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The Future of Small Modular Reactors: Implications for Nuclear Governance

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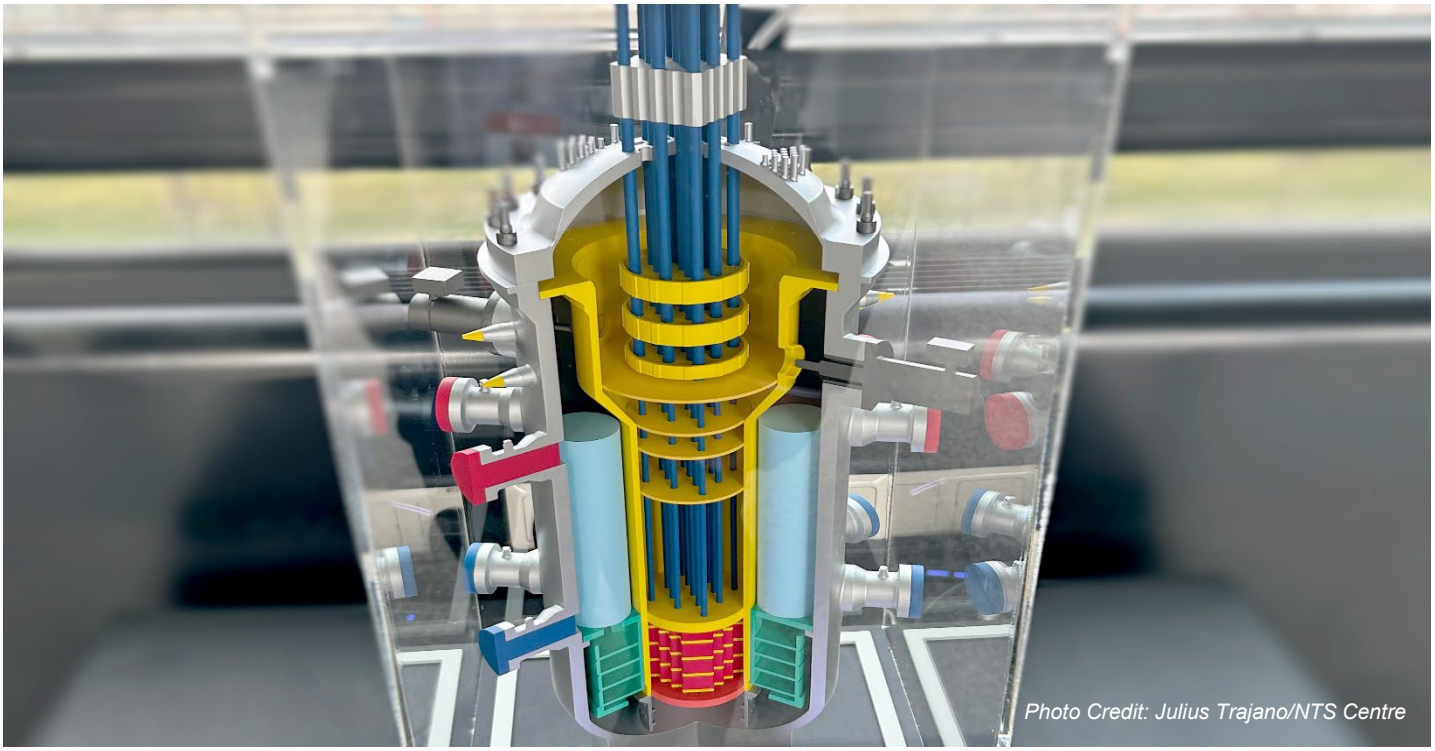

Introduction

Small Modular Reactors (SMRs) are classified by the International Atomic Energy Agency (IAEA) as advanced reactors that produce electricity of up to 300MW. An SMR is a fraction of the size of a conventional nuclear power reactor and will produce carbon-free electricity. It is usually factory-assembled and transported as a unit to an isolated location that has limited grid capacity. Given its modular nature, subsequent SMR units can be added on when the grid capacity expands.[1]

