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Implications of Taiwan's dependence on imported energy

Sean M. Davis

Taiwan occupies a unique geopolitical position, often in conflict with China. Its energy sector represents a key vulnerability as it attempts to mitigate Chinese aggressions and influences. This article examines how Taiwan's dependence affects its geopolitical position and economy, exploring strategies for strengthening its position through a transition to renewable and clean energies and through strategic supply chain management to counter Chinese pressure.

Introduction

Taiwan's energy sector mirrors its precarious geopolitical position. The island imports 98% of its energy, 90% from nonrenewable sources—coal, oil, and natural gas (Togu, 2020). This heavy import reliance leaves the island vulnerable to external political influence, supply disruptions, potential blockades, and, in extreme scenarios, military aggression. A stable energy market is especially important to maintaining the competitiveness of Taiwan's manufacturing-focused export economy and managing geopolitical vulnerabilities. Taiwan must strategically address its energy portfolio. The island's sovereignty and economic prosperity rely on reducing its energy dependencies, which create significant leverage for China. Expanded renewable capacity, revitalized nuclear production, and diversified import partnerships can curtail that leverage while insulating Taiwan's competitive export-oriented economy.

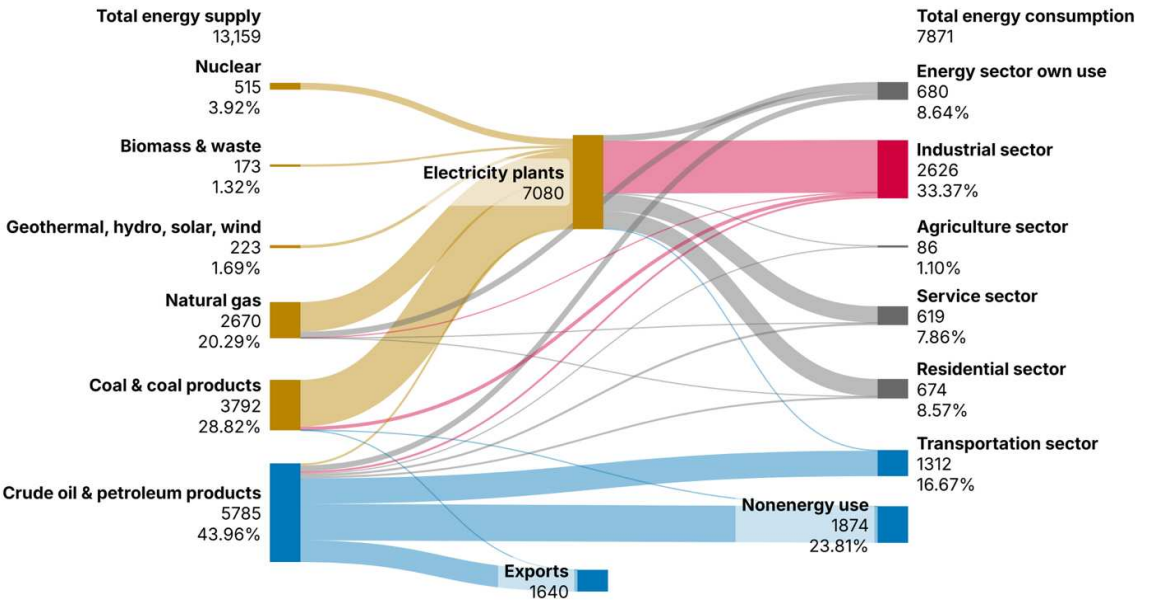
Taiwan's energy landscape

Taipower, which produces 64% of Taiwan's electricity (Energy Administration, 2024), operates as a vertically integrated monopoly controlling the generation, transmission, and distribution of electricity and energy (Taiwan Power Company, 2024). Its aging grid is notably unreliable (Bui et al., 2024), and, despite modernization (Taiwan Power Company, 2023), integrating intermittent renewable energy sources into the grid remains difficult. This reliability problem is evident in the island's recent history. Grid reliability problems led to blackouts in 2017, 2021, and 2022. The 2017 blackout affected 151 companies in industrial parks and export zones as well as almost 50% of households, causing NT$87.5M (US$2.7M) in losses (McGillis, 2023). Excessive power demand, which Taipower could not satisfy, triggered a rolling blackout in May 2021 (Energy Administration, 2024). To understand these challenges, Taiwan's current energy mix and its implications for energy security are examined.

