Vietnam

Market Type: Newly Emerging

To help satisfy booming electricity demand, Vietnam is projected to be the first country in Southeast Asia with a civil nuclear energy program. Two proposed plants in Ninh Thuan province are being built by Russia and a Japanese-led consortium, with up to 10 reactors planned for deployment by 2025. Future sector growth offers opportunities for American exporters.

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Vietnam is the first country in Southeast Asia moving forward on developing a peaceful nuclear power program. In late 2009, the National Assembly approved plans to construct Vietnam’s first two nuclear power plants (NPPs) in coastal Ninh Thuan province by 2025 with two turbines of 1000 MW each. The Government of Vietnam (GVN) has awarded contracts to Russia’s Atomstroyexport and a Japanese consortium to each build a two-reactor NPP. Russia has agreed to fully finance its plant, and Japan will likely finance up to the Organization for Economic Co-operation and Development’s (OECD) limit of 85 percent. Russia and Japan have a head-start over the United States in terms of reactor projects in Vietnam, primarily due to both countries’ ability to provide government-backed finance and other incentives.

The GVN plans to develop the Ninh Thuan 1 and 2 NPPs with a total of eight 1000 MWe reactors coming on line annually from 2020 to 2027, although these plans will likely be delayed up to four years due to ongoing negotiations on technology and financing. Vietnam has announced plans to build up to 13 NPPs with a total capacity of 16,000 MWe over the next two decades. These announcements present rapidly emerging opportunities for the U.S. civil nuclear industry. Vietnam’s civil nuclear market is currently estimated to be worth $10 billion and is expected to grow to $50 billion by 2030. As of March 2016, Vietnam plans to supply 5.7 percent of its electricity through nuclear energy by 2030 and 25 percent by 2050.

Planned Nuclear Energy Projects

Ninh Thuan 1 Nuclear Power Plant (Phuoc Dinh)
Owner: Atomstroyexport-ROSATOM (Russia): state-owned
Reactor Type: VVER-1000 reactors, later specified as AES-91 power plants
Capacity: 4 units x 1000 MW (2 planned, 2 proposed)
Value of Project: A finance agreement of up to $9 billion was signed in November 2011 with the Russian government’s state export credit bureau, and a second
agreement for a $500 million loan covered the establishment of a nuclear science and technology center.

Construction Period (tentative): To begin in 2020 as a turnkey project.

Operation (tentative): 2028 for the first two reactors, with two more proposed coming online at a later date

Cooperation with Russia Regarding Ninh Thuan 1: Russia’s Ministry of Finance is prepared to finance at least 85 percent of the first plant. For the first two reactors, Russia’s policy for building NPPs in non-nuclear weapon states is to deliver on a turnkey basis, including supply of all fuel and repatriation of used fuel for the life of the plant. The fuel is to be reprocessed in Russia and the separated wastes returned to the client country eventually. Russia has also agreed to build a new 15 MW research reactor at Da Lat, starting in 2017, for operation in 2023.

Ninh Thuan 2 Nuclear Power Plant (Vinh Hai)

Owner: JINED consortium including METI, nine utilities (led by Chubu, Kansai and Tokyo Electric Power Company) and three manufacturers (Mitsubishi Heavy Industries, Toshiba and Hitachi)

Reactor Type: Construction has been delayed beyond the initial plan of 2015, creating uncertainty around the type of reactor to be built. WEC’s AP1000 and Mitsubishi/Areva’s Atmea1 are being considered as reactor types.

Capacity: 4 units x 1000 MW

Value of Project: $10 billion

Construction Period: To begin in 2020.

Operation (tentative): 2028-2029

Cooperation with Japan Regarding Vinh Hai: EVN signed agreements with Japan Atomic Power Corporation (JAPC) in 2011 for consulting services to help with site selection and a $26 million Japanese government-funded feasibility study, completed in May 2013, that included technology selection with economic and financial analysis. Japan has committed to train about 1,000 staff for Ninh Thuan 2. A financial agreement between Vietnam and the Japanese government is still in negotiation.

Commercial Opportunities

Services (front and back-end): Second tender for Owner’s engineering service for Ninh Thuan 1 and 2 projects will be issued after selecting the EPC contractor in 2019.