The world's first commercial SMR is built on a floating platform and is located just off Russia's Arctic coast. According to the IAEA, other commercial land-based SMRs in the pipeline will be deployed in Argentina, Canada, China, Russia, South Korea, and the United States (US). Several Southeast Asian countries, such as Indonesia, the Philippines and Thailand, have recently been offered by the US to be part of the "Foundational Infrastructure for the Responsible Use of SMR Technology (FIRST) Program", a capacity building programme for countries interested in US SMR technology.[2]

[1] International Atomic Energy Agency, *Lessons learned in regulating small modular reactors* (Vienna: International Atomic Energy Agency, 2022).
[2] US Embassy in Indonesia, United States, Indonesia Announce Partnership on Small Modular Reactor Nuclear Clean Energy, 18 March 2023, https://id.usembassy.gov/united-states-indonesia-announce-partnership-on-small-modular-reactor-nuclear-clean-energy/;

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The development of SMR technology offers an alternative source of clean energy for Southeast Asian countries where energy demand continues to grow rapidly, with an expected regional Gross Domestic Product (GDP) of US$20 trillion by 2040. The region was forecasted to be a net importer of fossil fuels, with coal contribution to installed power capacity projected to almost double up to 163 GW by 2040. More imported dirty energy sources will heighten energy security risks and greenhouse gas emissions in the region.[3] As such, drastic actions are needed to enlarge the share of alternative zero-carbon energy sources, given that fossil fuels currently generate 80% of ASEAN's electricity. Complementing nuclear energy with renewables is a solution for the region to have reliable and carbon-free energy supply.[4]

The Asia-Pacific region has seen renewed interest in nuclear power. In particular, Northeast Asian countries are involved in business and technological investments in developing SMR projects while Southeast Asian countries, as possible commercial users, are exploring SMRs as a future clean energy source. However, in preparation for future SMR deployment, it is worthwhile to review ongoing efforts to enhance nuclear governance frameworks. Key challenges to the introduction of SMRs and floating reactors in ASEAN revolve around regulatory frameworks, operation and maintenance, spent fuel management, and the 3S (Safety, Security, Safeguards) of nuclear governance among others.[5]

This NTS Insight provides an overview of SMR projects in Northeast Asia and recent developments in Southeast Asia. It examines the critical roles of global nuclear safety and security regimes, national regulatory bodies, and nuclear vendors in ensuring a more robust nuclear governance that incorporates the 3S concept associated with advanced SMRs.

An Overview of Ongoing and Potential SMR Projects in Asia

The Philippines

On 1 May 2023 in Washington DC, the meeting between the US President Joe Biden and President of the Philippines Ferdinand Bongbong Marcos Jr led to the announcement of bilateral negotiations on a civilian nuclear energy cooperation agreement ("123 agreement") to boost their cooperation on clean energy and non-proliferation priorities with the use of SMR technology. Prior to procuring US nuclear technology, it is a prerequisite to enter into a 123 Agreement with the US, which primarily focuses on non-proliferation principles, in order for the US to share its nuclear technology with other nations.

Marcos Jr has previously expressed his desire to include nuclear energy in the country's power mix and his administration is keen on importing SMRs. Among the potential suppliers being considered are US nuclear companies. Marcos Jr had already met executives of NuScale Power during his visits to the US. NuScale pledges to partner with a Philippines conglomerate to build SMRs in the Philippines by 2031.[6] The US will provide capacity building support through

[3] Frank Umbach, ASEAN's energy transition: Risks and opportunities, *Fossil Fuels,* 11 Aug 2021, https://www.gisreportsonline.com/r/energy-southeast-asia/.
[4] ASEAN Centre for Energy, *5th ASEAN Energy Outlook* (Jakarta: ACE, 2021).
[5] Jor Shan Choi, RSIS Seminar on "A 3S (Safety, Security, Safeguards) Assessment for Small Modular Reactors in Deployment or under Construction," Singapore, 31 May 2022.
[6] Marlon Ramos, US firm plans to build small nuclear power plants in PH, *Philippine Daily Inquirer,* 3 May 2023, https://globalnation.inquirer.net/214302/us-firm-plans-to-build-small-nuclear-power-plants-in-ph.

the FIRST Program, which will help the Philippines develop a national civilian nuclear engineering workforce, with a special focus on SMR technology.[7]

