I made a request to Henry Kissinger and said that we should definitely get China and India to join the IEA, for the reason that China and India would cooperate together in stockpiling, and that the effect of not releasing the oil would be lost. Both nations still have observer status, and neither has become a full member, but it appears they will cooperate. I think he could understand that how to cooperate with China and India, and not only aiming at the OECD now, is a major issue regarding energy security.

Approximately 85% of Japan's oil imports and more than approximately 40% of global trade passes through the Strait of Hormuz. Japan indeed has a 180-day stockpile. The problem is rather one for gas, with Japan importing a large volume of gas from Qatar, and for Japan it has become the largest exporting country (approximately 20%). Chubu Electric depends greatly on this gas, and if passage of the Strait of Hormuz becomes impossible, 40% of its power supply will be lost at a stroke. In order to cope with this situation, naturally there is buying gas from elsewhere or, considered the quickest way, restarting the Hamaoka Nuclear Power Plant, but that is fairly difficult. The Strait of Hormuz problem when considered together with Japan's nuclear power situation is a very high-risk situation, and because there is the possibility of such Middle Eastern problems occurring far more frequently than a once-in-a-thousand-year earthquake and tsunami, Japan must put preparations in place. This is the great risk which I considered as former IEA Executive Director.

Qatar has been playing a very major role. Ever since the Fukushima accident, the great amount of what Japan has bought has been gas from Qatar. Qatar currently has no diplomatic relations with Saudi Arabia, and this has become a great problem. A great amount of oil is also being supplied from Iran. The oil supply from Iran in the future will change greatly depending on whether the United States will continue the nuclear agreement with Iran, annul it, or impose sanctions. If there is no stability in the Middle East, the oil price will not be stable, Japan too must carefully consider what state the Middle East will henceforth continue to be in. I think the cooperation of Russia and the United States would be a very worthy act for the stability of the Middle East.

At the G8 Summit held in L'Aquila, Italy, in 2009, I was invited to the lunch of G8 and African leaders hosted by Prime Minister Berlusconi of Italy. Colonel Gaddafi of Libya was sat next to me, and he spoke at great length that Africa's present predicament was the fault of colonialism. Next President Mubarak, President Zuma, and others, also similarly said that colonialism was at fault, but following that President Obama stated that rather than colonialism, corruption was the problem. He said that colonialism was not the cause of corruption and the gathering suddenly went quiet. However, according to what I subsequently heard, the following year Gaddafi undertook a corruption eradication campaign.

Furthermore during that lunch, Gaddafi spoke to the DPRK about giving up nuclear weapons, at the request of the United States and Britain, but the DPRK would not listen. There were people who said that to the end they didn't think that the United States would contrive a war and that Gaddafi himself would be killed. As a result, this was to send a strong message to the DPRK. That is, events in North Africa had a great relation to Northeast Asian security. Looking at the results, the Libya question was a great failure for Obama and Hilary Clinton, who pursued it, but if the annulling of the agreement with Iran occurs, which Trump is now saying he would do, it would probably end up as exactly the same failure. I think it would then probably lead to pushing the DPRK to pursue nuclear weapons all the more, and to discussions with the United States becoming meaningless. For the reason that Niigata Prefecture lies close to Northeast Asia and the DPRK, I think it a good place to carefully consider such geopolitical questions.

In contrast to the demand for coal and oil not growing that much, natural gas and low-carbon energy will play an extremely important role in the future. Of course nuclear power is also growing, but it is widely held that renewable energy plays a large role. In particular it is notable in China, India, and elsewhere.

Because gas, centered on the United States and Australia, will grow in production greatly for some time into the future, for a while there will be a production surplus. With this situation good for Japan, low-priced LNG will be supplied in large amounts. Japan is currently purchasing 10% of its LNG from Russia. The IEA has said that in the future it will be more an era of LNG via pipeline. However, I am of the thinking that as Japan uses wholly LNG, would that alone actually be sufficient?

The LNG trade is largely concentrated in Asia. LNG terminals and platforms are concentrated in the East and South China Seas, and defense of the sea-lanes is becoming a major issue. With China's procuring of gas via pipeline rather than sea-lanes being considered pivotal to security, if they can make contracts with Russia in due course, they will purchase gas from Turkmenistan, Myanmar and Russia via pipeline. This is China's security strategy. In response to this, Japan is cooperating in the Persian Gulf and the Strait of Malacca, and while it is very likely they may not be able to cooperate with China in the South China Sea, I think it would be good to consider cooperation with China in other places.

