CHANDLER
MORI HAMADA

Newsletter

June 12, 2025

# Thailand's Road to Nuclear Energy



Tip-apa Limvichai
Partner
tip-apa.l@morihamada.com


Monsicha Pongrujikorn
Counsel
monsicha.p@morihamada.com


Adamas Onglaor
Associate
adamas.o@morihamada.com


## Introduction

Earlier this year, Thailand entered into a nuclear treaty with the United States, making it the fifth ASEAN member state to be party to a 123 Agreement. This followed on from extensive updates to Thailand's nuclear energy regulatory framework last year, when 15 new Ministerial Regulations were introduced and 36 announcements were made.

Although Thailand built its first research reactor in 1962, since then, the development of nuclear energy in Thailand has been slow, due to social factors and nuclear disasters elsewhere such as Chernobyl and Fukushima. Having included nuclear power in its Power Development Plan (PDP) in 2007, Thailand removed nuclear from its PDP 2018 but then re-introduced up to 600MW of nuclear energy using Small Modular Reactors (SMR) in the new draft PDP 2024.

## Nuclear Energy and SMR

Nuclear power is classified as a clean (low carbon) and stable source of energy as it produces the lowest greenhouse gas emissions per kWh of electricity compared to other technologies. As a result, major technology companies such as Microsoft and Google are increasingly turning to nuclear power as a reliable, low-carbon source of electricity for their data centres. This shift toward nuclear energy has the potential to be transformative in the global effort to combat climate change, offering a pathway to decarbonize one of the fastest-growing sectors of electricity demand.

Nuclear fission is the process by which the nucleus of an atom is split into two or more smaller nuclei, releasing a significant amount of energy, and this is the technology currently used in nuclear power plants. Older generation and modern large nuclear reactors have capacities ranging from between 500 to 1600 MW, or even larger for advanced reactors. SMRs typically have capacities ranging from 50 to 300 MW and they use nuclear fission technology that offers several advantages over traditional Nuclear Power Projects (NPPs), including scalability, lower initial costs, and enhanced safety features. However, they also face challenges such as higher per-unit costs, regulatory hurdles, and the need for market acceptance. Traditional NPPs benefit from economies of scale and proven technology but come with high capital costs, lengthy construction times, and safety concerns.

In contrast, nuclear fusion involves combining two light atomic nuclei to form a heavier nucleus, a reaction that powers the sun and promises abundant energy with minimal radioactive waste, although it remains technologically challenging for commercial use – with experts predicting large-scale commercialisation will be achieved closer to 2050. Thailand built its first small research tokamak (Thailand Tokamak-1) in collaboration with the Institute of Plasma Physics of the Chinese Academy of Sciences, and this officially commenced operation in July 2023. A tokamak is a device which uses magnetic plasma technology to produce controlled thermonuclear fusion power.

## Regulatory Framework Update

In 2024, 15 ministerial regulations and 34 notifications were issued under the Nuclear Power for Peace Act B.E. 2559 relating to: collateral and licensing; management of radioactive materials; transportation and import/export; reporting and documentation; nuclear facilities and operations; safety and standards, among other areas. These reforms were in line with recommendations from the Nuclear for Peace Committee and could signal that Thailand is laying the groundwork for the potential utilization of nuclear power in the future. From a human resources perspective, many Thai higher-education institutions have started offering courses, scholarships, and exchange programs with international organisations, such as Nuclear Safety Research Association of Japan and the International Atomic Energy Agency to grow capabilities of Thai scientists in this area.

On 17 January 2024, the Office of Atoms for Peace (OAP) collaborated with the Office of the Energy Regulatory Commission and entered into an Agreement on the Regulation of Nuclear Facilities Using Nuclear Reactors for Power Generation between the Nuclear Energy for Peace Committee and the Energy Regulatory Commission, B.E. 2567 (2024). Under this agreement, the OAP will be responsible for nuclear safety, nuclear security, and nuclear safeguards. Permits will be issued by the OAP pursuant to the Nuclear Power for Peace Act B.E. 2559 for the following activities:

1) Utilizing land for conducting nuclear business
2) Constructing nuclear operational facilities;
3) Operating a nuclear facility;
4) Ceasing to operate a nuclear facility; and

Extensions, suspensions, and revocations of permits 1)- 4) above.

The ERC will be responsible for energy security and grid connectivity, as well as issuing licenses and permits in accordance with the Energy Industry Act.

## International Treaties

The 123 Agreement that Thailand signed with the USA establishes the legal framework for peaceful nuclear cooperation, including the transfer of nuclear material, equipment, and technology, while ensuring compliance with non-proliferation obligations and international safeguards. The Office of Higher Education Commission signed the 123 Agreement on behalf of the government, although input was invited from the Ministry of Energy and Ministry of Foreign Affairs during the review process. Due to the vast potential of nuclear energy, any information on nuclear technology constitutes highly sensitive classified information. Without government-to-government level cooperation, it was not previously possible to exchange detailed technical data necessary to initiate business development or to begin building the required local capabilities. Thus, the 123 Agreement kickstarts the exchange of information between the United States and Thailand and introduces rights of exclusivity and oversight by the United States on matters related to nuclear activities within Thailand.

Among other ASEAN member states, Vietnam has set up a steering committee for the construction of its first NPP (Ninh Thuan nuclear power project) by 2030; Indonesia plans to build and operate NPPs using SMRs and floating SMRs by 2032; the Philippines plans to have its first NPP operational by 2032; Singapore's government has shown interest in developing a nuclear power program in the long term and it entered into a 123 Agreement prior to Thailand in 2024; and Myanmar and Laos PDR have not shown any interest in nuclear power.