Thailand

During the US Vice President Kamala Harris' visit to Thailand in November 2022, she launched a new clean energy partnership with Thailand to build capacity for the secure and safe deployment of advanced nuclear reactor technologies under the US' FIRST Program. This partnership builds on almost 50 years of US-Thailand civilian nuclear cooperation. Just like in the Philippines, the FIRST program will work with experts from government, academia, industry, and national laboratories to explore options to advance Thailand's goal of Net Zero Emissions by 2065 through the deployment of SMRs under the highest standards of safety, security and safeguards.[8]

Indonesia

The US and Indonesia signed a memorandum of agreement in March 2023 to help the latter develop its nuclear energy programme, particularly in its interest in deploying SMRs to meet energy security and climate goals. Under the agreement, the PLN Indonesia Power, one of the largest power generation companies in Southeast Asia, has been awarded by the US Trade and Development Agency with capacity building assistance in evaluating the technical and economic viability of Indonesia's first SMR plant to be located in West Kalimantan. In addition, the US assistance worth US$ 1 million is designed to capacitate Indonesian authorities in essential nuclear governance skills relevant to SMR deployment, including support in areas such as workforce development, stakeholder engagement, preliminary social and environmental impact assessment, site identification, regulations, and licensing.[9]

Myanmar

Myanmar's military leaders are moving forward with a plan to adopt Russian-built SMRs as the country grapples with an energy cliff caused by dwindling output from natural gas reserves. Its Ministry of Electric Power and Rosatom outlined a joint feasibility study on SMRs, under a Memorandum of Understanding (MOU) signed in November 2022 in Sochi, Russia.[10]

South Korea

US-owned SMR companies have been creating business partnerships with South Korean conglomerates. Since 2013, Hyundai has been working with Ultra Safe Nuclear Corporation to design and develop a micro-modular reactor, a specific type of SMR. Hyundai also has a comprehensive agreement with Holtec International in developing a SMR prototype.[11]

South Korean conglomerates, namely Doosan, Samsung and GS Energy have invested their respective expertise in energy development, nuclear construction experience, and power plant operation into NuScale's SMR project. In April 2022, NuScale inked an MOU with these three firms to explore the deployment of NuScale's VOYGR™ SMR to Asia. With the MOU, NuScale and its Korean strategic investors will jointly explore and plan the deployment of VOYGR SMRs in determined locations, including in the Asia-Pacific.[12]

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[7] The White House, FACT SHEET: Investing in the Special Friendship and Alliance Between the United States and the Philippines, 1 May 2023, https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/01/fact-sheet-investing-in-the-special-friendship-and-alliance-between-the-united-states-and-the-philippines/.

[8] US Embassy in Thailand, FACT SHEET: Vice President Harris Announces New Initiatives to Strengthen U.S.-Thailand Alliance and to Support Mekong Sub-Region, 20 November 2022, https://th.usembassy.gov/fact-sheet-vice-president-harris-announces-new-initiatives-to-strengthen-u-s-thailand-alliance-and-to-support-mekong-sub-region/.

[9] US Embassy in Indonesia, United States, Indonesia Announce Partnership on Small Modular Reactor Nuclear Clean Energy, 18 March 2023, https://id.usembassy.gov/united-states-indonesia-announce-partnership-on-small-modular-reactor-nuclear-clean-energy/.

[10] Myanmar News Agency, MoEP Union Minister discusses projects with Russian State Atomic Energy Corporation Rosatom, *Global Light of Myanmar*, 9 December 2022, https://www.gnlm.com.mm/moep-union-minister-discusses-projects-with-russian-state-atomic-energy-corporation-rosatom/.

[11] Kim So-hyun, Hyundai Engineering expands nuclear power plant business, *Korea Herald*, 31 May 2022, https://www.koreaherald.com/view.php?ud=20220531000254x.

[12] NuScale, NuScale Power Signs Memorandum of Understanding with GS Energy, Doosan, and Samsung to Explore Small Modular Reactor Deployment, 26 April 2022, https://www.nuscalepower.com/en/news/press-releases/2022/nuscale-signs-mou-with-gs-energy-doosan-and-samsung-to-explore-small-modular-reactor-deployment.

