

ASEAN: THE NEXT NUCLEAR POWERHOUSE?

How regional cooperation can aid the development of nuclear power in Southeast Asia

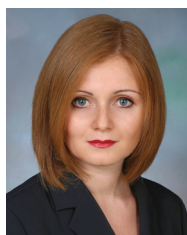
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In the 1960s, Japan imported from the United Kingdom a 160 MWe reactor, its first commercial nuclear power unit. By the end of the 1970s, the Tokyo Electric Power Company (TEPCO) had constructed the six-unit Fukushima I nuclear power plant and Japanese vendors had developed the capacity to design and construct light water reactors. Today, Japan has 53 operating reactors with two under construction and a dozen more planned. It is one of the largest nuclear operators in the world and is a leading exporter of nuclear technology.

South Korea soon followed suit, constructing 21 reactors since the late 1970s and developing domestic capacity that has recently resulted in a \$20 billion award to the Korea Electric Power Company consortium to construct and operate four APR-1000 units in the United Arab Emirates.

Even though China is a more recent entrant into the industry, it currently has the fastest growing commercial nuclear program in the world. China plans to expand its fleet of 13 reactors with 70-plus GWe of new nuclear capacity by 2020 and has even more ambitious future plans. China is also quickly becoming self-sufficient in nuclear reactor design and construction.

With Japan, South Korea and China as leaders, East Asia has proven to be fertile ground for the successful development of commercial nuclear power. Rapid economic growth, increasing energy demand and commitment to technological advancement has transformed these countries from newcomers only several decades ago to today's industry leaders.

Who will be the next Asian tiger in the global nuclear industry? The countries of the Association of Southeast Asian Nations (ASEAN) look like prime candidates. The majority of ASEAN's ten member countries have announced intentions to pursue commercial nuclear power. Vietnam is in the lead, having signed preliminary agreements with Russia and Japan to construct its first four units. Malaysia, Thailand and Indonesia are also in serious planning stages of new nuclear programs. Singapore is conducting a nuclear feasibility study, and the Philippines is considering rehabilitating its mothballed Bataan nuclear power plant.

ASEAN nations should consider regional cooperation as a vehicle to power the successful development of emerging nuclear energy programs. In other parts of the world, regional cooperation proved to be

vital to creating the infrastructure necessary to advance commercial nuclear power. Examples include the economic, legal and regulatory support provided by the European Atomic Energy Community (EURATOM) to its 27 European Union member nations and the feasibility and implementation studies of nuclear power programs conducted by the Gulf Cooperation Council. The Baltic States and Poland have formed a nuclear development initiative, and, most recently, the Presidents of Argentina and Brazil have discussed plans to jointly build and operate new nuclear reactors in their respective countries.

On February 18, ASEAN will convene for an inaugural meeting about nuclear energy cooperation in the region. This forum is the ideal place for countries to agree on several key areas of cooperation that will provide genuine support for each country's path of nuclear power.

Regional Safeguards

As parties to the Non-Proliferation Treaty (NPT), ASEAN countries considering nuclear power have entered into comprehensive safeguards agreements (CSAs) with the International Atomic Energy Agency (IAEA) for the application of safeguards to all of their peaceful nuclear activities. These countries have also signed, and some have implemented, the Additional Protocol to the CSAs, which grants the IAEA complementary inspection authority. Article III of the NPT allows for the safeguards obligations to be met by groups of

countries acting together. This is the case with Non-Nuclear Weapons States (NNWS) in EURATOM, which in 1973 concluded an agreement with the IAEA for the implementation of NPT safeguards.

The EURATOM framework allows for cost-effective sharing of resources and greater reliability through common information and reporting systems and a regional inspection scheme. ASEAN countries should consider implementing a similar treaty or, in lieu of a formal legal agreement, coordinating to fulfill their safeguards obligations.

