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Energy Vulnerability of Taiwan, Japan, and Korea: Need for the Energy Dominance in the North-West Pacific

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Summary

The common weakness of Taiwan, Japan, and South Korea is energy supply. China can annex Taiwan by exploiting this weakness. This paper provides such a scenario, describes the energy security status, and proposes measures to improve it. Taiwan, Japan, and Korea should strengthen their fossil fuel supply chain. The U.S. should commit to supplying energy to them by ships flying the U.S. flags thereby establishing the energy dominance in the North-West Pacific.

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1 The Energy War Scenario: China Annexes Taiwan without Bloods

In my previous report, I discussed the geopolitics surrounding Taiwan, and pointed out that Japan's energy security is fragile, and suggested ways to strengthen it (Sugiyama 2024). In this paper, I argue that the energy supplies of Taiwan and Korea are also vulnerable, and make policy recommendations.

I begin with a description of an ominous scenario, in which China annexes Taiwan without a blood in three months.

“In November 2024, while the United States is in turmoil over the presidential election, Russia, having destroyed Ukrainian forces on its eastern front, begins the siege of Khiev. In the Middle East, Israel finally enters into a direct state of war with Hezbollah and Iran. In this world situation, “The U.S. has no room to intervene in East Asian affairs”, thought Xi Jinping. He orders the Chinese People's Liberation Army to conduct indefinite military exercises surrounding the entire island of Taiwan. Ships approaching Taiwan are subject to on-site inspections by government officials, and there emerges a huge traffic jam before they can enter the ports.

One day, three tankers are sunk in the vicinity of Taiwan by agents of unknown nationality. U.S. experts believe that the attacks were carried out by Chinese undersea drones, but no proof has been found. Cargo vessels coming to Taiwan, most of which have a third nationality in terms of owner, registration, captain, or crew, have all deny entry to Taiwan. As China had aimed, Taiwan's energy supply is depleted within two months, and shortages of goods and food are widespread.

Following the sinking of a cargo ship in Taiwan, the Japanese government issues a statement condemning China. The next day, however, two tankers bound for Tokyo are also sunk in waters around Japan by agents of unknown nationality. As in Taiwan, cargo ships have all refuse to come to Japan. Japan's domestic energy infrastructure is also severely damaged by cyber and terrorist attacks by unknown assailants. Taking this as a warning from China, the Japanese government refrains from condemning China, declares that Taiwan is a domestic issue for China, and issues a statement rejecting the use of the U.S. military bases in Japan upon military intervention in Taiwan by the U.S.

Taiwan holds secret talk with the U.S. on the pros and cons of a military war with China. The U.S. responds that she will provide arms and ammunition support and military satellite intelligence, but will not intervene directly militarily because she cannot effectively utilize its military forces, citing Japan's refusal to use U.S. bases as a reason. Taiwan gives up the idea of a military war, thinking that it cannot defeat China on its own.

In Taiwan, where energy and foods are in short supply to death, a sense of hopelessness spreads that the island has been abandoned internationally. President Lai decides to fly to Beijing to discuss an offer of humanitarian aid from China. This was the de facto negotiation of Taiwan's surrender, and Taiwan becomes under the control of the Chinese

Communist Party (CCP).

As no cargo ships comes to Japan following the sinking of tankers, the country becomes immediately plunged into power and energy shortages. The government institutes energy rationing and implements large-scale rolling blackouts and restrictions on electricity use, but the power and energy shortages causes the collapse of food logistics and cold chains, and leads to widespread food shortages and starvation to death.

Following the decision to annex Taiwan, as many as 200,000 Chinese troops move into Taiwan, and goods and food supplies from mainland China begin to arrive in Taiwan. In conjunction with this, third-country-flag cargo ships resumes coming to Japan, and Japan's energy, goods, and food shortages gradually improves.”

2 Energy Security of Taiwan and Korea

How weak the energy supply of Taiwan, Japan and Korea, and how can we deter China from annexing Taiwan? If energy supplies of Taiwan, Japan and Korea are reinforced and they can endure much longer than 3 months, say 6 months, a year or more, China would think twice before taking actions because the longer conflict poses more political and economic costs on China.