Japan

Mitsubishi Heavy Industries completed in 2020 a conceptual design for an integrated small reactor, called as SRZ-1200, an advanced pressurised water reactor. It is designed for power generation for small grids (300MW class) and for ship-mounted mobile and emergency power supplies for remote islands (30 MW class). The SRZ-1200 remains a conceptual model and is far behind other SMR models being developed elsewhere, Mitsubishi, in collaboration with four local power utility firms, is moving ahead with its plans to develop and commercialise advanced reactors—small enough to be delivered on trucks—by mid-2030s.[13] The broadening partnership between NuScale and Japanese nuclear companies in developing SMRs would be a key strategy for Japan to gain access to other SMR technologies. As Japan currently has no advanced SMR models in operation, several Japanese industrial and power conglomerates opted to invest in and collaborate with US-owned NuScale Power.[14]

China

China's nuclear state-owned enterprises, in collaboration with university research institutes, are actively manufacturing SMRs, including deployment domestically. Unlike Japan and South Korea, China has solely relied on the SMR projects of its own nuclear power companies. In September 2021, after 9 years of research, technological development and construction, Beijing-based state-owned power utility China Huaneng Group Company (CHGC) started up the demonstration of the high temperature gas cooled reactor (HTGR). While it is not yet in the stage of commercial operations, CHGC claimed the successful demonstration of the SMR nuclear plant at the Shidaowan site in Shandong, China in December 2022. It had reached its initial full power with stable operation, which CHGC described it as "laying the foundation for future commercial operation".[15]

Another state-owned enterprise, China General Nuclear Power Group (CGN), is currently constructing an ambitious "floating nuclear reactor" — ACPR50S — that has been tested through the company's simulation facility to check its resilience against hurricanes and extreme weather events. The 60-megawatt station will be China's first floating reactor and is being built to power oil rigs and islands off the east coast in the Bohai Sea. This floating reactor is the result of a Chinese plan drawn in 2016, that envisions commercialising a new generation of at least 20 small and portable nuclear reactors primarily deployed to China's islands and remote regions, particularly in Bohai Sea and the South China Sea. The ACPR50S will be China's first fleet of floating reactors.[16]

Given these developments of SMRs in the Asia-Pacific, it is therefore crucial to review current nuclear governance regimes, encompassing nuclear safety, security and non-proliferation. Asia-Pacific countries that are parties to key safety, security and non-proliferation treaties/conventions, including ASEAN member states, are inclined to collaborate to implement strong governance in deploying nuclear power plants. They have a collective interest in ensuring nuclear safety and security with respect to any advanced reactor to be deployed in the region in the years to come. States considering future acquisition of nuclear power would be advised to continue to undertake comprehensive preparations, in terms of both governance and technical capacity.[17]

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[13] Mitsubishi Heavy looking to commercialize nuclear microreactors by end of next decade; 500kW output, Green Car Congress, 19 April 2022, https://www.greencarcongress.com/2022/04/20220419-mhimicro.html.

[14] Does Japan offer rich pickings for SMRs?, *Nuclear Engineering International*, 12 August 2021, https://www.neimagazine.com/features/featuredoes-japan-offer-rich-pickings-for-smrs-8991006/.

[15] World Nuclear News, China's demonstration HTR-PM reaches full power, 9 December 2022, https://www.world-nuclear-news.org/Articles/China-s-demonstration-HTR-PM-reaches-full-power.

[16] Stephen Chen, China's first floating nuclear reactor may withstand once-in-10,000-years weather event, engineers say, South China Morning Post, 14 December 2021, https://www.scmp.com/news/china/science/article/3159566/chinas-first-floating-nuclear-reactor-may-withstand-once-10000.

[17] Trevor Findlay, Asia Pacific Regional Nuclear Governance: Fragmented, patchy yet fixable?,, *Nuclear Governance in the Asia Pacific*, Eds. Mely Caballero-Anthony and Julius Cesar Trajano (London: Routledge, 2022).

