



## **Lessons Learned from Taiwan: The Economic, Political, and Social Consequences of Phasing Out Nuclear Energy in Korea**

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Taiwan's policy of moving away from nuclear power has led to both direct and indirect economic issues and was a significant factor in precipitating the recent August 15th blackout, which resulted in severe social disruption and damage to the political credibility of the current government. For South Korea, where the future of nuclear power in the country's energy mix is presently being debated, the recent developments in Taiwan are a glimpse into the negative consequences of phasing out nuclear energy; measures to reduce nuclear generation would derail any economic revitalization efforts by reducing the affordability, quality, and reliability of electric power, as well as greatly increase the probability of disruptive outages, ultimately endangering political capital and prospects for addressing unemployment and joblessness.

### August 15th Blackout

At 4:51 p.m. on Tuesday, August 15th, a [sudden power outage](#) on Taiwan affected nearly 7 million households; the incident initiated several rounds of rolling blackouts, and power was not restored until nearly four hours later. The direct cause of the outage was a failure to follow proper procedures in the replacement of equipment within the control room of a metering station of the Tatan Power Plant, disrupting the plant's natural gas supply.

In addition to disrupting power and water supply for millions of homes, the outage led to approximately [\\$3 million in damages](#) for companies in industrial parks and export processing zones, including firms engaged in semiconductor manufacturing--a process highly sensitive to electricity supply disruptions.

The blackout occurred despite previous signs and warnings regarding Taiwan's power reliability and supply issues. Just a week earlier, Taiwan's national utility, Taiwan Power Co., had issued alerts regarding its operating reserve margins, which fell to its [second-lowest point on record](#). In late July, [damages to a Ho-Ping Power Plant transmission tower](#) caused by a typhoon led to heightened concerns regarding power supply and rationing.

Taiwan's industrial firms and organizations have long been vocal about shortages in water and power supply that have a direct impact on their operations and activities. In particular, many of these entities have been outspoken in advocating for a reversal of the current administration's nuclear phase-out policies, arguing that restarting idled/suspended nuclear units could provide the reliable power that Taiwan sorely needs. For instance, the chairman of the Chinese

National Association of Industry and Commerce has advocated for [reinstating the Lungmen Nuclear Power Plant](#), the construction of which has been halted as a result of politically-motivated legal and regulatory delays.

#### The Aftermath and Economic Costs of the Incident

The economic costs of the August 15th blackout will likely be far greater than just the figures reflecting lost economic activity. Although many industrial and technology firms reported little to no impact from the incident, concerns about power reliability in Taiwan will only grow following the outage. Ultimately, such worries may threaten to [derail the growing influx of foreign investment into the technology sector](#), a bright spot for the island's economy. If international investors are concerned about power supply in Taiwan, they will be reluctant to continue pouring capital into Taiwanese industry, especially given the prominence of high-tech manufacturing, including semiconductor production--processes that are highly dependent upon reliable, uninterrupted power and are extremely sensitive to electricity supply disruptions.

The political costs have arguably been clearer. The blackout prompted a public apology from the Taiwanese president, whose credibility and approval rating were damaged from the incident. Furthermore, Taiwan's Minister of Economic Affairs [announced his resignation](#) immediately following his own public apology on the day of the blackout.

#### Calls for Review of Taiwan's Nuclear Energy Policies

The August blackout has not only reinforced domestic voices urging a reevaluation of the Taiwanese government's anti-nuclear stance, but it has also prompted international observers to call for a review of Taiwan's nuclear phase-out policies. Measures to replace nuclear with other generation sources will be costly and increase the price of electricity--highly problematic for an economy sorely in need of momentum amidst growing global economic uncertainty.

