WEBINAR SUMMARY:

Global Conflicts and Japan's Energy Security

With Koichiro Tanaka, moderated by Dan Marks

Thursday 23 November 2023

Introduction by Koichiro Tanaka:
First of all, I would like to give you sort of an idea of where we stand when it comes to energy security. There are several key aspects and characteristics that people should understand from the very beginning. The first thing is that the self efficiency ratio of Japan in its energy resource is extremely low - roughly 11% in the year 2021, and it is not likely to increase or recover anytime soon because of the issues that we have with the nuclear power plants here in Japan. Following the 2011 Fukushima incident, there is also a heavy reliance on imported hydrocarbon resources, which amounts to over 90% in total, including coal, natural gas and oil. Our dependence on Middle Eastern oil is about 95%, which is extremely high. We have to move this oil out from the Persian Gulf region to Japan, and for that matter we rely on United States Naval forces, who provide security for our energy supplies.

The other aspect that we need to look into is that Japan is an archipelago, and therefore we are totally isolated from any neighbors. We are not connected with pipelines, be it gas or oil, and we are not even connected with power grids with our neighbors. Japan is totally isolated, so it means that we have to provide for ourselves when it comes to energy, I mean, importation is mostly what it is.

The other part is that there's strong opposition and skepticism over the use of nuclear power plants following the 2011 Fukushima incident, and that still remains, although in recent years the Japanese public has gradually been shifting away from this and has become slightly more welcoming to the rebooting of existing nuclear power plants here in Japan.

The last thing is that the island is divided into two: east and west, by the difference of the frequency of the electricity current. The Eastern part of Japan runs with 50 Hz, whereas the Western part of Japan runs under 60 Hz, and there's sort of a disconnect between the two regions.

The sources of concern that we share with a lot of States including UK and others is that we are affected by a lot of issues and conflicts that occur here and there, mostly in the Middle East because we are heavily reliant on oil in the Middle East. Back in 1973, with the fourth round of Arab-Israeli conflict resulting in the OPEC Oil Embargo as well as the 'Price Race' by countries, it caused a major shock to our economy and we are really afraid and concerned that it may happen again, under similar conditions and circumstances. In 1979, we observed the Islamic revolution in Iran and again Iran tried to decrease its oil exports to Major Western countries and we were affected again by that. Subsequently from 1980 to 88, the war between Iraq and Iran led to a total chaotic situation in and around the Persian Gulf region, and we were quite concerned that the war of tankers would hamper the exploitation or importation of oil. In the end, there was no major serious incident that did actually stop the flow of oil out from the Persian Gulf, but there were still many uncertainties.

Decades later, the 2022 Russian invasion on Ukraine actually did have an impact. Of course the Europeans suffered a lot more than we did, but even here in Japan, we are now importing over 95% of oil from the Middle East as I said earlier. The reason why this is the case is that we had to curtail and also stop our importation of oil from Russia which constituted roughly 5% of our total imports, so that made the final push to exceed the threshold of 90%. On top of this, the LNG supplies from Russia still continue to be a major issue for us, as we are now relying on roughly 10% of our energy imports from the Sakhalin-II project, that Japanese companies and also the government in a sense has a stake in. If the United States and G7 countries are to move further to place Russian LNG facilities under sanctions I believe that it's going to have a major impact on us and hopefully that won't, but there is still a possibility. Also, the Japanese have been investing heavily in the Arctic 2 LNG project and that in recent days has now come under scrutiny, and is placed under some sanctions by the United States and others.

There is also the war in Gaza that is ongoing and we're just seeing whether it's going to be sort of a pause in the hostilities at least for several days. This may have a similar impact on us - the issue is that it's not that we are dependent on Israeli natural gas. However if the war is still spread across the region then we might be under pressure to find other external sources to divert our energy supplies. This isn't that easy given the conditions that we are facing with Russia and also with other countries as well.

