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#04



Why and How Nuclear Energy Can Be Included in the ASEAN Taxonomy

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POLICY BRIEF

Highlights

1. Nuclear energy as a strategic option faces practical challenges for deployment in ASEAN .
2. Inclusion of nuclear energy in the green taxonomy is an enabling step for financing regional nuclear projects.
3. A regulatory framework for licensing nuclear projects should be established in consideration with sustainability criteria.
4. An ASEAN regional taxonomy framework is crucial to guide the national sustainable financing regulation and safe implementation of nuclear assets.

Summary

Financing nuclear power projects remains a key consideration despite official announcement of national nuclear position among several Southeast Asian economies. A regionally driven framework on nuclear green taxonomy can facilitate nationally appropriate implementation of sustainable financing regulations and policy regime to accelerate regional nuclear energy development.

What's the issue?

There is a growing demand for low carbon electricity driven by the push for energy transition towards net-zero. ASEAN (acronym for Association of Southeast Asian Nations) Member States (AMS) acknowledges the need to decarbonise its energy mix and is exploring the potential of nuclear power generation. As of 2020, AMS have installed 285 GW of power capacity, with coal and natural gas contributing to almost two-thirds at 31.4 per cent and 30.9 per cent respectively¹. ASEAN will continue its energy demand growth, around 3 times of 2020 level by 2050. ASEAN's total final energy consumption per capita is expected to

increase 35 per cent by 2030 and two-fold by 2050 under the Planned Energy Scenario as presented in a study by the International Renewable Energy Agency², reaching OECD (acronym for Organization for Economic Cooperation and Development) energy consumption levels. Therefore, the need for emissions-free power is crucial. Without significant effort, fossil fuels will remain the largest component of the energy mix and the region could become a net importer of gas by 2025 and net importer of coal by 2039. The International Energy Agency recognizes that nuclear power will need to play a major role in the energy transition and in its net-

¹ Kresnawan, Muhammad Rizki, and Beni Suryadi. 2022. *ASEAN Energy in 2022: Outlook Report*. Jakarta: ASEAN Centre for Energy.

² International Renewable Energy Agency and ASEAN Centre for Energy. 2022. *Renewable Energy Outlook for ASEAN: Towards a Regional Energy Transition (2nd Edition)*. Abu Dhabi and Jakarta.

zero emissions pathway, nuclear power should double between 2020 and 2050³. Prominent ASEAN nations, such as Indonesia, Thailand, the Philippines, and Vietnam, are exploring the possibility of developing small modular reactors (SMRs) to advance decarbonization and bolster energy security. Nonetheless, progress is uncertain, primarily due to financing challenges associated with supporting nuclear power plant development in regions where public and investor sentiment may be cautious.

The recognition of nuclear as green, could enable its adoption as an economically viable low-carbon energy source. Acknowledging nuclear power as a green activity would convey to investors that such projects are in alignment with sustainability objectives, thus fostering investment and expanding financing opportunities. This approach could help surmount some of the financial obstacles and uncertainties currently faced by countries intending to construct SMRs, ultimately expediting the shift towards low-carbon energy and enhancing energy security in the region.

SMRs and floating nuclear power plants (FNPPs) provide an opportunity for different financing models of those of traditional civil nuclear power plants, but they could fall short in meeting the growing demand for clean energy. FNPP offers unique advantages as they can be stationed in remote areas and repositioned to other locations. If AMS decide to deploy SMRs and FNPPs, they must address the regulatory framework and infrastructure challenges. The absence of a regulatory framework presents a challenge for early adopters. Likewise, requirements for

the design and construction of nuclear facilities, and guidelines for their operation, maintenance, and decommissioning are necessary to ensure nuclear safety.

Without action to provide more support for nuclear power, efforts towards energy transition will be harder and more costly in ASEAN. Negative perceptions about nuclear power must also be addressed to strengthen the public acceptance. Studies have shown that nuclear power, when assessing number of fatalities per kWh produced, is one of the safest energy sources second only to solar⁴. The International Atomic Energy Agency (IAEA) has defined a set of nuclear energy safety requirements which reflect an international consensus to ensure the protection of people and the environment.