According to experts, the outage underscored Taiwan's relative lack of generation assets and reserve capacity--an issue that could be addressed if mothballed nuclear units were put into operation. Kerry Anne Shanks of Singapore-based Wood Mackenzie Ltd. argued that [difficulties in the commissioning of gas-fired units has highlighted the importance of nuclear](#): "There are now appeals for a review of the nuclear phase-out policy. The government remains committed to a nuclear-free Taiwan by 2025, but this stance will depend on whether the power system can survive the summer." Joseph Jacobelli, an analyst at Bloomberg Intelligence, stated that "[t]he (Taiwanese) government may be forced to [reconsider its anti-nuclear stance](#)."

#### Lessons for Korea

There are obvious parallels between Taiwan and Korea--both are densely populated electricity islands devoid of energy resources with advanced industrial economies that depend upon reliable supplies of power--that make Taiwan's recent blackout all the more salient for Korea. Energy scarcity is a common challenge for both nations; the problem is so acute that neither Taiwan nor Korea can afford to be too discriminate with their energy sources. The U.S., even in its newfound energy abundance, has advocated for an [all-of-the-above energy strategy](#) in recent years. Renewable energy must absolutely play a part in the energy mixes of both countries, but there are inherent limitations to the contribution of renewables. A recent [peer reviewed paper](#) cast serious doubt upon the feasibility of high penetrations of renewable energy, which, while possible in theory, will be difficult and costly to achieve without further technological advances. Moreover, very high renewables penetrations may ultimately affect the stability, reliability, and resiliency of the electric grid; as highlighted by the [August 2017 DOE report on electricity markets and reliability](#) and the [continued operation of nuclear reactors in Texas in spite of Hurricane Harvey](#), nuclear power is enormously vital for the dependability and resilience of the power system in case of "high risk events," whether extreme weather phenomena or, in the case of Taiwan, human error.

The Taiwanese case also highlights Korea's relative lack of renewable energy potential. Both Taiwan and Korea have acute land availability issues, and in Taiwan, there have been obstacles in achieving wind energy targets as a result of NIMBY (not in my backyard) issues. Such issues will certainly emerge in South Korea, a country with limited land resources and one of the highest population densities in the world. As in Taiwan, acquiring the necessary territory to site vast solar and wind farms to replace the energy produced at centralized generation assets such as coal and nuclear would be a formidable challenge.

Like Taiwan, Korea also faces its own array of economic issues, and increased electricity costs would serve no positive purpose. If the country transitions from nuclear and coal towards renewables and natural gas, the [cost of electric power will increase](#). Energy is a basic input for all economic activities and high-priced electric power will negatively impact all individuals and entities--not just major industrial operations and technology companies, but every consumer of electricity. The effect of high energy prices on Korea will be especially severe given the nature of its export-oriented, advanced industrial economy and its status as one of the most high-tech, digitally-connected societies in the world.

Perhaps in parallel with concerns in Taiwan that foreign investment may be diverted elsewhere if power reliability issues continue, there are also worries in Korea that higher labor and energy input costs will push companies, both large corporations and smaller businesses, to [move their operations abroad](#)--a development that would be absolutely disastrous for efforts to reduce unemployment in Korea. Increased energy costs would not serve as a progressive tax and merely affect large conglomerates, as some may perceive, but would act as an impediment for the entire country's economic prospects.

Even if economic stagnation is not immediately perceptible, a major blackout would likely erase any goodwill the Korean government has engendered--a disruption on par with what occurred in Taiwan would almost certainly jeopardize the [high approval ratings](#) the current administration enjoys. Yet, there seems to be little recognition by Korean policymakers that the warning signs that existed in Taiwan before the August outage may also be present in Korea--[reductions in the electricity reserve rate](#) may eventually result in dangerously slim operating reserve margins, a situation that existed before (and proved to be a foreshadowing of) the Taiwanese blackout. Instead of building sufficient capacity to act as a buffer against any possible power outages, the government instead appears to be opting for more controversial measures, such as instituting a [power management plan](#) through which it can order companies to temporarily reduce energy consumption.

The lessons from Taiwan must be heeded in Korea, and the Korean government must recognize that its energy plans, regardless of intention, imperil its own political capital and the economic futures of its most devoted constituents and supporters.

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