Back in 1973 we were in a panic, and therefore it has led Japan to consider a lot of things and establish its own policy for the future - we are now more prepared than ever, compared to those days. At least now we have reduced the share of oil as a source of primary energy here in Japan. Back in 1973, two-thirds of our primary energy source was oil, today it's down to one-third, so it has decreased significantly. Of course, it was taken over by LG and others but still, the dependency on oil has reduced

significantly. Additionally, while we still import a huge amount of oil from the oil producers in the Middle East, the actual amount has significantly decreased. Around 30 years ago, Japan was importing 4.67 million barrels of oil per day - that was the height of oil imports for Japan. Now, today in 2023, it is down to nearly 2.6 million
barrels per day, so there's a significant decrease in the amount of oil that Japan is importing.

The other part is that we now have the strategic oil reserve to play as a buffer if something goes really wrong, and to alleviate the shocks that may occur which didn't exist back in 1973. Japan is now much more prepared than we used to in the past. Also, if we look at how the Middle East oil producers are acting in these days, we do see a similar change that has occurred over decades: there's sort of a of coherence among the OPEC members although they unite themselves along with Russia and others to try to provide some sort of a breathing space when the oil prices are on its decline. Of course, back in the 70s the major oil importers from the Middle East were Western States, but now the major importers of oil are here in East Asia meaning China, Japan and South Korea, as well as South Asia like India. If the Middle East oil producers are to curtail their oil exports based on some ideological or political judgment, then those who are to suffer are not the West, rather it's going to end up harming their relationship with a country like China or India who are the major stakeholders of the future energy demand, so it is unlikely that it will work in their favour.

There are a lot of things that have changed since 1973, so we can be relaxed in a sense about that but yet there is one major problem which is not about oil but about natural gas. We've already witnessed that the Tamar offshore gas field run by the Americans and the Israelis in joint venture has shut down its activities ever since October 7th- the day when Hamas staged the terrorist attack against the Israelis. Now, the gas is not flowing into Israel but also to Egypt where the LNG facilities are run. Therefore there has been a significant shortage of natural gas or LNG. This strikes alarm bells about the winter in the Northern Hemisphere this year and towards next year. Here in Japan we are foreseeing that it won't be a harsh winter but if the cold is really going to hit the Western European States, I believe the shortage of LNG supplies may have a major impact.

There was a recent incident in Yemen, in which the Houthi movement hijacked a commercial vessel. If that sort of trade route was to be controlled by elements that aren't totally friendly to us or any Western State then the flow of oil from a state like Qatar towards Western Europe may be difficult.

So what are we trying to do here in Japan about the energy strategy for the future? Firstly, we have signed the Paris agreement, saying that we will adhere and commit ourselves to carbon neutrality by 2050. We think this will be impossible to achieve without rebooting the nuclear power reactors here

in Japan. We have also announced that we will reduce our carbon emissions by 40% compared to 2013, by the year 2030 which is only six years away from today. We are gradually moving towards that but it's not clear whether we can make it or not- again it requires a significant amount of effort by the government, as well as the local government and the populists to come to an agreement to reboot the nuclear power reactors.

Now I will talk about the strategic energy policy of 2021. By 2030, we are going to heavily rely on renewable energy - around 36 or 38% and nuclear energy would come next - roughly 20%, followed by 20% of LNG and so on. Whether we will be able to achieve the goal Targeted, will depend on our usage of renewable energies that we are trying to introduce here in Japan, like solar energy, offshore windmills or wind farms. We are also trying to significantly reduce coal and LNG usage, but whether we can achieve that or not is uncertain.

Next I will discuss the basic strategy for the realization of green transformation. This was recently also announced in 2023 again we are emphasizing the reliance on both the renewables and the nuclear power reactors. We also have this basic hydrogen strategy currently, but we are trying to develop a way of using liquefied hydrogen, MCH and ammonia as the transport carriers of hydrogen, but this will take years and decades.

The challenge that lies ahead is whether we are able to reboot the nuclear power plants, and whether we can rely on the new generation of nuclear power plants that are now under development. The most recent development that we heard from the United States was that the project that they have been trying to complete for the small modular reactors have failed, and this is going to impact us because the government was trying to introduce that here locally in Japan. The existing nuclear reactors are aging and some have failed as we have seen during the Fukushima incident, and we don't have adequate numbers of nuclear power plants that may still be functioning by the year 2030, and beyond. The government has adjusted its policies in recent months and now we are going to extend the lifetime or the life cycle of nuclear power plants from 40 years to 60 years and even beyond 60 years, but even by doing that we still are going to run short of nuclear power plants when the year 2050 arrives.