This section explains the background information of the scenario above, that is weakness of energy supply chain of Taiwan and South Korea. I have described the weakness of Japanese energy supply chain already (Sugiyama 2024). Some measures to reinforce energy supply chain is also discussed.

Taiwan

The joint study by the American Enterprise Institute (AEI) and the Institute for the Study of War (ISW) has elaborated a scenario of a Chinese blockade of Taiwan, titled “From Coercion to Capitulation”¹. In the scenario, China annexes Taiwan without military battles. The outline is as follows.

¹ <https://www.aei.org/research-products/report/from-coercion-to-capitulation-how-china-can-take-taiwan-without-a-war/>

- From 2024 to 2027, a de facto maritime blockade is imposed through a combination of military exercises surrounding Taiwan and on-site inspections of shipping vessels, cutting off the supply of energy, food, and other vital goods to Taiwan.
- Cyber-attacks and terrorist attacks will be used to destroy Taiwan's infrastructure and administrative functions.
- China threatens by launching missiles to the Pacific Ocean to prevent the U.S., Japan, and other nations from intervening militarily.
- The above will impoverish the Taiwanese people and spread a mood of resignation that Taiwan has been abandoned by friendly nations, forcing the Taiwanese government to come to the negotiating table for peace with China. This would effectively be the Taiwan's surrender.

The report, a 111 pages long, describes the scenario in detail. It also makes policy recommendations for Taiwan, the U.S., and U.S. allies (Japan is certainly in mind).

One question about the scenario, however, is why it would take as long as four years. Taiwan reportedly has six months' worth of food in stock, but its energy stockpile is extremely poor. Regarding oil, Taiwan have a little more than 100 days' worth in stockpile. However, the current stockpile of coal is only 40 days' worth, and the government is in the process of increasing it to 50 days' worth. Liquefied natural gas currently has only an 11-day stockpile. While they are planning to increase it to 14 days by 2027, it is still very poor.²

Taiwan's energy supply is very fragile, similar to Japan. The main source of energy is fossil fuels, which are almost entirely imported (Figure 1). The power generation sector relies heavily on coal and natural gas (Figure 2). Petroleum is used heavily in the industrial sector as well as the transportation sector (Figure 3).

² "Taiwan Vulnerable to 'Economic Blockade,' Energy Reserves Thin" (Nihon Keizai Shimbun, April 30, 2024, electronic edition, in Japanese)