Taiwan's energy landscape is heavily dominated by fossil fuels. As Figure 1 illustrates, collectively oil, coal, and natural gas comprise more than 93% of the energy mix, with the remaining portion coming from nuclear power and renewable sources. This heavy reliance on imported fossil fuels leads to significant energy security concerns that shape Taiwan's energy policy decisions. Oil products constitute almost 44% of the energy mix (Energy Administration, 2024). The main suppliers are Saudi Arabia (31%), the United States (27%), and Kuwait (18%). Unlike other fossil fuels, oil remains prominent in total energy contributions because of its role beyond electricity generation (Boone, 2023). Taiwan uses petroleum products for transportation, direct industrial energy, and as a critical resource for nonenergy applications, such as lubricants and raw materials for plastics or solvents (U.S. Energy Administration, 2023).

The second most significant fossil fuel in Taiwan's mix is coal, which contributes nearly 29% of its overall energy, including generating more than 42% of electricity (Energy Administration, 2024). In 2023, Taiwan's coal came primarily from Australia (51%), Indonesia (26%), and Russia. While coal may be a poor choice for the environment, it has significant strategic advantages: Taiwan's main supplier, Australia, lies largely outside China's sphere of influence (Webster, 2023), and coal is easy to stockpile for use in blockades or other disruptions (Fryer & Szladow, 1973). However, coal's role is set to diminish under Taiwan's climate commitments. In 2022, Taiwan's National Development Council released a 2050 net-zero roadmap, pledging to halt construc-

Figure 1
Energy supply and consumption flowchart, Taiwan 2023



Note: Energy supply and consumption in 10^4 kiloliters of oil equivalent.
Data source: Energy Administration, 2024.

tion of any new coal-fired power plants by 2025. The roadmap outlines the intention to completely phase out coal, relegating it only to a backup role.

Completing the fossil fuel portfolio, natural gas comprises more than 20% of the energy mix and generates nearly 40% of electricity (Energy Administration, 2024). Consumption increased in 8 of the 10 years from 2013 to 2023, with only 0.34% produced domestically in 2023. The largest suppliers include Australia (40%), Qatar (28%), and the US (10%). Collectively, nonrenewable thermal sources (oil, coal, and natural gas) contribute 83% of Taiwan's electricity.

Beyond fossil fuels, nuclear power—used exclusively for electricity—represents a minor share, just over 6% of electricity and about 4% of overall energy consumption (Energy Administration, 2024). Despite its potential for energy security, nuclear power faces significant political headwinds. The 2050 net-zero roadmap commits to shutting down all nuclear reactors by 2025. Three of the island's six nuclear reactors have been shut down, and two were never activated, leaving only one operational (Hilton, 2024). The latest shutdown stemmed from inadequate storage for used nuclear fuel pods (World Nuclear Association, 2024a).

Public opposition has been a major factor. Taiwanese citizens generally distrust the government's handling of nuclear waste (Fan, 2021). Since 1982, the government has stored nuclear waste in the Tao tribe's homeland, generating environmental justice concerns and public resistance to nuclear power. The government's failure to reconcile with the tribe and remove the waste has left the community disproportionately impacted. The Fukushima disaster in Japan further heightened skepticism about nuclear safety (U.S. Energy Information Administration, 2016). From a supply perspective, Kazakhstan accounts for 43% of global uranium production (Webster, 2023). Its close ties to Russia and China mean the two countries could easily disrupt the flow of uranium to Taiwan. However, Canada and Australia ranked second and fourth, respectively, in uranium production in 2022, making them viable suppliers for Taiwan's nuclear energy (World Nuclear Association, 2024b).

Renewable energy sources represent a growing but still small portion of Taiwan's energy portfolio. Combined, nuclear, biomass and waste, and renewable sources (geothermal, hydro, solar, and wind) comprise less than 10% of Taiwan's electricity (Energy Administration, 2024). Geographic constraints curb expansion options. Geology and geography limit the economic viability of geothermal energy (Wang et al., 2021), while droughts undermine hydropower reliability (Huang, 2021). Additionally, offshore wind capacity presents unique challenges due to geopoliti-

cal tensions. Following Chinese aggressions, Taiwan has encountered supply chain disruptions critical to the equipment required to build offshore wind farms. With each military drill, Taiwan has become more adamant in reducing dependency on China for equipment supply chains (Yin, 2024).