Given the potential scale of a nuclear emergency or disaster, both internal and regional buy-in will be required. The Chernobyl disaster in 1986 impacted more than 20,000 sq km of Europe, particularly in agriculture and the Fukushima accident in 2011 displaced more than 160,000 people, with continued economic impact on the country of Japan and its seafood exports for years to come.

## What might a Nuclear Power Project (NPP) look like?

The International Atomic Energy Agency published guidance for the development and structuring of NPPs which outlines the many ways to structure an NPP in terms of contracting and ownership approaches. NPP projects, due to their high-risk nature and historical background, had in the past been developed as part of military projects, and even civilian nuclear power projects are public-private partnerships with heavy reliance and involvement of government stakeholders. In some countries, projects may be owned and operated by the same entity; others may include an owner and a separate more experienced NPP operator; or a joint venture between the owner and an NPP operator which is from the same country as that of the nuclear technology vendor.

An NPP has a long construction period that could take 7-10 years, and the operational duration of the project could take up to 60 years; however, SMR is a much newer technology on a smaller scale, thus the timeline may not be as long. Financing NPP projects may, therefore, require a different approach to other types of power projects. Three types of financing models have been used:

1. sovereign-based model: led by the state enterprise and financed out of the government budget
2. corporate-based model: following a debt plus equity model whereby the bank or the bond holder would have a claim against the corporation's assets and cashflow.
3. project-based model: using project financing, which involves limited recourse financing that is repaid from the expected income stream of the project.

Like other types of projects, a typical NPP project company may have a suite of contracts and relevant stakeholders including: (i) Project Specific Intergovernmental Agreement between the host nation and the technology provider; (ii) Engineering, Procurement, Construction Contracts with the nuclear technology provider; (iii) Operations, Maintenance and Support with the operator; (iv) Power Purchase Agreement with the power purchaser; (v) Fuel Supply Agreement for radioactive fuels; (vi) Waste Management/ Spent Fuel Organisation Agreement; and (vii) agreements governing the relationship between the project sponsors and shareholders. Unlike other types of power projects, the risks in connection with an NPP often fall on the taxpayers, power consumers, or both.

## Analysis and Implications

In many countries, nuclear energy contributes to decarbonisation and lower energy price goals, although the feasibility of nuclear energy projects relies heavily on the collaboration of multiple stakeholders and consideration of key factors. The 123 Agreement opens doors for nuclear industry players, including technology providers, experienced contractors, and advisors, to enter the newly opened and now-regulated long-term market in Thailand. EPC contractors can benefit for 7-10 years, while operators may see benefits for up to 60 years. The NPP ecosystem involves many stakeholders, and where there is a lack of local capabilities, reliance on imports could significantly impact project costs. Public perception and acceptance remain major factors, and strong government commitment is crucial for both the initial and long-term success of nuclear energy projects.

Analysis shows that while nuclear energy offers significant potential for supporting Thailand's energy transition and achieving its decarbonization goals, the way to achieve this is complex. It requires careful management of stakeholder interests, investment in local capabilities, and transparent communication to build public trust. The fallout from past nuclear incidents underscores the importance of robust safety measures and regulatory oversight.

In conclusion, Thailand's entry into the nuclear energy sector, facilitated by the 123 Agreement, presents both opportunities and challenges. Success will depend on strategic planning, stakeholder collaboration, and sustained government support to ensure that nuclear power can contribute safely and effectively to the nation's energy future. If these elements are in place, nuclear energy can play a vital role in meeting the country's growing energy needs, supporting the expansion of energy-intensive sectors such as AI and data centres, and contributing meaningfully to national and global decarbonization efforts.

Chandler Mori Hamada will closely monitor these legal developments and keep you informed of any updates. If you have any questions in relation to the issues raised in this newsletter, please contact the authors listed above.

## References


- ASEAN Center for Energy, ASEAN Energy Booklet Volume 2: Nuclear Energy Development in ASEAN (9 August 2024) https://aseanenergy.org/publications/asean-energy-booklet-volume-2-nuclear-energy-development-in-asean/ accessed 16 May 2025.
- Channel News Asia, 'Commentary: Singapore's Nuclear Energy Future – Small Reactors and Safety Concerns' https://www.channelnewsasia.com/commentary/singapore-nuclear-energy-small-reactor-smr-safety-floating-4997551 accessed 16 May 2025.
- INTERNATIONAL ATOMIC ENERGY AGENCY, Management of Nuclear Power Plant Projects, IAEA Nuclear Energy Series No. NG-T-1.6, IAEA, Vienna (2020)
- Office of the Spokesperson, 'United States and Thailand Sign Civil Nuclear Cooperation Agreement' (2025) https://2021-2025.state.gov/office-of-the-spokesperson/releases/2025/01/united-states-and-thailand-sign-civil-nuclear-cooperation-agreement 16 May 2025.
- Royal Gazette, 'Agreement on the Regulation of Nuclear Facilities Using Nuclear Reactors for Power Generation between the Nuclear Energy for Peace Committee and the Energy Regulatory Commission, B.E. 2567 (2024)', Volume 141, Special Part 319 Ng (21 November 2024).
- The New York Times, 'Amazon, Google and Microsoft Bet on Nuclear Power to Run the Cloud' https://www.nytimes.com/2024/10/16/business/energy-environment/amazon-google-microsoft-nuclear-energy.html accessed 20 May 2025.