<https://www.nikkei.com/article/DGXZQOGM267QG0W4A320C2000000/>

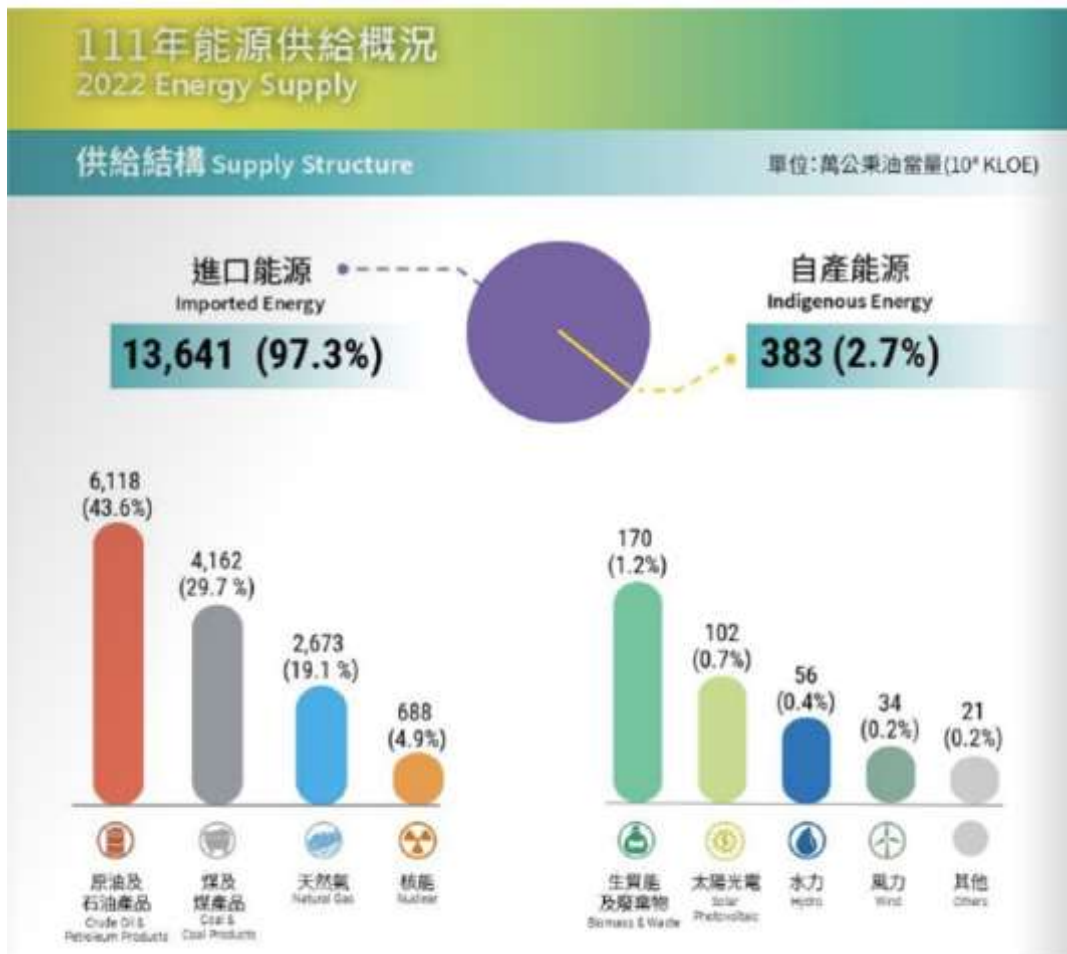


Figure 1: Taiwan's Energy Supply Structure (Rice 2023)

Taiwan's electricity generation, by source (In percent)

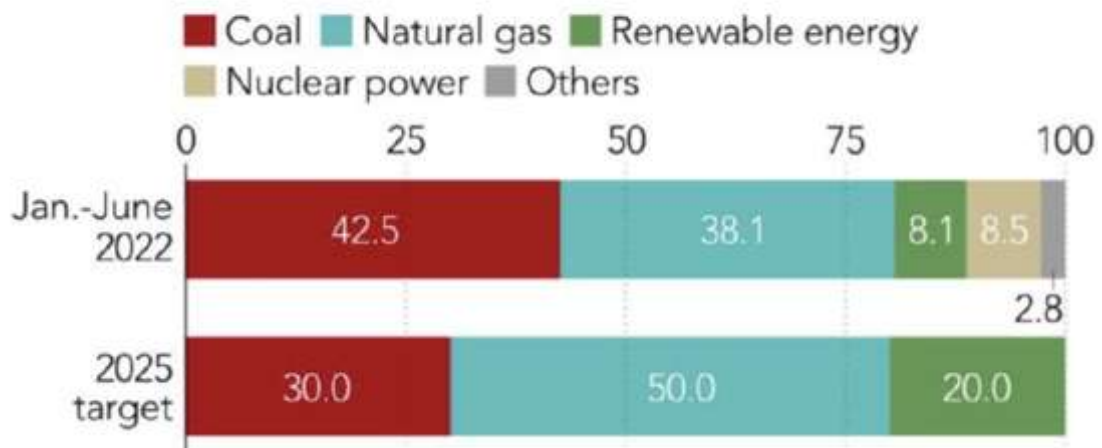


Figure 2: Taiwan's Power Generation Fuel Structure (Rice 2023)



Figure 3: Taiwan's Petroleum Product Consumption by Sector (Rice 2023)

As can be seen in Figure 2, the ruling party of Taiwan, DPP, has adopted a policy of eliminating nuclear power generation, and all nuclear power plants are scheduled to be shut down by 2025. The 20% renewable energy target is set for 2025, but this was lowered to 15% because it was deemed unfeasible. As such, Taiwanese heavy dependence on imported fossil fuels will continue for years.