As I mentioned before, in the past two years, the Japanese population have become relatively softer in their opinion of nuclear power reactors than they used to be, following the Fukushima incident, That has come mostly from the eastern part of Japan for the past two years, as we have had sort of a power shortage in areas surrounding Tokyo and the tohoku area where the Fukushima power plants used to work. Now people have begun thinking that we need to reboot, we need to rely more on nuclear

power, and that made a major shift and the government has thus followed that trail. They have announced that they would not only vigorously reboot the existing power plants, but even that they would construct new power plants and also replace the aging reactors.

We are now trying to introduce a new set of energy like hydrogen as we mentioned before. The government of Prime Minister Ishida is keen on developing and preserving the green transformation strategy to maintain our own National Security, by increasing the level of energy self-sufficiency, and we could potentially use them under circumstances such as war. However I'm slightly concerned at how well the Japanese government will be able to incorporate the green transformation strategy.

Q&A with Dan Marks and Koichiro Tanaka

Dan Marks: I wanted to start with actually a bit of a comparison with the UK, and to get your view on the differences in how the UK and Europe handle energy security and how Japan manages energy security - in terms of oil and gas specifically. So Japan has a tendency to sign much more long-term contracts, whereas the UK and Europe tend to rely on short-term contracts. This has resulted in much higher prices in 2022 in the UK and Europe for gas but on the other hand, may mean that they're less exposed to particular regions, because if one region has a problem you just buy from another region. I was wondering if you could just dig a little bit into the differences and perhaps draw out a few, in terms of what works and what hasn't worked so well.

Koichiro Tanaka: Yes definitely, it's true that Japanese oil importers and gas importers rely on long-term contracts and that was the idea that was prevailing for the past few years, but I believe that the Japanese LNG importers have shifted away from long-term contracts, especially with a country like Qatar, uh which we had a longterm contract with until the end of 2021, but we terminated the contract. The reason why we shifted away from the long-term contract with Qatar was simply because they were imposing more conditions on the style of and also the volume of the LG Imports that we could buy. This was not so convenient for us, as we thought that the importers would have more flexibility, as there will be a good amount of LNG in the market for years to come.

When the war in Ukraine happened several months later, the LNG market spiked, and we now think that our decision may not have been the best, but the tendency of Japan to rely on long-term contracts has been dominant for some time now, basically because we consider that it would provide more security for our energy imports from wherever we are importing from, regardless of it being oil or LNG.

Dan Marks: You mentioned that Japan is involved in a few LNG projects in Russia, how does the country view the involvement with those export projects in light of also backing Ukraine quite publicly? How do they kind of fit those together?

Koichiro Tanaka: I mean these projects are already completed and the production is stable. The only thing is that we have a stake in it - both the Japanese private entities, and the government as well. So we do have the right to import and also buy this LNG, so we're not trying to relinquish that. Considering the vicinity and geographical proximity that we have with Russia, the LNG projects are sort of an asset that we need to keep as long as we can. Of course, it is conditional with how we are going to deal with Russia, given the circumstances what is happening in the war-zone in Ukraine, but the Japanese government is really adamant in keeping and maintaining the imports of the Sakhalin-II because as I said it it roughly amounts to 9 to 10% of our total LNG. It is not that easy to replace that with some other producers or exporters or suppliers regardless of being a long-term contract. Apart from the Sakhalin-II, we are also engaged in the Arctic 2 LNG project. We are not sure whether this is going to become successful or not. We may not be able to um pick up the LNG that might be produced from this project.

Dan Marks: Overall do you think that Japan's energy supplies are more at risk from geopolitical events and conflict, or is it actually more so to do with things like accidents and strikes in Australia which obviously were also causing concern?:

Koichiro Tanaka: Today, Australia is the number one LNG supplier for Japan and I believe that this will continue, again based on its relative proximity to Japan and also that the terms and contracts are not that rigid, as compared to the ones that we held with Qatar. That sort of an advantage has made the Japanese consider that we are better off making a deal with the Australians than with the Qataris. But the investment was quite a huge one, the LNG that we pick up from Australia is pricier than the ones that we have been picking up from Qatar.

Dan Marks: What are the options for diversification for Japan? I mean you've got 10% coming from Sakhalin-II, you've got a lot coming from Australia, which was threatened with strikes.

