MALAYSIA'S NUCLEAR AMBITION:
FROM HESITATION TO REGIONAL LEADERSHIP

Opinion

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Malaysia was once at the forefront of nuclear science in Southeast Asia. Having achieved the first criticality of its research reactor in 1982 in Agensi Nuklear Malaysia, Bangi, Malaysia was off to an excellent start. Yet, despite early scientific progress, the ambitions for nuclear power were never fully realized.

Due to public tumult that fueled political hesitation, the idea that was first explored during the 1980s and a renewed push in the late 2000s was eventually shelved in 2018 [1]. While nuclear energy is indispensable to achieving the Sustainable Development Goals, Malaysia continues to lag behind due to the absence of a coherent policy and institutional framework. With reflection on Malaysia's position as the Chair of ASEAN in 2025 it is time to reignite that ambition. Nuclear power is not merely an energy option, but a strategic imperative; one that could position Malaysia as the regional leader in Southeast Asia's pursuit of energy sovereignty and technological self-reliance.

Since 2015, the GDP per capita in south east asia increased by more than 30% in tandem with the energy and electricity demand skyrocketing by more than 35% and 60% respectively [2]. This growth trajectory falls in line with the dire need of clean, reliable, and sustainable energy sources that align with the global net-zero aspirations [2], as the region's electricity generation remains over 80% dependent on coal, oil, and gas [3]. While commendable progress being put into renewable energy investments, particularly in solar and wind, they still face one big challenge; they do not produce electricity consistently Historically with intermittent renewables, power generation often drops when demand peaks. Excessive mismatch between supply and demand of electricity will cause grid instability, leading to voltage fluctuations, unexpected power cuts, or even large scale blackouts.

Renewables still remain an essential part of the energy transition, however, to truly cut carbon emissions without risking blackouts, a dense and stable energy source that can run all day long is needed. Only a few technologies can do so - namely hydropower, geothermal, and nuclear. Amongst them, nuclear stands out as the most reliable, with the highest output, the smallest waste volume and the lowest land footprint. If Southeast Asia is genuinely committed to achieving its net-zero goals, then

adopting nuclear power is not an option, but a necessity.

Many are unaware that Southeast Asia has a rich history in nuclear science. The establishment of the Treaty of Southeast Asia Nuclear-Weapon-Free Zone (SEANWFZ) in 1995 prohibits nuclear-weapons development among member states, but crucially, recognizes the right of ASEAN states to pursue the peaceful use of nuclear energy [4]. In response to the oil crises and rising energy demand in the 1970s, several Southeast Asian nations took initiative by developing robust nuclear programs to explore the potential of adopting nuclear power in their energy mix. That in turn, led to the construction of seven research reactors across the region specifically in Malaysia, Indonesia, Thailand, Vietnam, and Philippines [5, 6]. The Philippines took the ambition a step further with the construction of The Bataan Nuclear Power plant in 1984, a fully completed 620 MW facility that, despite never being commissioned due to political upheaval, remains a testament to regional readiness [7].

As of 2025, all five countries have expressed renewed interest in advancing their nuclear power programs. The Philippines and Vietnam have moved into what the International Atomic Energy Agency (IAEA) calls the "preparatory phase", the stage where governments finalize regulations, conduct site assessments, and prepare for reactor construction [8, 9]. Malaysia on the other hand, remains in the "consideration phase": the focus is still on assessing national readiness and policy frameworks after the shutdown of Malaysia Nuclear Power Corporation in 2018, which frankly, left years of groundwork and expertise to go to waste [8, 10].

November 2024, then-Economy Minister Rafizi Ramli publicly announced that nuclear energy was included as part of RMK13, thus signaling the government's acknowledgement of nuclear power as a viable instrument to achieve the National Energy Transition Roadmap, NETR's aspiration [11].

In July 2025 amidst government's seriousness in going nuclear, MyPOWER Corporation was designated as the Nuclear Energy Programme Implementing Organization (NEPIO) to spearhead the nuclear energy program. However after a year navigating through the bureaucratic labyrinth, the progress remains sluggish. Without deliberate acceleration, Malaysia risks falling behind regional peers that are actively pursuing nuclear energy.

To realize the potential of nuclear power in a timely manner, Malaysia must prioritize several pivotal areas. First, the development of a robust regulatory framework must advance hand in hand with the strategic investment of human capital. Talents should be sent abroad to learn from established nuclear nations and internalize the best regulatory and operational practices that can be locally adapted in Malaysia. Simultaneously, Malaysia needs to quickly establish a dedicated implementing agency responsible for technical evaluations. This agency should be responsible for reactor site selection, vendor engagements, and front end engineering design studies, not only to streamline decision making but also to ensure technical readiness. Furthermore, Malaysia should explore innovative financing mechanisms such as public and private partnerships to finance the capital cost of a nuclear power plant.

Equally important, public trust and social acceptance remain the cornerstone of any successful nuclear program. Decades of hesitation have shown that technology alone cannot move the needle; sustained public education is essential to dispel misconceptions and earn long term confidence.

Malaysia has repeatedly proven that bold ambitions when met with determination can yield extraordinary outcomes.

Decades ago when many doubted the ability to manage a national oil company, PETRONAS grew from humble beginnings into a global energy giant. The path was not easy, but Malaysia dared to invest, learn, and master the technology. The same can be said for other national successes, from the semiconductor industry which transformed Penang into the "Silicon Valley of the East", to Proton which marked the first step into automotive manufacturing and built a foundation for local engineering talent [12].

The lesson becomes crystal clear; Malaysia thrives when there is a combined vision with persistence. Nuclear power, much like these past ventures, requires courage and long-term commitment. True progress demands more than just purchasing reactors or signing international agreements, it requires cultivating knowledge transfer, embedding technical mastery within institutions, and nurturing a new generation of experts who will one day export Malaysian expertise abroad.

If Malaysia once believed that oil production,

high-tech exports, and world class infrastructure were impossible until it was achieved, then the nuclear dream deserves the same conviction. Three essential ingredients are needed; clear policy direction, coordinated execution, and unwavering public trust. Once these are secured, nuclear energy can become not just a component of an energy mix, but a symbol of Malaysia's return to scientific and technological leadership in Southeast Asia.

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