ASEAN Power Grid

The introduction of nuclear power requires an efficient, stable and reliable electric grid system. Although individual ASEAN countries have national grid systems, many will require substantial development in order to be suitable for connection to a nuclear power plant. The interconnection of national grids would provide an accelerated solution. In addition to enhanced grid capacity, it would provide reserve margins and improve reliability by enhancing each country's ability to cope with and limit the scope of outages. A regional grid can also lower electricity costs by allowing for better distribution of electricity thus lowering overall demand, and by facilitating the substitution of more expensive fuels by low-cost nuclear power.

Last year, ASEAN energy leaders approved an ASEAN Power Grid feasibility study that is to be completed by 2015. To meet the

targeted introduction of nuclear power—slated for 2020 in some countries—ASEAN should accelerate the interconnection initiative and implement measures to facilitate creating the ASEAN Power Grid, such as harmonization of legal and regulatory standards and agreements on transit and import/export fees.

Financing

Establishing the ASEAN Power Grid would also expedite the possibility of regional financing for nuclear power plants in the region. An emerging nuclear financing model, adopted in the construction of new plants in Finland and France, involves a partnership between nuclear utilities and industrial customers. The partnership allows industrial customers to either provide part of the capital investment or pay part of their long-term electricity contracts in advance in exchange for a long-term and low-cost supply of electricity from the utility.

Once plans for an ASEAN regional grid are solidly in place, a multinational partnership of electricity-intensive industrial customers can be established. A regional partnership would increase financing capacity and allow for greater selection of technologies, thus lessening dependence on substantial financing by vendors alone. This plan is also feasible because the projected dates for nuclear power development by various ASEAN countries are somewhat staggered, so funds would only be required for one to two reactors at a time.

Nuclear Liability and Insurance

Establishing an internationally acceptable nuclear liability regime is a prerequisite to attracting vendors to participate in new nuclear power programs and to ensuring adequate compensation for victims in the unlikely event of a nuclear accident. In ASEAN, only Indonesia and the Philippines have signed and no country has ratified the Vienna Convention on Civil Liability for Nuclear Damage.

A regional approach to nuclear liability may be ideal for ASEAN because of concerns about the cross-border effects of a nuclear accident. All countries in a region could adopt an acceptable liability regime and ASEAN countries should jointly develop a milestones plan for implementing nuclear liability regimes in their respective countries. The countries can also engage in collaboration on developing nuclear liability legislation, providing for resource and cost savings. Finally, a regional nuclear insurance pool could be established to maximize insurance capacity.

Public Acceptance and Confidence Building

Although public education campaigns about nuclear power tend to be national initiatives, regional cooperation on public acceptance and confidence building can be a powerful tool. In addition to jointly developing effective materials on the benefits of nuclear power and sharing experiences, ASEAN countries could promote cross-border success stories. The successful implementation of nuclear power in one country helps to ease the development of a nuclear program for its neighbors.

Supplier Relations and Export Controls

All countries in ASEAN considering nuclear power will be importing nuclear technology, equipment and material from foreign sources. Before nuclear imports can be executed, countries will have to enter into bilateral nuclear cooperation agreements with supplier countries and comply with a variety of conditions, including implementing measures to control the re-exports of foreign technology and

products. Failure to do so can severely delay nuclear development and construction. ASEAN countries should work together to address supplier relations and export-control-related issues before they arise and collaborate on best practices for developing legal and regulatory infrastructure for the control of nuclear technology, equipment and material.

Additional Areas of Cooperation

The potential for regional cooperation in nuclear power development is infinite. Other infrastructure collaboration such as coordinated R&D activities, knowledge sharing, and collaboration on lessons learned in siting, environmental assessments and construction could be beneficial to ASEAN. Harmonization of legal and regulatory standards across a variety of nuclear disciplines could be implemented as well.

A stronger ASEAN nuclear union means a smoother path to nuclear power for each one of its members. Now is the time for Southeast Asia to move forward.