Taiwan's energy system faces significant vulnerability with its lack of storage. Current stockpiles are a scant 39 days of coal and 11 days of natural gas (Kucharski, 2022). Supply disruptions would cause severe economic impacts within two weeks without contingency measures for consumption sources or stockpile management. Recent expansions in storage solutions remain inadequate. Taipower in 2022 completed construction of Taiwan's first solar energy storage facility—now its largest energy storage facility of any type. It can store just 20 MW, only enough electricity for 40,000 households for one hour (Taiwan Power Company, 2023). While construction of new energy storage facilities is promising, the scale of potential capacity falls far short of compensating for the intermittencies associated with renewable sources, or for other supply disruptions.

The combination of insufficient storage, thin supply margins, and geopolitical tensions is a perfect storm threatening Taiwan's energy security. Energy security requires an approximately 25% buffer between supply and demand (Hilton, 2024), but Taiwan's buffer shrank to 5% in 2024, making the system particularly vulnerable to disruptions. This creates a strategic dilemma: Taiwan seeks less economic dependence on China yet relies on Chinese suppliers for solar and wind infrastructure. To develop renewable energy, Taiwan must balance long-term energy security against short-term economic independence from China.

Geopolitical and economic background

Taiwan, officially the Republic of China, sits in a precarious position, facing regular aggression from its neighbor across the Taiwan Strait. In May 2024, Chinese forces encircled the island and released military propaganda expressing disapproval of the newly inaugurated president (Jash, 2024). Such actions occur frequently. China conducted military drills simulating a blockade of Taiwan twice in 2024 alone (Chang & Regan, 2024), its navy notably crossing into Taiwan's maritime contiguous zone and edging closer with each exercise. China assertively promotes its One China principle, claiming Taiwan as an inalienable, renegade province of the People's Republic of China to be reclaimed (Mission of the People's Republic of China to the European Union, 2022). On this basis, China persistently reinforces its claim on the island by retaliating against states that recognize Taiwan as sovereign, leaving it with little formal recognition internationally. Even the US, a key ally, does not formally recognize Taiwan's independence (Bureau of East Asian and Pacific Affairs, 2022). Without United Nations membership, Taiwan can attend but not participate in UN climate meetings (Hilton, 2024), which is especially damaging when these conversations revolve around global transitions to renewable energy.

Taiwan boasts strong economic performance, with GDP growth averaging 3.4% annually from 2016 to 2021 (Ministry of Foreign Affairs, Republic of China [Taiwan], 2024). GDP totaled $757B in 2023 (International Monetary Fund, 2024). The industrial sector drives almost 38% of the economy and is particularly sensitive to energy prices owing to its energy intensity (Ministry of Foreign Affairs…, 2024), consuming the largest share of energy (33%) of any sector in the economy (Energy Administration, 2024). As the global leader in chip manufacturing, the Taiwan Semiconductor Manufacturing Company (TSMC) has become central to Taiwan's diplomatic strategy and economy. TSMC's energy use grew 85% from 2017 to 2022, 30 times faster than the industrial sector average (Fairley, 2024). At current growth rates, TSMC will soon consume 12.5% of Taiwan's electricity, more than all civilian households combined (Hilton, 2024). Thus, TSMC plays a critical role in Taiwan's geopolitical and economic policies. Yet that dominance comes with a substantial downside; the company is projected to consume as much electricity in 2030 as the entirety of Belgium did in 2022 (International Energy Agency, 2022).

Geopolitical vulnerabilities of Taiwan's energy landscape

Geopolitical tensions and foreign power dynamics can disrupt Taiwan's reliable energy supply. Taiwan imports most of its oil from the Middle East (Webster, 2023), where China has increased its presence. For instance, for Oman, which supplies 7% of Taiwan's oil, 33% of its GDP comes from oil exports to China (Webster, 2023). Taiwan not only depends on Oman's cooperation for reliable oil pricing and availability but also must consider the sway China has with Oman, given Oman's economic ties with China. China has expanded its role in the Middle East through trade relations that revolve around oil (Eslami & Papageorgiou, 2023). China has also built a presence in the Middle East to encompass economic, geopolitical, and strategic partnerships beyond

being merely a large oil customer. China could leverage this power to pressure Middle Eastern countries to restrict oil exports to Taiwan.