The Role of Global Nuclear Safety and Security Regimes

It is necessary to revisit existing global nuclear conventions, treaties and non-binding safety and security standards to assess if they adequately cover SMRs. At the core of the nuclear safety regime is the 1994 Convention on Nuclear Safety (CNS) which requires state parties to regularly examine their nuclear safety practices and undergo international peer review of those practices. It encompasses the safety of nuclear installations such as nuclear power plants, radiation safety, safety in radioactive waste management and safety in the transport of radioactive material.[18] While the CNS can cover land-based SMRs, it is uncertain, however, if the Convention can be applied to marine-based or floating SMRs. The scope of the Convention states that "a nuclear installation means any land-based civil nuclear power plant under Contracting Parties' jurisdiction…." (Article 2). A 2022 preliminary legal study published by the European Commission argues that floating SMRs are excluded from the CNS as well as SMRs used for military and research purposes. [19]

However, other experts would point out that CNS, even in its current form, may not need to be revised as it can still be applied to floating/marine SMRs. An SMR will use transportable modules that are completed in factories and transported for direct 'plug and play' installation on site. Once a floating SMR, in close proximity to the coast, is plugged into the land-based power grid, it will be considered as a land-based facility covered by CNS.[20] For instance, the OECD NEA suggests that nuclear governance experts can have an in-depth legal study on flexible interpretation of the terms "land-based or nuclear power plant" used in CNS and whether they can be interpreted to also include SMRs, floating SMRs, or floating nuclear power plant anchored at shore.[21] Furthermore, the review meetings of state parties to CNS can also serve as an authoritative platform to seek pathways to incorporate SMR's new features in the CNS.

For nuclear security, the CPPNM and its Amendment (A/CPPNM) is the main global convention that mandates state parties to constantly strengthen security measures in nuclear facilities. A/CPPNM defines "nuclear facility as a facility (including associated buildings and equipment) in which nuclear material is produced, processed, used, handled, stored or disposed of, if damage to or interference with such facility could lead to the release of significant amounts of radiation or radioactive material (para. 3.d);[22] The definition is evidently broad enough and can therefore cover both land-based and marine-based SMRs. A study by the Joint Research Centre of the European Commission concludes that the A/CPPNM remains applicable to SMRs and their nuclear material wherever it is produced, used, handled, stored or disposed of. As this convention also further criminalises the sabotage of nuclear facilities and materials, it will henceforth include the criminalisation of security threats and even cyber attacks to an SMR.[23]

The Convention on Spent Fuel and Radioactive Waste Management will also need to be reviewed, as the treaty is not technology neutral. The waste generated from a uranium-based reactor will be different from a thorium-based reactor and therefore the specifics of spent fuel management will be different.

In terms of Emergency Preparedness, safety guidelines and zones for evacuation will also need to be reviewed with the understanding that SMRs can potentially adopt a smaller evacuation zone. The challenge is, yet again, the harmonisation of guidelines and safety standards for SMR as current standards are applicable to only the conventional Light Water Reactors.

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[18] IAEA, *Safety Glossary: Terminology Used in Nuclear Safety and Radiation Protection 2018 Edition* (Vienna: IAEA, 2018).
[19] Alexandra Van Kalleveen, *Applicability of the international nuclear legal framework to small modular reactors (SMRs),* EUR 30992 EN (Luxembourg: Publications Office of the European Union, 2022).
[20] Discussions at the CSCAP Nuclear Energy Experts Group Meeting, San Francisco, CA, US, 27-29 September 2022.
[21] Van Kalleveen, *Applicability.*
[22] Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment, 8 July 2005
[23] Van Kalleveen, *Applicability.*

A recently issued report by the IAEA on the applicability of its safety standards to SMRs claims that like conventional large NPPs, SMRs should also be tightly governed, i.e., regulated, to attain the goal of protecting people and the environment from radiation and minimizing the possibility of accidents.[24] Meeting this objective can be realised through demonstrating compliance with the IAEA safety standards which include technical aspects of nuclear governance, such as regulation, siting, design, construction, commissioning, operation, decommissioning, release from regulatory control, nuclear fuel cycle, transport of radioactive and nuclear materials, radiation protection, emergency preparedness, safety-security-safeguards interface, and radioactive waste management.

The report also found that IAEA safety standards, particularly these critical technical areas, are generally applicable to SMRs. However, some of the IAEA safety guidelines and recommendations particularly those that directly refer to conventional, land-based NPPs could be modified, or new requirements and recommendations could be added to improve the applicability of the safety standards to a wide range of SMRs.[25]

Another perspective is that most of the global nuclear safety and security treaties and IAEA safety standards and security guidance do not address SMRs in a consistent fashion. Nevertheless, SMRs are not excluded from its scope, given that these conventions have been ratified long before the first successful design of SMR was completed. In general, global nuclear conventions can be progressively adapted to encompass new technologies and respond to legal challenges they create. However, specific regulatory guidelines for licensing of SMRs and its future deployment and operation will still have to be drafted and instituted.