Legal and Consulting Services: Many opportunities for assisting with front-end services, including site selection, licensing, liability and project management.

Design, Construction, and Operation: Vietnam has not yet selected a reactor technology. Currently, Westinghouse-Toshiba (AP1000) and Mitsubishi/Areva (Atmea1) are competing for a project.

Waste Management: The Russian government has committed to assist the GVN in waste management. In March 2013, JINED organized a workshop to introduce how Japanese NPPs manage waste to Vietnamese ministries and Electricity of Vietnam Corp.

Challenges and Barriers to Exports

Vietnam’s decision to contract with Russia and Japan for its first two reactor projects presents great challenges for U.S. industry to enter the market. The GVN has recently courted other countries, particularly the Republic of Korea, for bilateral civil nuclear cooperation, highlighting the high-level of foreign competition in this market. Despite strong foreign competition, U.S. government and industry remain highly engaged with Vietnam, and the U.S.-Vietnam 123 Agreement will enable broader and deeper cooperation, strengthening the U.S.-Vietnam bilateral relationship for civil nuclear energy. If the GVN stands by its nuclear development plans, U.S. industry will have great opportunities for exports.

GVN support for nuclear energy is strong, though its January 2014 announcement to postpone construction of its first two projects for up to four years brings into question the GVN’s commitment to meeting its ambitious goals for nuclear energy development. If it follows through with its plans to build additional reactors, U.S. industry will have significant chances to compete for tenders and other contracts.

Liability continues to be a major obstacle. Efforts by the U.S. government and industry to promote the CSC have increased the GVN’s awareness of the need for strong liability protections and have resulted in the GVN making tentative commitments to signing it. Vietnamese ratification of the CSC would greatly improve the prospects of U.S.-Vietnam civil nuclear trade.

Financial obstacles exist for civil nuclear exports to Vietnam. Russia and Japan won their construction
contracts in part due to the significant financial incentives they offered, including financing deals. Vietnam scores low on both the Ex-Im Bank Long-Term Exposure Fee level and the World Bank Ease of Doing Business Indicator, potentially hampering U.S. industry’s ability to offer similar incentives. Additionally, U.S. industry’s inability to offer BOO construction or, as Russia has done, to take back and reprocess spent fuel may put U.S. industry at a disadvantage for future tenders.

**Nuclear Infrastructure**

**Research Reactor:** Vietnam has a 500 kW research reactor at Da Lat that has been operational since 1984. It is operated by Vinatom and was converted to run on low-enriched fuel in 2007 in partnership with the United States.

**Fuel:** Vietnam’s Ministry of Natural Resources & Environment is working with Canadian company NWT Uranum Corp to exploit a uranium deposit in Quang Nam province that is believed to have about 7000 tU in 0.05 percent ore. Despite this development, Vietnam plans on importing all fuel for its planned reactors.

![Figure 1: Vietnam Electricity Mix](image)

**U.S. Government Collaboration**

**123 Agreement:** Agreement entered into force in October 2014.

**Cooperation and Information Exchange:** The National Nuclear Security Administration (NNSA) is involved in 11 programs affiliated with Vietnam and has engaged in workshops with Vietnam in a variety of topics including reactor licensing, nuclear forensics, and nuclear safeguards infrastructure development.

![Figure 2: Additional Agreements](image)

**May 2013 Trade Mission:** In May 2013, the then DOC Undersecretary for International Trade led a delegation of senior U.S. government officials from DOC, DOE, Ex-Im Bank and U.S. industry to work with the GVN on bilateral nuclear energy cooperation. DOC and FCS Vietnam organized a workshop in which U.S. firms shared their experience in nuclear power development with Vietnamese ministries and industry.

**International Engagement**

In recent years, Vietnam has signed nuclear cooperation agreements with Russia, France, China, South Korea, Japan, Canada and the United States. In addition to the reactor deals with Russia and Japan detailed above, Vietnam has asked the Republic of Korea to conduct a feasibility study for a possible Korean NPP in Vietnam.

**Resources**

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For more information on the nuclear energy industry in Vietnam, see:

Ministry of Industry and Trade website
(http://www.moit.gov.vn/en)

Sources