While the US, Canada, or other sources could provide oil, Taiwan's refineries are designed for oil with a specific composition. Middle Eastern oil contains more sulfur than oil from other regions of the world (Huang, 2008), and Taiwan's refineries are optimized to process this high-sulfur oil. Taiwan could potentially source high-sulfur oil from Canada via the US (U.S. Energy Information Administration, 2022). Canada has demonstrated resistance to Chinese pressures, as evidenced by the arrest in Vancouver in 2018 of the major Chinese firm Huawei's chief financial officer (who is the company founder's daughter) (Morris, 2021).

Taiwan fulfills another 61% of its oil supply from members of the Organization for Petroleum Exporting Countries (OPEC), including Saudi Arabia, Kuwait, the United Arab Emirates, and Iraq (Webster, 2023). While oil contributes minimally to Taiwan's electricity production, it remains essential for other energy needs, military operations, and nonenergy industrial uses. OPEC is notorious for price manipulation. A cartel accounting for over half of oil imports is a threat to a stable energy availability and leaves Taiwan vulnerable to diplomatic exploitation. This vulnerability to price increases or supply disruptions outside its own sphere resembles Germany's situation when Russia used natural gas as a key tool of foreign policy. Russia decreased shipments at the start of the Russia–Ukraine war, damaging German productivity (Chen et al., 2023).

In short, Taiwan's geopolitical position as highly energy dependent embodies dual vulnerabilities: directly through potential Chinese aggression and indirectly through foreign price manipulation by nations vulnerable to Chinese coercion. China leverages this energy dependence by influencing the very nations Taiwan relies on for energy security.

Political implications in reference to TSMC

TSMC plays a vital role in Taiwan's industrial sector and provides a level of protection for the island. TSMC manufactures ~65% of the world's semiconductors and ~90% of the most advanced chips (Hilton, 2024). Combined, Taiwan's chip manufacturing companies hold 68% of the global market. This dominance means the global technology supply chain has a vested interest in peace across the Taiwan Strait to protect a reliable stream of chips. This global dependency on Taiwan for semiconductors and, especially, advanced chips creates what is known as the "silicon shield." A Chinese invasion would disrupt fabrication plants, harming China's own economy, while the US would refuse to let the critical chip manufacturing fall under Chinese control (Wu, 2024).

In addition, TSMC contributes approximately 15% of Taiwan's GDP. Unreliable or expensive energy could undermine TSMC's global competitiveness, weakening both the integrity of the silicon shield and the larger economy. The manufacturing sector, including TSMC, is both energy intensive and highly sensitive to energy disruptions and price increases. Rising energy costs are already having an impact on industry profitability. Electricity accounts for 22.4% of expenses across the 37 industrial sectors, and, after a 15% electricity price hike in 2022 (Bureau of Economic and Business Affairs, 2023), energy costs will only increase for industry (Wu et al., 2018). The high and growing energy consumption rate by TSMC and the rest of the manufacturing sector will cause significant challenges when almost a quarter of expenses already go to energy, threatening global competitiveness—a cornerstone of Taiwan's export-oriented economy.

The Cross-Strait Economic Cooperation Framework Agreement (ECFA) is a bilateral trade agreement between Taiwan and China. If relations continue to deteriorate, China could terminate the ECFA to economically pressure Taiwan. However, the growth of Taiwan's semiconductor industry has weakened this leverage. In 2022, Taiwan's electronic exports to India grew 72% while exports to Southeast Asia increased 21% (Chiang, 2023), in contrast with a decline in electronic exports to China and Hong Kong that same year. This shift in electronic exports is an indication that Taiwan is successfully diversifying its economic partnerships and reducing Chinese economic impact.

If Taiwan can manage energy costs to sustain the global competitiveness of its semiconductor sector, it may be able to continue to dilute the leverage China has through the ECFA. However, this necessitates retaining global dominance in electronics, specifically chip manufacturing, by safeguarding low, reliable energy prices, which in turn requires stabilizing the currently unreliable supply of imported energy. The Taiwanese government has used Taipower's state-owned status to subsidize rising energy prices and protect economic development. As Taipower's losses mount, the government has been forced to loosen energy price controls, potentially harming economic performance (Jhou & Liao, 2013). Despite weakened ECFA authority, China could still restrict energy imports through its global network as economic

coercion or as retaliation to hostilities. Such actions would damage Taiwan's broader economy, but especially its industrial sector. If costly electricity reduces TSMC's global competitiveness, Taiwan will struggle to mitigate China's ECFA influence through diversifying electronic exports.