Europe buys not only from Russia, but is also diversifying into LNG. Russia is looking for demand to the east, in preference to Europe. It is transporting natural gas from Yamal. Additionally, it is selling to China via pipeline. Japan is importing LNG from Sakhalin, but in the future I think a bilaterally pivotal problem will be becoming stable suppliers and consumers with a preference for building pipelines, and diversifying sources from Japan's viewpoint

and diversifying consuming areas from Russia's viewpoint to be able to create a win-win relationship. President Putin set forth a powerful initiative concerning Yamal, and also attended the naming ceremony for the LNG tanker "Christophe De Margerie".

The idea of building a pipeline to Japan from Sakhalin is said to be lower cost than LNG. In Asia also, the nations of ASEAN have been building a lot of pipelines. In East Asia there is also the idea of building a pipeline network.

Nations with a low degree of self-sufficiency and nations with little natural energy resources or fossil fuels are compensating for that with nuclear power. As nuclear power has halted in Japan, it is extremely fragile. Europe, by forging an electricity grid among various countries, has made its average degree of self-sufficiency approximately 50%, and is skillfully balancing fossil fuels, natural energy sources, and nuclear power. This can be considered collective energy security, as well as a collective sustainable strategy.

Germany is at the very center of Europe, is phasing out nuclear power, buys electricity generated by nuclear power from France, buys coal-generated electricity from Poland and the Czech Republic, exchanges wind power with Denmark, and has created a strategy making full use of its geographical advantages. Unfortunately this is not possible for Japan alone. There is also Masayoshi Son's Gobitech concept to bring electricity from the Gobi Desert to Japan. RusHydro of Russia also has a concept of installing electrical power lines from Sakhalin. There is also the concept of the Asia Super Grid of Masayoshi Son, who developed that. There is, too, the major concept of Global Energy Interconnection which the State Grid Corporation of China is undertaking. In this way there will be one strategy for connecting electricity networks. The Asia Super Grid concept is a major concept which Masayoshi Son set out at the Eastern Economic Forum in Vladivostok last year, and President Putin endorsed this as of interest.

That the nations concerned in global security continue to cooperate and open paths for nearby countries to continue to cooperate will be a matter which we naturally must consider as contributing to our policy. Therefore, we must actually put our domestic network squarely in order. Japan's weakness in having an east–west division into two voltages, 50 Hz and 60 Hz, became clear when the Fukushima Nuclear Power Plant came to a stop, and as expected the perfect-fitting creation of an electricity network will be an important issue.

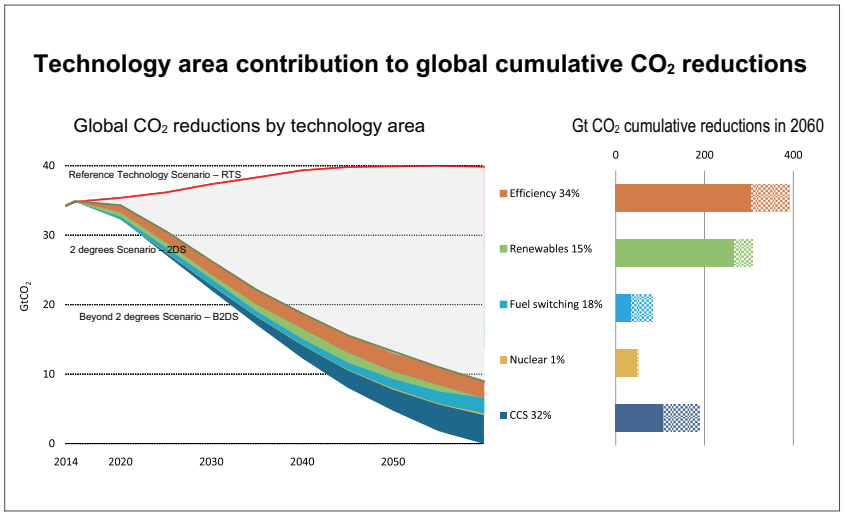
In the energy future sense, continued discussion is also important. Currently carbon dioxide emissions have been flat for three years. Will a decoupling occur where this is flat in the future, even with growth? The IEA has recently published the "Beyond 2°C Scenario", a 1.7°C scenario which goes even deeper than the 2°C scenario. If this continues we will reach net-zero emissions in 2060. To that end, not just renewable energy, but carbon capture and storage (CCS) will be necessary in large quantity (Figure 4).