Under these circumstances, if a sea blockade were to be imposed, Taiwan might be forced to stop operation of LNG-fired power generation in 11 days and coal-fired power generation in 40 days. Then 80% of power generation would be lost. Of course, the fuel would be conserved in case of emergency, but it would not last for more than three months. If cyber-terrorism or physical terrorism were to be used against energy facilities such as LNG terminals, Taiwan would run out of power even sooner.

Of course, if China were to overtly attack Taiwan's infrastructure, it would risk U.S. military intervention, so China would be cautious. However, there are many ways to avoid direct intervention. For example, if the attack is done by a Taiwanese terrorist

without explicit relation with China, it is not clear if the United States can use it as a reason to intervene militarily.

One of the report's recommendations for Taiwan is the use of nuclear power plants. This is not surprising in light of Taiwan's energy security situation. Fortunately, although they are planned to be decommissioned, Taiwan's nuclear power plants have not been destroyed physically yet, and it is possible to restart all of them, although it will take from one to several years, depending on the status of facilities (McGillis 2022). Nuclear power is also suitable for fuel stockpiling. The amount of uranium used in nuclear power generation is far less than that of fossil fuels used in thermal power generation, and if stored in the form of uranium oxide or nuclear fuel pellets, it will not degrade over the long term, and it will not be expensive.

Another notable recommendation in the report is to increase the number of Taiwan-flagged carriers. Currently, Non-Taiwanese ships such as Panamanian and other foreign registries' are responsible for much of the surface transportation to Taiwan. However, if there is a maritime blockade or physical attacks on vessels, foreign-flagged vessels may no longer sail in the waters surrounding Taiwan. Right now, the Houthi militia in Yemen is effectively blockading the Red Sea against ships of pro-Israeli nationality by threatening by missile and drone strikes. A similar situation could well emerge in the vicinity of Taiwan.

What would happen if just one tanker alone, in the midst of a Chinese blockade of the sea, were to be seen on the world's news clips, bursting into flames from a terrorist attack by an unknown attacker in the vicinity of Taiwan? Many vessels would choose to avoid sailing around Taiwan.

Of course, even Taiwan-flagged vessels might refuse to operate in such a situation. In which case the government may commandeer vessels. However, even in this case, if the Chinese authorities try to stop the vessels by force, Taiwan might be left with nothing to do.

One measure for Taiwan to counter this is to “use” U.S.-flagged tankers to import U.S. oil and gas. If U.S.-registered tankers are used to import U.S. produced oil and gas, it will be difficult for China to do anything about it, in fear of inviting U.S. retaliation. This idea has been discussed in (Sugiyama 2024).

Korea



Figure 4: Geography of Korea and Surrounding Area

In the event of a Taiwan contingency, the U.S. forces based in Korea may intervene in support for Taiwan, which might then become a target for attack by China. As a Japanese researcher put it, "Taiwan contingency *is* a South Korean contingency".³

In the event of a Taiwan contingency, cargo ships may not be able to pass through the waters around Taiwan. In addition, if China (or North Korea or Russia) threatens the waters around South Korea with missiles or drones, cargo ships may stop sailing. In the Red Sea right now, the Yemeni Houthis are forcing pro-Israeli (i.e., developed) nations to stop their navigation with just such threats.

If South Korea were to be subjected to a sea blockade, the economic damage would be

³ Ito, Kotaro (2023), Korean debate on the Taiwan Contingency, The Canon Institute for Global Studies (in Japanese) https://cigs.canon/article/20230329_7367.html

enormous, of course, but its Achilles heel is its energy supply.

Korean energy fragility is similar to that of Japan. Korea is highly dependent on fossil fuels as her energy source. Almost all fossil fuels are imported from overseas. Figure 5 shows that the domestically produced energy source is only nuclear power, and that the majority of primary energy supply is dependent on fossil fuels.