Implications as an export-oriented economy

Taiwan's economic strength rests on the export of goods and services, generating a $51.4B trade surplus. That surplus even increased by 7.4% in 2021, despite trade disruptions due to the COVID-19 pandemic (Ministry of Foreign Affairs…, 2024). One of the major recipients of Taiwan's exports is China. However, the trade volume between the two countries has decreased in recent years, a casualty of geopolitical tensions (Crotty, 2024). Economic factors also played a role in the decline, including rising Chinese labor salaries, decreased foreign direct investment from Taiwan, and competition from Chinese firms. Machinery and electronics account for $284.7B, or 64.2%, of Taiwan's total global exports, of which electronic integrated circuits represent almost 40% (Crotty, 2024).

There are several impediments to funding energy infrastructure in Taiwan. First, the US Department of State notes that market domination by state-owned enterprises in the utilities and energy sector, specifically Taipower's status as a state-owned monopoly, creates structural barriers to foreign direct investment flowing into, for example, offshore wind development (Bureau of Economic and Business Affairs, 2023). With Taipower's monopoly, there is less space for private or foreign companies; politicized pricing causes financial losses for the company. The second obstacle is installation cost. Currently, offshore wind farms as renewable energy sources must address installation and regulations that discourage investment. Installing 1 MW of offshore wind power in Taiwan costs approximately 2.5-fold more than in Europe and is more than in other East Asian countries, including Vietnam and South Korea. Uncertain financing attributable to construction delays also adds to the hesitation (Lu & Lui, 2023).

The third challenge for investment in the energy sector is regulatory hurdles. A major one is the statute that all offshore wind proposals off the Changhua coast must have approval from the Changhua Fisheries Association. Projects in this region represent 70% of all wind farms being built in Taiwan. The approval process adds significantly to costs. Preliminary calculations indicate that a wind farm covering 50 square kilometers requires a compensation of NT$60M upfront, with NT$0.018 per kWh generated for 20 years as an assistance payment. These "co-prosperity funds" are supposed to enable fisheries to coexist with offshore wind (Lu & Liu, 2023). The funds are designed to promote oyster farming, net cage aquaculture, and fishery training centers, all to compensate for the burden of fishing in a space shared with wind farms, to enable fisheries to transition to a model that enables coexistence of their communities with wind farms and ecological restoration and maintenance. The Fisheries Act means that some Taiwanese enjoy their fishing rights as their property in offshore areas (Tseng & Kao, 2022)—damage to fisheries is equivalent to damage to property. Wind farms contribute to lessening fishery output; thus, fisheries expect compensation for lost productivity. In addition, the government caps bidding rates, imposes a mandated share of locally sourced content, and places ceilings on size. Regulatory impediments were a factor cited by multinational energy company Ørsted for withdrawing in 2022 from bidding in stage 3 for an offshore wind project, claiming the regulations made the proposal uninvestable (Lu & Liu, 2023). Further, as Taiwan works to decrease dependence on Chinese supply chains, it has cut back on imports of low-cost Chinese solar products and wind turbines. Taiwan now seeks to import these from the European Union but at higher costs (Yin, 2024). The combination of Taipower's monopoly, high cost, and regulatory obstacles discourages international interest in Taiwan's offshore wind sector.

Taiwan's reliance on fossil fuels similarly threatens its economic competitiveness. Firms may relocate if Taiwan does not prioritize the transition to renewable energy. Suppliers to companies like Amazon, Meta, and Google increasingly must meet net-zero carbon requirements. These firms are major customers for Taiwanese chip manufacturers. A transition to renewables also would help it avoid the EU's Carbon Border Adjustment Mechanism (Hilton, 2024). If Taiwan does not transition to a higher share of renewables in electricity production, businesses will either pay these carbon taxes, thereby impeding their global competitiveness, or move to somewhere that enables them to satisfy net-zero limits.