The report claims that current nuclear safety standards do not cover potential accident scenarios and hazards that would only be relevant to SMRs.[26] In this regard, while existing global safety and security regimes may seem to be adequate for now, the harmonisation of regulatory guidelines and requirements wherever possible, as well as the possible harmonisation of regulatory licensing and approval processes should be achieved for the safe and secure deployment of SMRs.[27]

There are presently more than 70 SMR designs under development in 18 countries, some of which are in the Asia-Pacific with advanced reactor technologies. A majority of these designs have yet to be licensed. Regulatory agencies, together with the nuclear industry, have yet to be completely familiarised with the adoption or development of new approaches for SMR modular construction. In this regard, large-scale deployment and operationalisation of SMRs in time to contribute to a low-carbon future remains a challenging nuclear governance issue, particularly amending national regulatory frameworks and harmonisation of regulatory and industrial approaches. This harmonisation entails greater regulatory collaboration to institutionalise common positions among nuclear regulatory bodies on policy and technical issues covering high levels of nuclear safety, security and safeguards for SMRs. At the same time, it also involves concerted efforts from the nuclear industry and even competing SMR developers to establish more standardized industrial approaches for design, manufacturing, construction, commissioning and operation of SMRs as well as generic user requirements and criteria.[28]

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[24] International Atomic Energy Agency, *Safety Report on Applicability of Safety Standards to Non-Water-Cooled Reactors and Small Modular Reactors*, Safety Reports Series Number No. 123 [IAEA Preprint] (Vienna: IAEA, 2022).
[25] Ibid.
[26] Ibid.
[27] Jeffrey Donovan and Paula Calle Vives, Accelerating SMR Deployment: New IAEA Initiative on Regulatory and Industrial Harmonization, IAEA, 1 April 2022, https://www.iaea.org/newscenter/news/accelerating-smr-deployment-new-iaea-initiative-on-regulatory-and-industrial-harmonization.
[28] Ibid.

Role of the National Regulatory Bodies

There is indeed a need to comprehensively address the extremely limited regulatory and operating experiences of states considering SMR technologies and designs. A global forum of nuclear regulatory agencies, the SMR Regulators' Forum, serves as a key platform for regulators to jointly identify and resolve common safety issues that may undermine regulatory oversight associated with SMRs. Created in 2015, the Forum facilitates comprehensive SMR-focused discussions among regulators, encompassing recommendations for revisions to IAEA documents, information to assist regulators strengthen regulatory frameworks, common regulatory challenges and recommended pathways, and potential amendments to international codes and standards on nuclear safety and security.[29] Membership to the forum was originally limited to the IAEA Member States who participated in the initial sessions of this forum: Canada, China, Finland, France, Republic of Korea, Russian Federation and United States. The United Kingdom joined in 2018 for Phase 2. South Africa joined in March 2021 while Japan joined in March 2022.[30] Saudi Arabia withdrew from the forum in 2022. After its pilot phase, the forum is currently opened to all Member States of the IAEA who can make significant contribution and outcome to the development of IAEA safety and security guidelines for SMRs.[31] There is no Southeast Asian country in the SMR Forum as the region does not have a nuclear power plant.

Regulatory bodies are expected to evaluate whether their national legal framework for nuclear installations will be adequate for the projects involving SMRs. Regulatory bodies have agreed that existing regulations and guidance applicable to nuclear reactors can also be applied to SMRs, if their nuclear legal framework is generally technology-neutral, which means there is no specific type of reactor technology mentioned. However, for particular situations where modifications are necessary because regulations and guidance are not as technology neutral as they need to be, those policy reviews and subsequent legal reforms are expected to be implemented in advance of the SMR projects in their respective countries.[32]

In this regard, for countries in ASEAN with growing interest in SMRs and capacity building partnerships with potential SMR vendors and country-suppliers, it is an opportune time to review their existing legal and regulatory frameworks on nuclear safety and security and identify gaps or challenges to their existing regulations when these were used to develop the regulation of a specific technology type (e.g. Light Water Reactors) and a broad set of new generation of nuclear power reactors need to be considered. Furthermore, they should also consider officially joining the SMR Regulators' Forum and regularly participate in its activities given that membership to the forum is now open to all IAEA Member States who are able to meaningfully contribute to the work of the forum working groups.