Koichiro Tanaka: That's a very interesting and also important question that you raised. Yes, we could divert our LNG ports to other resources, but then the question is where would it come from? Egypt? I mean sometimes yes, but now that the Tamar gas field is shut down, Egypt has no LNG to export. Oman does have LNG facilities but they themselves are short

of gas and that's going to be another problem.

Another way to answer the question is just what the government is trying to do to reboot nuclear power, so that we need less LNG. This is another reason why the government has been pushing so hard to do this. The only problem was that the public was mostly against it or had concerns over the safety of the facilities- people here in Japan were not ready for that. However, now it's gradually shifting, but the shift is so slow that it may not be enough for the government to finally meet the goals of 2030 or even 2050. Beyond 2050 there is no strategy for how to maintain carbon neutrality.

Dan Marks: I wonder has electrification played a role in the energy security debate in Japan like it has in China for example, where EVS are seen not only as a domestic industry but also as a strategic instrument for reducing oil demand and gas demand, thus reducing your strategic vulnerability?

Koichiro Tanaka: Yes, again that has been debated extensively but there is no clear-cut answer to that. Yes we could reduce the reliance on oil for transportation fuel for example, but then again the issue is now we will be running short of electricity. How are we going to generate electricity? Some may see through windmills or offshore wind farms, which sounded quite plausible until the Ministry of Defense interfered, with concerns that it's going to hamper their radar system for National Security, which is vital for our national security. I believe it is a major issue when we have a neighbor like North Korea shooting missiles every once in a while over Japan. So the idea of EVS isn't bad but the key to the answer is how are we going to generate electricity, and then again all arrows point to nuclear power stations.

Dan Marks: Yeah, that's an interesting point about radar and offshore wind turbines, I'll have to see what the UK views of that. I was also wondering about the role of coal- so there's still quite a big role for coal, obviously this is something from a decarbonization view that you might want to target, but from an energy security view, this may play quite a role. You mentioned that if Japan is short of power it might not be clear about how to deal with that, so I was wondering what the role of coal is in Japan's energy security. I mean if it comes from Australia, or if it's domestically produced and whether you know if there is potential to do more to reduce coal usage by 2023 or is it enough of a challenge to get it to 19?

Koichi Tanaka: This chart I showed during my presentation is the one derived from the strategic energy policy of Japan in 202, which does talk about the reduction of reliance on coal and also LNG, but if we compare that with the other existing OECD states, it is still a huge number. The only way to alleviate the emissions from the coal fire fired power plants is to combine them with the

use of ammonia or like introducing hydrogen in the combustion. That is the only answer that the government has come up with, and that in turn would mean that we are still going to burn coal, although we do foresee that it is going to reduce the amount of reliance on it. Only this year, during the months of June and July, two major coal fired power plants were founded, so that tells of how we are foreseeing our coal industry.

Dan Marks: One last thing, you mentioned that the grid's not synchronous in Japan and I was wondering why- if you could explain a little bit about why that is, especially as interconnection becomes increasingly important for decarbonization but also for energy security.

Koichi Tanaka: I believe that we are the only major country in the world that is faced with that kind of an issue, even today there is no way to resolve that. There is only a sort of intermission facility that lies in between that is going to convert the 60hz to 50hz or vice versa, but that sort of a facility has its own limits. Supposedly the East is short of power and the West is generating an excess amount of power, and only one GW can be transferred from west to east. Also there are four major islands that constitute the Japanese archipelago and even amongst them there is only a very thin line that connects these major islands. The island of Hokkaido, which is in the northern part of Japan may have excess power but still they cannot transfer enough power or the excess to mainland Japan, where Tokyo is and the same applies to the island of Kyushu. During summertimes, they have an over-capacity of solar PV that enables the entire island to run solely during the daytime, to the point that they need to shut down LNG fired power plants. The question is how to use that sort of an excess amount of energy power? One answer is to either transform them to another style of energy or store them in a way like in battery cells or find some other medium that could enable the transformation of the transfer of energy from one location to the other. Hydrogen and ammonia, these kinds of things come into play if the facility is adequate enough, but we still haven't invested in that sort of a facility. There is no major facility that generates hydrogen or ammonia at an industrial level.