³ International Energy Agency. 2022. Nuclear power can play a major role in enabling secure transitions to low emissions energy systems. Paris.

⁴ Ritchie, Hannah. "What Are the Safest and Cleanest Sources of Energy?" Our World in Data. Global Change Data Lab, February 10, 2020. <https://ourworldindata.org/safest-sources-of-energy>.

Why is this important?

As renewables energy, primarily wind and solar power gain importance to meet climate change mitigation goals, nuclear power becomes increasingly crucial, given its high energy content and lower electricity generation costs from long-lasting nuclear fuel in power stations. This is particularly relevant for ASEAN, as rising fuel prices, carbon neutrality, and economic recovery present conflicting objectives that cannot be addressed by renewables alone. Nuclear energy produces significantly fewer greenhouse gas emissions than coal and about half of those from wind or solar, yet it isn't always considered a green energy source⁵. Thus, no incentive or financing schemes include nuclear energy.

The European Union (EU) taxonomy is a key component of the EU's sustainable finance agenda that drives green investments to accelerate decarbonization efforts. As part of its "Green Deal" The EU aims to mobilize some €1 trillion in public and private investment over 10 years to help it achieve its ambitious climate targets. The inclusion of nuclear energy in the existing EU taxonomy presents an opportunity for project developers to access additional funding sources, thereby easing financial burdens associated with the development of nuclear power projects.

In its Complementary Climate Delegated Act, the European Commission includes certain nuclear and gas activities in the "transitional" category. These are activities that cannot yet be replaced by technologically and economically feasible low-carbon alternatives but do contribute to climate change mitigation while also being subject to strict conditions, without crowding out investment in renewables. This regulatory

development in the EU can serve as a valuable reference point for ASEAN as the region seeks to define its own sustainable finance taxonomy. The EU Joint Research Centre (JRC) provides independent and evidence-based knowledge that works closely with various organisations within the EU and internationally. In 2020, JRC was tasked to carry out a "more extensive technical work on the DNSH (acronym for Do No Significant Harm) aspects of nuclear energy". The JRC's analyses did not reveal any science-based evidence that nuclear energy does more harm to human health or to the environment than other electricity production technologies already included in the Taxonomy as activities supporting climate change mitigation.

Key nuclear aspects of the EU Green Taxonomy are low carbon emissions, waste management, safety and security, and complementarity to renewables. This is to ensure that nuclear energy is developed and used in a safe, responsible, and sustainable manner, while contributing to the fight against climate change. There is opportunity to extend the EU rules into ASEAN context to drive sustainable financing development for nuclear power activities.

In the context of ASEAN, most AMS have signed and ratified conventions and agreements related to nuclear safety to comply with international standard and regulation. Regulatory framework has also been established in accordance with IAEA safety guidelines. Indonesia, Malaysia, the Philippines, Thailand and Vietnam have established dedicated a regulatory body to license, inspect, monitor and regulate

⁵ Cometto, Marco, Paolo Contri, Zeynep Gulerce, Brianna Lazerwitz, Bertrand Magne, Mario Tot, Hal Turton, and Alik Van Heek. 2022. *Climate Change and Nuclear Power 2022: Securing Clean Energy for Climate Resilience*. Vienna: International Atomic Energy Agency.

nuclear-related activities⁶. Indonesia already has an independent regulatory body which is separate from the promoting agency, while the regulatory body and promoting agency in other member states share the same organizational structure.

In November 2021, the ASEAN Taxonomy Board launched the ASEAN Sustainable Finance Taxonomy as a guideline for evaluating the sustainability impact of regional projects and activities. The multi-tier taxonomy encompasses four environmental objectives and highlights DNSH principle. Following stakeholder consultations, Version 2 was released in March 2023, which highlighted that coal phase-out activities may be classified as either green or amber. Alongside the ASEAN Taxonomy, four member states have developed national

taxonomies with varying scope and approach, yet they generally align with the regional framework. Following this development, it is crucial to consider that the existing ASEAN Taxonomy does not include nuclear energy and other potential options, which may warrant further exploration and analysis as the taxonomy evolves.

Nevertheless, the existing ASEAN Sustainable Finance Taxonomy provides a robust foundation for future iterations to potentially consider nuclear energy as a green activity, further enhancing the region's sustainable finance landscape.