In addition electricity storage is a new focus of attention, and the cost of batteries has been falling greatly. The IEA has begun to talk about the possibility of a change in business paradigm, bringing together electric vehicles and solar power. The cost of batteries will fall and electric vehicles will continue increasing. Currently 2 million vehicles are in use around the world, but there is the argument that for the 2°C scenario, 160 million electric vehicles will be necessary and for the 1.75°C scenario, 200 million vehicles.

Britain and France have announced that they will ban gasoline vehicles by 2040, and immediately prior to that the IEA had said that all governments will probably adopt such a strict policy, and the era of electric vehicles will quickly arrive. Much debate has taken place on whether the automotive industry in the future will greatly change its structure by way of electric vehicles, and the IEA has certainly predicted that.

Both Saudi Aramco and Russia are likely the same in planning for that. Peak oil demand may come unexpectedly soon. Saudi Aramco has minimal risks of putting part of its stock up for sale and of the demand for oil falling. I don't think it will happen straight away, but an era is approaching which may occur unexpectedly fast. In the same way, Russia is also an oil-producing country, and can no longer be disinterested about future oil demand. There is also the method of using next-generation new technology, for example by extracting

Figure 4　How Far Can Technology Take Us?



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hydrogen from oil and transporting it. There could also be the option of transporting Russian clean hydrogen to Japan, including for example hydrogen produced by hydropower. There could be another path for technology and cooperation via new methods, such as the Chiyoda Corporation's transportation and storage methods by methylcyclohexane.

Lastly, I would like to say something about nuclear power. Niigata Prefecture has the Kashiwazaki-Kariwa Nuclear Power Plant, and what will become of nuclear power in the future will be of greatly profound interest.

The IEA has also been saying that there is a continuing role for nuclear power in generating zero-emission electricity. However, after the Chernobyl disaster, the Three Mile Island accident and the Fukushima disaster, I can't help but think that it will probably be extremely difficult to continue building nuclear power plants on a large scale in the future.

China, India and Russia will probably continue building them. However, I think Japan and Europe will rather have a strong tendency to continue reducing nuclear power, aiming toward decommissioning of reactors. In the current circumstances, building new reactors is extremely expensive. In the case of the United States, just making use of its present reactors is losing out in competition, as gas prices are lower. Assuming that the paradigm of building new reactors and building them the same as in the past is extremely difficult, they must look for a different path for nuclear power. They should use reactor types differing from those to date, such as third-generation to fourth-generation reactors, small-scale reactors, fast reactors, metallic-fuel reactors, and passively-safe reactors, and continue to dispose of waste. For the reason that there is also a large volume of spent fuel in Niigata Prefecture, I think they should consider how to dispose of that locally and how to locate that locally. In fact in the United States there is the EBR-II, a reactor which is capable of that. Cost-wise it is also relatively cheap, and it is also capable of waste disposal. 100,000 to 300,000 years-worth of waste can be converted to 300 years-worth of waste.

My discussion is whether it is better to generate such sustainable nuclear power in Japan. The ROK is intending to do that. Russia also has that technology. Since it is US technology, how about constructing a new model with the United States and interested countries cooperating?

The Sasakawa Peace Foundation has actually undertaken a feasibility study. It has been said that the technology was excellent for disposing of the debris in Fukushima, and constructing this apparatus in the Fukushima Daini [No. 2] Nuclear Power Plant in order to dispose of the debris in Fukushima, we then attempted to estimate whether it would work, how much it would cost, and how much time it would take to be able to dispose of the debris. The estimate was it could be done for a total of some 200 billion yen.

Nuclear energy problems are not so simple, but if those in Fukushima take on board such a fact, then a reconsideration of nuclear energy in a new paradigm as a once-again dreamed of technology could be possible. Wouldn't doing so turn a potential disaster into an advantage?

With the Fukushima disaster, Japan lost the confidence of the world in Japanese technology and nuclear energy. However, although similar to the statement of the Doctor of Medicine Takashi Nagai who worked in the relief effort of the atomic bombing in Nagasaki, in some way by showing such actions in Fukushima, wouldn't it be a mission which the regaining of that confidence has imposed on Japan? I think that it would be a method for cooperating with Russia to that end.

[Translated by ERINA]