Role of Nuclear Companies/SMR Vendors and Developers

The role of the nuclear business sector is crucial in the development of SMR technology within the Asia-Pacific region. As demonstrated in the partnerships (technological and investment deals) between SMR developers, power utilities and industrial conglomerates, (i) technology sharing and (ii) the availability of funding are the two indispensable factors for ensuring future commercial viability of SMR technology in the Asia-Pacific.

Private companies can also offer SMR-oriented feasibility studies and workshops to Southeast Asian countries. For instance, in May 2022, Power Engineering Consulting Joint Stock Company 2 (PECC2), a well-known Vietnamese engineering firm, partnered with Siemens Energy and Danish nuclear developer Seaborg Technologies to co-host an international SMR nuclear conference together with Vietnam Atomic Energy Institute (VINATOM) in Ho

[29] International Atomic Energy Agency, *Lessons Learned in Regulating Small Modular Reactors: Challenges, Resolutions and Insights* (Vienna: IAEA, 2022).
[30] SMR Regulators' Forum, Terms of Reference Small Modular Reactor (SMR) Regulators' Forum, August 2022, https://www.iaea.org/sites/default/files/22/08/smr_rf_tor_august_2022.pdf.
[31] The annual membership fee is 30000 to 40000 Euros for each Member State.
[32] Ibid.

Chi Minh.[33] In 2022, ROSATOM signed an agreement with Myanmar's Ministry of Electric Power on feasibility studies on Russia-Myanmar SMR Project.[34] In 2019, the Philippines' Department of Energy and Korea Hydro and Nuclear Power (KHNP) jointly conducted a Pre-Feasibility Study on the possibility of SMR deployment in Cagayan Economic Zone, a growing industrial enclave in northern Philippines.[35]

Apart from the techno-economic analyses as well as potential site selection evaluation, these feasibility studies can also include initial reviews of existing regulatory and legal frameworks in each of the Southeast Asian countries that are interested in SMRs. In this regard, feasibility studies offered by nuclear vendors can be used to identify current and future gaps in national nuclear safety and security regimes in the region.

Furthermore, whether they offer land-based SMRs or floating reactors, potential manufacturers will have to work closely with relevant government agencies and power utilities in the region to develop appropriate emergency response measures for 'what if' scenarios.

Conclusion

It is important that all relevant actors, from governments, regulators to nuclear vendors and power utilities adopt the 3S (Safety, Security and Safeguards) approach when considering nuclear energy, including SMRs. There is a need to revisit existing global nuclear conventions and IAEA safety standards and security guidance to assess whether SMRs are adequately covered. Several studies have pointed out that the spirit of existing conventions can still be applied to SMRs even without amendments or new conventions while specific international standards and guidelines, that are not reactor technology-neutral, would be needed to consider unique specifications of SMRs.

Southeast Asia, with its coastal archipelagic geography, sees a high prospect of floating reactors operating in the region in the coming decades. A paradigm shift is needed to incorporate the flow of floating reactors transiting through the Southeast Asian region, because a mobile nuclear power station is no longer a localised issue. In this regard, Southeast Asian countries, especially those that have interest in possible utilisation of SMRs in the future, should take a proactive role in reviewing and if needed, reshaping, civilian nuclear governance.

[33] Baek Byung-yeul, Doosan, SK, Samsung rush to harness next-generation nuclear reactors, *The Korea Times*, 20 April 2022, https://www.koreatimes.co.kr/www/tech/2023/01/129_327617.html
[34] Acceleration to Myanmar, *ROSATOM Newsletter*, March 2023, https://rosatomnewsletter.com/2023/03/22/acceleration-to-myanmar/.
[35] Department of Energy of the Philippines, Nuclear Power Program, Chapter 10 in *Philippine Energy Plan 2018-2040* (Taguig City, Metro Manila: DOE, 2020).

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