What should the policymakers do?

1. Reassess the recently launched ASEAN Sustainable Finance Taxonomy Version 2 and explore the inclusion of nuclear energy in the subsequent update

The recent launch of the ASEAN Sustainable Finance Taxonomy Version 2 presents an opportunity for policymakers to reassess its scope and consider the integration of nuclear energy in the upcoming version. Incorporating nuclear energy within the taxonomy could serve as a crucial component in expediting decarbonization efforts and enhancing energy security in the region, considering that some AMS, such as Indonesia, Vietnam, the Philippines, and Thailand, have already established some form of political commitment to adopt nuclear power as part of their climate change mitigation strategy. Integrating nuclear

energy into the ASEAN Taxonomy would enable the region to better support individual member countries in customizing the taxonomy to fit their national needs. Additionally, recognizing nuclear energy within the taxonomy could deter greenwashing among investors and stimulate more robust public-private partnerships, encouraging financial backing in an area presently lacking support. Ultimately, this would aid the transition to a low-carbon energy future in the ASEAN region.

2. Establish sustainability standards and assessment framework for nuclear energy

The current ASEAN Sustainable Finance Taxonomy Version 2 has established a comprehensive technical screening criteria for six Focus Sectors and three Enabling Sectors, using a tiered traffic-light system.

⁶ ASEAN Centre for Energy. 2018. *Study on the Nuclear Legal & Regulatory Framework in ASEAN*. Jakarta.

Carbon capture, utilisation and storage is recognized as one of the enabling sectors. A notable aspect of Version 2 is the acknowledgement of coal phase-out as an Activity, subject to more rigorous sustainability standards. Policymakers may wish to consider encouraging the review committee for the technical screening criteria to explore the potential inclusion of nuclear energy as a recognized Activity under the taxonomy, supported by stringent sustainability standards and an assessment framework. The EU taxonomy, which incorporates nuclear energy as a green activity accompanied by strict assessment standards, can serve as a valuable reference point. This integration could accelerate decarbonization pathways and establish credible, verifiable, and transparent criteria for nuclear energy, ensuring its alignment with regional sustainability goals and standards.

3. Address any controversial matter arising from the inclusion of nuclear in the ASEAN taxonomy

Gaining public support for adopting nuclear energy is essential. Policymakers and relevant stakeholders should engage in open dialogue, education, and communication to foster public trust in the safety and sustainability of nuclear energy. Given the mixed public acceptance of nuclear power and regional differences, governments and private sectors must collaborate to develop a compelling case that emphasizes the advantages of nuclear energy as a low-carbon energy source for meeting climate change mitigation targets while acknowledging the risks and challenges involved. Demonstrating that nuclear energy can contribute to regional decarbonization goals, coupled with a strong commitment to stringent sustainability standards, safety, waste management, and public engagement, is crucial for building public trust.

4. Regional organisations and think tanks should play an active role in science- and evidence-based policy analysis supporting the ASEAN regional taxonomy.

Political Regional organizations and think tanks can explore partnerships with countries experienced in nuclear power generation to leverage their expertise and knowledge, while being mindful of the social and cultural context of the region. For example, by conducting thorough research, developing data-driven insights, and sharing best practices from other regions. These entities can assist policymakers in making informed decisions and shaping effective strategies for the integration and implementation of sustainable finance initiatives. Their expertise is valuable for identifying key opportunities and challenges, fostering cross-border collaboration, and promoting a harmonized approach to sustainability goals across the region. Active engagement of regional organizations and think tanks will ultimately enhance the existing ASEAN taxonomy, ensuring its ongoing relevance and effectiveness in driving sustainable finance and investments, and shedding light on additional activities to achieve climate change mitigation targets.

Biography

Dr Victor Nian is a Co-Founder and Chief Executive Officer of the Centre for Strategic Energy and Resources. His expertise is in energy, sustainability, and net-zero policy and strategies. He is one of the go-to-persons in nuclear energy and the hydrogen economy in Southeast Asia. Dr Nian holds a PhD in Mechanical Engineering and BEng (Hons) in Electrical Engineering with a Minor in Management of Technology, all from the National University of Singapore.



