



Key Findings

Workshop

on

Philippines Energy Landscape and Plans with Nuclear Power

Novotel Manila Araneta City

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The Pacific Forum, in cooperation with the Philippine Nuclear Research Institute, conducted a workshop on the Philippines' energy landscape and its plans for utilizing nuclear power in its planned transition to clean energy. Approximately 20 scholars and officials participated, all in their private capacity. The off-the-record discussions provided an opportunity to discuss key energy issues affecting countries in Southeast Asia and the prospects for utilizing emerging technologies related to nuclear power generation in the Philippines as Manila seeks ways to transition to clean energy as part of its commitment to "sustainable, stable, secure, sufficient, accessible and reasonably-priced energy." Key findings from this meeting include:

Due to rapid economic development, population growth, and urbanization, electricity demand in Southeast Asia has grown rapidly over the past two decades and will continue to grow exponentially in the coming decades. Electricity demand in the Philippines is expected to increase to 364 terawatt hours (TWh). Total demand in 2020 101.8 TWh. One of the major concerns in the Philippines has been the high cost of electricity, with the median cost equaling 10-15% of a family's monthly income.

Given the heavy reliance on natural gas, the Philippines faces a pending dilemma as the Malampaya gas fields in the West Philippine Sea are expected to be depleted completely as early as 2027 with little prospect for finding replacement reserves in the region. Current plans call for substituting natural gas imports as a partial solution to the dilemma. However, there is a lack of port and storage infrastructure to support such a transition.

There have been several initiatives to expand and improve the power grid in Southeast Asia, with most of the emphasis on the Mekong region of continental Southeast Asia and the Laos-Thailand-Vietnam-Malaysia-Singapore Power Integration Project. Challenges associated with undersea connections, geopolitics, and security have hampered connectivity between islands in maritime Southeast Asia. There are plans to connect the island of Palawan to Borneo as part of the project. Within the Philippines, there are generic plans for improved grid modernization and the promotion of smart grids, but no specific projects are in place for enhanced inter-island connectivity.

The Philippines National Renewable Energy Program Plan (2020-240) sets targets for renewable energy to provide 35% of total power generation mix by 2030 and 50% by 2040. Much of this capacity is expected to come from solar- and wind-based systems, which would require significant infrastructure investment, revision of leasing and permitting requirements, and transmission network enhancements.

While the Philippines participates in and supports the work of the ASEAN Energy Center, there is little expectation for the Center or ASEAN more broadly to provide any significant regional capacity building for the clean energy transition in the region. Specifically, the Philippines anticipates that it will continue to seek bilateral agreements to ensure access to fossil fuels and does not foresee any future for a regional energy market that would help make energy-related prices more transparent and stable.

Based on commitments made in 2015 Paris Climate Agreement (COP21) and subsequent pledges at the 2021 UN Climate Convention (COP26) countries in Southeast Asia have made commitments to reduce carbon emissions by increased reliance on clean energy. In April 2021, the Philippines committed to a projected greenhouse gas emissions reduction and avoidance of 75% by 2030 for the agricultural, wastes, industry, transport, and energy sectors. However, much of the commitment is based on the need for international assistance. At COP26, the Philippines consistently emphasized the need for climate financing support from developed countries. It also endorsed a statement to move away from coal energy, but it was the only Southeast Asian country not to call for its phase-out.

There is a growing acknowledgement by governments in Southeast Asia that nuclear energy should be considered seriously as an alternative clean energy source. Vietnam, Thailand, Philippines, Malaysia, Singapore, and Indonesia have taken action to incorporate a nuclear option in the energy planning process. The Philippines formally adopted its national position for a nuclear energy program in February 2022.

The Philippines is currently working to develop its nuclear power program roadmap based on the IAEA milestone approach in anticipation of an operational nuclear power plant by 2029. Current activities include the development of an integrated review and work plan. In the near future, it anticipates the establishment of a Nuclear Energy Program Implementation Organization (known as NEPIO), the creation of an independent nuclear regulatory commission, and the passage of a national nuclear law.

Successful integration of nuclear energy will require a firm commitment to nuclear safety, security, and safeguards, as well as transparency in national planning efforts. In anticipation of these requirements, the Philippine Nuclear Research Institute recently reactivated its research reactor, after 34 years of dormancy, to serve as a base for research and training of nuclear engineers and scientists as well as potential nuclear power plant operators.

Both the previous and current administrations have offered support for the potential restoration of the Bataan nuclear power plant, which was mothballed in 1986 before becoming operational. Despite claims made in the 1980s, recent studies have shown there are no earthquake fault lines or significant volcanic activity in the region where the Bataan plant is located.

While existing Philippine plans do not integrate nuclear into its power generation mix, nuclear and hydrogen are recognized as potential new sources for clean energy in Department of Energy (DOE) planning documents. A 2019 DOE survey indicated that 79% of Filipinos supported nuclear power as an energy source.

The trend toward small modular reactors (SMRs) is important for the Philippines because it reduces the initial facility cost, has a smaller footprint, and provides more siting flexibility. The introduction of smaller reactors also introduces the possibility of siting reactors in decommissioned coal-fired plants. One suggestion was to conduct a study to examine the economic and technical feasibility of repurposing coal-fired facilities for housing SMRs or even nuclear micro-reactors.

Small reactors especially the floating modules, are seen as especially attractive for providing a reliable power source for individual islands. Given that the Philippines has a large number of small islands, the prospect of utilizing Floating Nuclear Power Plants (FNPPs) is enticing as a potential solution to providing these islands with a safe and resilient energy source. However, to host FNPPs, the unique challenges associated with new regulations for safety, security, emergency preparedness and response, and IAEA safeguards would need to be resolved before serious economic and technical analyses can be done to determine the feasibility of such as option.

This document was prepared by David Santoro and Carl Baker. For more information, please contact David Santoro (david@pacforum.org), President & CEO of Pacific Forum. These preliminary findings provide a general summary of the discussion. This is not a consensus document, and the views expressed do not necessarily reflect the views of all participants.