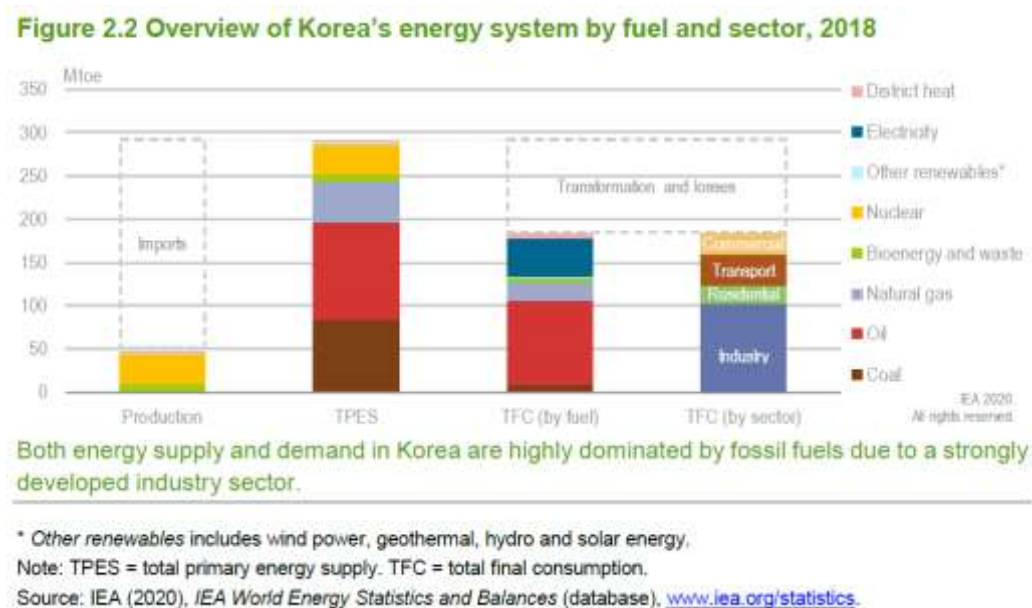


Figure 5: Energy Supply and Demand in Korea⁴

Oil stockpiling is conducted in accordance with IEA stockpiling rules, and the public and private sectors together are said to have more than 185 days of oil reserves⁵. However, for natural gas, there are only 37 days of reserves in addition to stockpiles⁶. Moreover, this is in preparation for demand increase in cold winter weather and supply delay in stormy weather, not for a maritime blockade.

If Korea were to experience a sea blockade, it would run out of fossil fuels for power generation within three months at best, even if it used them while conserving energy. Without power, economic activity is impossible, and food supplies becomes inadequate, and people may starve to death. As I have written on Japan, the modern food supply is highly energy-dependent (Sugiyama 2024). In normal times, 10 times the amount of

⁴ <https://www.iea.org/reports/korea-2020>

⁵ <https://www.iea.org/reports/korea-2020>

⁶ <https://www.iea.org/articles/korea-natural-gas-security-policy>

energy is used to obtain 1 calorie of food. Without energy, it is impossible to transport, refrigerate, and freezing foods. .

Food stockpiling is also a concern. Korea has a stockpile of rice, with the government purchasing 450,000 tons annually⁷. However, divided by a population of 51.63 million (in 2022), this is only 8.7 kilograms per person. This would quickly run out if a sea blockade were to be imposed. The food self-sufficiency rate is also low, as it is in Japan and Korea.

South Korea is better off than Japan in the power generation sector because it operates the entire fleet of nuclear power plants, but its geographic proximity to China, North Korea, and Russia makes the threat of a sea blockade much greater.

3 Policy Recommendation: Establish Regional Energy Dominance

Taiwan, Korea, and Japan face the imminent risk of a sea blockade. To improve this situation, Taiwan, Japan and Korea should strengthen their energy supply. I suggest that they 1) build more stockpiles of fossil fuel and nuclear fuel, 2) enhance protection of energy infrastructure against terror and military attacks, and 3) import fossil fuel in peace time from the U.S. under long-term contracts, using the U.S.-flagged tankers. The details have been discussed in (Sugiyama 2024) already for Japan. The recommendations thereof also apply to Taiwan and Korea.