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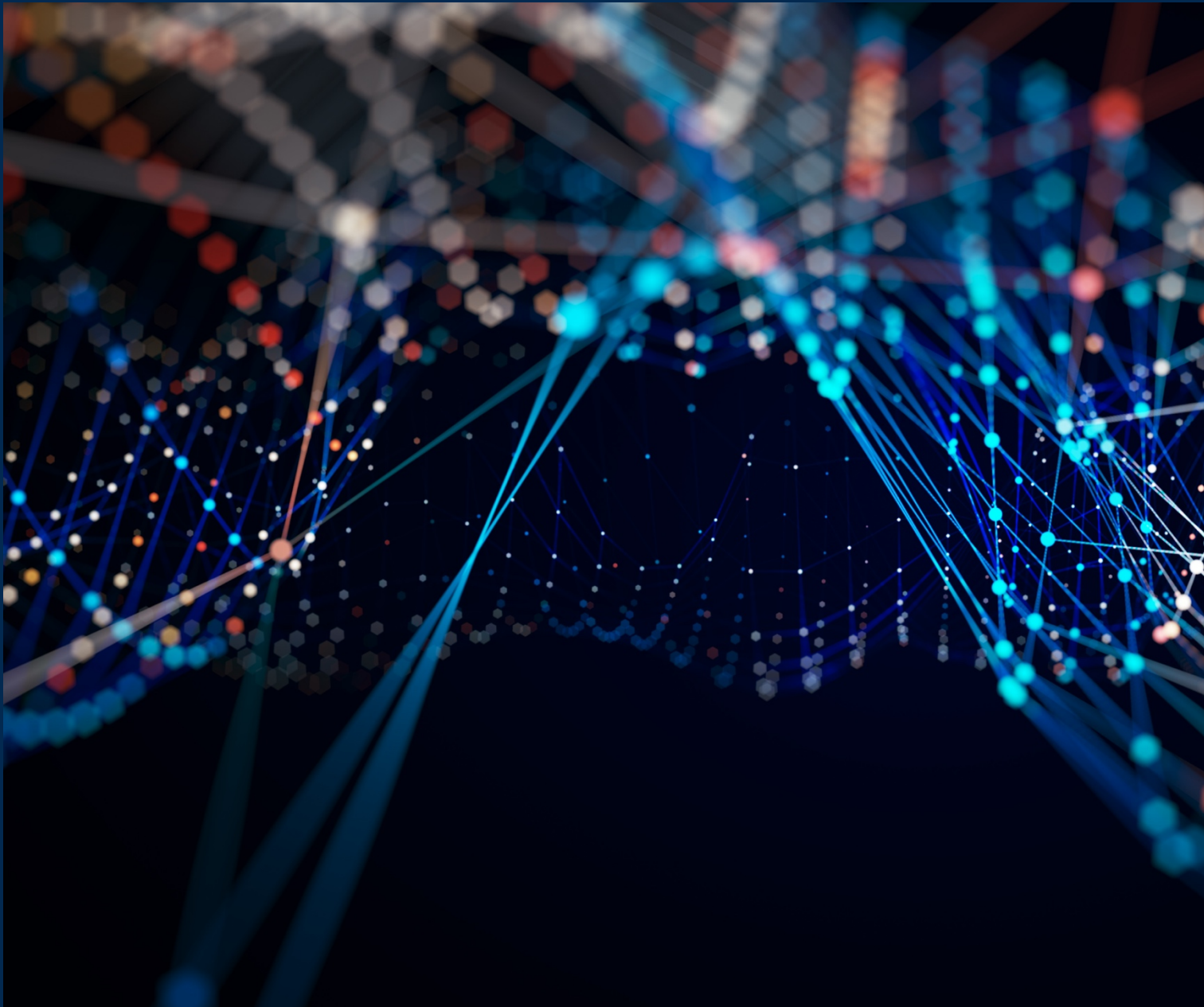
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Erik Dagorn is Nuclear Projects Director at Bureau Veritas. His expertise covers independent testing, inspection and certification services for the nuclear industry. He has also been involved in key projects directly supporting nuclear regulatory bodies. He holds an engineering degree in Chemical Engineering from the French Ecole Centrale de Lille.



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