Mitigation by supply diversification

Energy security for Taiwan requires both diversification of imports and development of domestic renewables. Oil from alternative sources, for example, Norway, Canada, and the US, could supplement imports from the Middle East and OPEC. However, this solution does not mitigate the risk of a Chinese

blockade. It only addresses the day-to-day uncertainties of overreliance on potentially compromised sources. Long-term security includes increasing domestically produced renewable energy to buffer the impact of a Chinese blockade. Expanding use of natural gas also offers security benefits by broadening suppliers and transport routes. Major natural gas reserves exist in Australia, Malaysia, and Indonesia (Lévêque et al., 2010). Japan and South Korea, both major importers of natural gas, have each widened import portfolios, which, however, leads to higher energy costs. Unfortunately, Taiwan cannot rely on stable funding flows into the natural gas sector. Global shifts toward low-carbon sources and sustainable energy lead to unpredictable demand and investment patterns (Lévêque et al., 2010).

Therefore, the best course of action combines increased domestic renewable or nuclear energy electricity production with greater import diversity during the transition period. Although supply diversification will increase electricity prices, TSMC can likely pass these increases to consumers (Subramanian, 2024). Since TSMC is responsible for such a large share of advanced chips and is so proficient at chip manufacturing, the company has significant pricing power. TSMC is the exclusive supplier of Nvidia's advanced artificial intelligence chips, with Nvidia accounting for 10% of the company's revenue in 2024. Thus, while diversification will increase costs, TSMC's market position allows it to manage these increases by raising prices without losing significant market share.

Challenges and opportunities in an energy supply shift

Taiwan must encourage investment in renewable and nuclear energy through both financial and regulatory reforms. Offshore wind represents the most viable renewable energy option to lower reliance on fossil fuel imports. Taiwan has a small, fixed land area, of which 79% is mountainous and unsuitable for solar plants, and the island's weather is frequently cloudy (Webster, 2023). In addition, rooftop solar is expensive and often unavailable, a consequence of competing uses of rooftop space, such as for recreational areas or gardening. Distributed solar electricity experiences low utilization rates and high installation costs, while utility-scale solar may be more efficient and cheaper to install but more vulnerable to cyberattacks (Webster, 2023). In contrast, the Taiwan Strait has the highest potential for wind power in the world close to high population centers (Hilton, 2024). Taiwan should also address public distrust of nuclear generation.

Reforming regulations—including constraints on size, locally sourced content mandates, and favoring local interest groups—would be a complementary set of actions along the same lines. Taiwan's Bureau of Energy places bidding caps to prevent any one company or player from becoming dominant in the production of offshore wind, but these capacity limits inhibit achieving economies of scale. This restriction dampens the appeal, but companies that do choose to invest often find ways to circumnavigate the caps. For economies of scale advantages, firms jointly develop larger wind farms (Foxwell, 2022). Another reason developers consider joint projects is a 60% localization requirement. This large, mandated share of locally sourced content increases costs, and investments are not viable unless the projects are larger. For example, a standard type of foundation for offshore wind turbines, a jacket foundation, is approximately twice as much when produced domestically compared to one produced in South Korea (Foxwell, 2022). Taiwan should lower the required percentage of domestic production to decrease costs. Lifting the caps on bids would enable companies to capture economies of scale and reduce operating expenses that ultimately are passed on to electricity consumers. So too, Taiwan should diminish the role of the Changhua Fisheries Association, reigning in what companies must pay upfront.

These regulatory reforms carry risks regarding the Chinese. If Chinese firms gain significant stakes in energy projects, Taiwan exposes its energy sector to Chinese leverage. If tensions rise, China may use this advantage for retaliation or to threaten Taiwan's energy stability. However, Taiwan already has a security review mechanism, in which Chinese firms undergo more rigorous scrutiny than other firms when investing in Taiwan and its infrastructure (Hsieh & Chen, 2024). Current regulatory barriers increase the price of offshore wind projects, hindering renewable energy proposals. Offshore wind projects do not have to be as expensive as they are; Taiwan must decide whether to prioritize domestic interests, such as the fisheries association and domestic content manufacturers, or energy security and industrial competitiveness internationally.