The closest geographical location for the U.S. oil and gas is Alaska, where LNG carriers arrive in Japan in seven days, and Korea and Taiwan in additional two to three days. And the plan to develop and import Alaskan natural gas has been intensively discussed in past, with Japan and South Korea as the potential buyers, but so far no agreement has been reached to start the project⁸.

One reason for the stagnation is the de-carbonization policy. Both Japan and South Korea have set a goal of zero CO₂ emissions by 2050. On the other hand, even if they start now, Alaska's natural gas supply is not expected to start until 2030 at the earliest. It is normal for a big infrastructure project such as liquefied natural gas supply to take

⁷ Central Daily of Korea 2021.09.16 12:04 (Japanese version)

<https://s.japanese.joins.com/JArticle/283046?sectcode=300&servcode=300>

⁸ <https://www.wsj.com/articles/u-s-allies-in-asia-s-nub-natural-gas-from-alaska-project-e54f754a>

a long time to pay back the investment, say 20 to 30 years. Therefore, if the natural gas industry really decarbonizes in 2050, it will not be able to recoup its investment because the demand for natural gas will disappear. In face of the national security crisis, the decarbonization policies of Taiwan, Japan and Korea must be modified.

Purchasing U.S. oil, gas, and coal, not only from Alaska, but from the geographically distant U.S. West Coast and U.S. Gulf Coast, would be an important option for Taiwan, Japan, and Korea to be resilient against a maritime blockade. Utilizing existing export capacity may well be attractive as an urgent security measure, as it can be done more quickly than a new project in Alaska.

Current U.S. President Biden has repeatedly stated that "climate change is a greater existential threat than nuclear war" (!), so there is little hope for expanding U.S. energy export. However, if a Trump administration comes to power, the U.S. can fairly recognize that China is more imminent threat than climate change, and becomes more positive in exporting fossil fuels to Taiwan, Japan and Korea. Of course it will be also commercial interests of the U.S.

Taiwan, Japan and Korea may prefer to bilaterally work with the U.S., but we can envision a multilateral treaty, in which parties can cooperate on multiple issues. The outline may be as follows.

Taiwan-Japan-Korea- the U.S. Treaty for Energy Dominance in the West-North Pacific

1. U.S., Taiwan, Japan and Korea cooperate to ensure the stable energy supply.
2. Taiwan, Japan and Korea will strengthen their energy reserves and strengthen anti-terrorism and military defensive measures of energy infrastructure. .
3. U.S., Taiwan, Japan and Korea will interchange oil, gas, coal and nuclear fuel energy in case of emergency.
4. The governments of U.S., Taiwan, Japan and Korea will promote long-term contracts for oil, gas and coal energy supply.
5. U.S., Taiwan, Japan and Korea will increase the vessels of their own registry and the U.S. registry for energy trading.
6. U.S., Taiwan, Japan and Korea will jointly develop gas fields and export infrastructure in Alaska, concluding long-term contracts lasting 30 years or more, using the U.S.-flag vessels for transportation.

7. The maritime security organizations of the U.S., Taiwan, Japan and Korea will work together to ensure the safety of maritime energy transportation.

For the U.S., deterring Chinese offensive to Taiwan, Korea and Japan is the key national interests. The international framework with focus on energy security, instead of climate change, may serve as a better international framework governing energy issues than the Paris Agreement that is plagued by simplistic view on energy.

References

McGillis, Jordan (2022) Taiwan's Nuclear Option. The Breakthrough Institute.

<https://thebreakthrough.org/journal/no-18-fall-2022/taiwans-nuclear-option>

Rice, Jackson (2023). "The Resilience of Taiwan's Energy and Food Systems to Blockade," Center for excellence in disaster management & humanitarian assistance, University of California San Diego school of global policy and strategy)

<https://www.cfe-dmha.org/LinkClick.aspx?fileticket=sJ7hhDPJF18%3D&portalid=0>

Sugiyama, Taishi (2024) Geopolitics around Taiwan and three Proposals for Japan's Energy Policy, Working Paper No. 24-014E, The Canon Institute for Global Studies.