A major concern regarding relying on wind and solar is scalability. By contrast, nuclear energy can provide large-scale clean, carbon-free electricity to meet the needs of companies like TSMC aiming to decrease their carbon footprint. Nuclear can provide low-cost, reliable energy while promoting overall security by reducing import dependence (Nuclear Energy Institute, 2024). Bill Gates in the US

is building an advanced nuclear reactor in Wyoming, reflective of the positive outlook for nuclear energy (McDermott, 2024). South Korea too has reversed its policy to phase out nuclear power and broke ground on two new reactors in 2024 (World Nuclear News, 2024). These nuclear buildouts reflect the favorable economics of nuclear energy and a global nuclear renaissance. Nuclear power is cost-competitive with other forms of electricity generation, such as coal and natural gas, and operating costs for nuclear power are less than for intermittent renewables (World Nuclear Association, 2023). The greatest monetary drawback for nuclear power is the capital needed for nuclear power plants. Yet Taiwan has five nuclear reactors that are not in use, which will moderate the new capital required for integrating nuclear electricity into the energy mix.

Another policy ripe for reform involves caps on foreign ownership. Foreign investment is limited to 50% in nuclear power plants, with the remaining share owned by Taipower (Hilton, 2024). However, Taipower's debt is growing. Private investors hesitate to finance nuclear proposals if a partner is broke and in debt. Permitting nuclear projects with greater foreign ownership shares would encourage private engagement (Hilton, 2024). In 2017, Taiwan's total operational nuclear capacity was 5052 million watts of electric capacity but fell to only 938 million watts of electric capacity in 2024 (World Nuclear Association, 2024a). The shutting down of five of the six existing nuclear reactors resulted in slower economic growth, higher pollution and carbon dioxide emissions, and increased electricity prices (World Nuclear Association, 2023). Because lack of domestic ability to handle nuclear waste was a principal reason for shutting down reactors, Taiwan now has reprocessing procedures to export nuclear waste and is considering repurposing used fuel pools (World Nuclear Association, 2024a).

Overreliance on either nuclear or wind sources presents vulnerabilities: Offshore wind power requires exposed undersea cables to carry the electricity to the island, while nuclear power involves nontrivial probabilities of earthquake damage (Hilton, 2024). Both these solutions include risks, will take significant time to implement, and expose Taiwan to more Chinese interest. Oil supply diversification provides a less-than-ideal solution too. A complete phase-out of oil is not feasible due to the dependencies of the transportation sector and requirements for nonenergy purposes.

A three-pronged approach provides a solution: encouraging offshore wind development, reestablishing a nuclear energy program, and diversifying nonrenewable imports. This balanced approach distributes risk while capitalizing on the benefits of each solution.

Conclusion

To counter Chinese influence and preserve independence, Taiwan must take a comprehensive look at its energy security. Increasing its domestically produced clean energy along with building out a greener energy grid for domestic firms can help maintain export competitiveness. Revamping regulatory and financial approaches to wind energy projects would encourage investment and accelerate wind energy. Taiwan should relax capacity limits, reduce localization requirements, minimize local authority, and offer financial incentives for companies to fund offshore wind. Driven by its status as an economic and technological hub, Taiwan can attract international interest in developing the necessary offshore wind infrastructure.

Taiwan must reevaluate its stance on nuclear energy to ensure meeting growing industrial demand. The implications of a complete nuclear phase-out must be thoroughly assessed, as meeting both growing demand and renewable energy goals would be difficult without nuclear power. Taiwan must capitalize on the inexpensive and abundant source of clean power of nuclear energy, especially considering the existing infrastructure that would limit capital investment. Taiwan should postpone its nuclear phase-out and reintegrate its existing nuclear plants.

In parallel, Taiwan must manage its nonrenewable imports through expanded oil trade agreements with Canada and other countries to ensure the island is not overly reliant on countries easily swayed by China and OPEC. Taiwan should also seek to import its natural gas from a greater number of countries so that no one country or region has too great an effect on supply. These import diversifications will, aside from a blockade, temper the impact of disruptions and international interests, including but not limited to China's One China agenda. This three-pronged approach will allow Taiwan to manage the vulnerability to China that its high energy import creates while also providing domestic firms with clean energy.

Increasing domestically produced renewable and nuclear energy will reduce Taiwan's geopolitical vulnerabilities and strengthen its economic position. Taiwan does not need to produce 100% of its energy via domestic renewables to enhance energy security. If Taiwan can propagate renewable energy at the rate of its increase in consumption, it can begin to stabilize its energy sector and diminish risks from its high energy imports.

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