



2016 Top Markets Report **Civil Nuclear** Country Case Study

Bulgaria

Market Type: Existing and Expanding

Bulgaria is considering expanding its current fleet of two reactors, but negotiation breakdowns and cancellations have delayed construction plans. Russia’s presence in Bulgaria’s nuclear sector represents a challenge for U.S. exporters, as does Bulgaria’s financing and business environment. Public and political support for nuclear energy remains strong, however.

New Builds

13

Existing Reactors

24

Decommissioning

17

Overall Rank

17

U.S. Ambassador to Bulgaria: Eric Rubin

U.S. Commerce Attaché to Bulgaria: Maria Galindo

Bulgaria currently has two operational Russia-designed VVER reactors and four additional VVER reactors that are permanently shut down. All reactors are located at the Kozloduy site. Bulgaria considered building a new nuclear power station at Belene, but the project was abandoned in February 2013 after several years of negotiations with Russia. In March 2015, Bulgaria delayed its plan to build a new reactor at Kozloduy after a suspension in negotiations with Westinghouse.

Bulgaria’s National Energy Strategy, published in 2011, indicates that Bulgaria is strongly considering extending the life of Kozloduy units 5 and 6 as well as building new units. The main activities in the nuclear energy field are safety operation of the existing two units (2000 MW capacity), construction of up to two new reactors at Kozloduy and construction of a dry spent fuel storage facility.

Public support for nuclear energy is strong in Bulgaria. In January 2013, a public referendum showed 61 percent of voters supporting the construction of a new

NPP; however, turnout for the vote remained low—21 percent—making the vote non-binding but large enough to spark debate and discussion in parliament. A January 2009 gas shortage prompted Bulgarian citizens to take to the streets in support of restarting reactors at Kozloduy. Political movements within Bulgaria have also tied nuclear energy to Bulgaria’s emergence as a technologically advanced nation.

Kozloduy units 5 and 6 are undergoing an upgrade and modernization program. They are currently licensed through 2017 and 2019. Kozloduy Nuclear Power Plant plc signed a contract with Rosenergoatom and EDF to extend their lifetimes from 30 to 50 years. In October 2015, parties reached an agreement for Rosatom to modernize unit 5 by May 2018 with a project cost of €24.7 million. The Government of Bulgaria (GOB) is under pressure to modernize the units in order to keep electricity prices low.

Planned Nuclear Energy Projects

Owner: State or shared

Reactor Type: PWR AP 1000 *Capacity:* 1,000MW

Capacity: 1,000 MWe

Value of Project: N/A

Construction Period: Not started – potentially 2020

Operation (tentative): 60 years

Kozloduy NPP: New Build EAD, the state-controlled project company, was granted permission by the Bulgarian Nuclear Regulatory Agency (NRA) to select the location of a planned nuclear generation facility. NRA official permission marks the beginning of the licensing procedure for the construction of a new NPP in Bulgaria. The project has been on hold since the March 2015 expiration of Westinghouse's Shareholder's Agreement with BEH. The GOB is seeking a strategic investor for the project.

Commercial Opportunities

Services (front-and back-end): Limited opportunities for decommissioning, though Russian technology of Kozloduy 1-4 will make it harder for U.S. companies to play a large role.

Legal and Consulting Services: Many opportunities exist. Several U.S. companies have consulted with the GOB on Belene NPP. Further opportunities exist for Kozloduy units 5 and 6's lifetime extension and plans for new construction.

Licensing Support: The Bulgarian NRA is the only state body that can issue, amend, modify, renew, suspend and revoke licenses and permits for the safe conduct of NPP activities in Bulgaria.

Design, Construction, and Operation: Opportunities exist for new construction at Kozloduy, but new projects have been placed on hold following a breakdown in negotiations with Westinghouse.

Components: Moderate opportunities exist for operating plants. Reactor vessels, core, refueling machinery, turbines, storage equipment, etc. are manufactured in Russia.

Challenges and Barriers to Exports

Bulgaria's initial 2013 decision to sole-source Westinghouse for the Kozloduy extension project indicated significant potential opportunities for U.S. industry in this market, which has been difficult to enter due to its fleet of Russian reactors. Despite the failure in talks, the GOB remains hopeful that a deal can be reached with Westinghouse.

Government support for nuclear energy is strong and public opinion is supportive, but several obstacles exist

that could delay Bulgaria's new build plans or add additional challenges to U.S. industry engagement.

Bulgaria remained on USTR's Special 301 Watch List in 2015 for only taking limited steps to address persistent U.S. concerns regarding IPR infringement, making it challenging for U.S. companies to cooperate with Bulgarian companies on big projects such as new reactor builds.

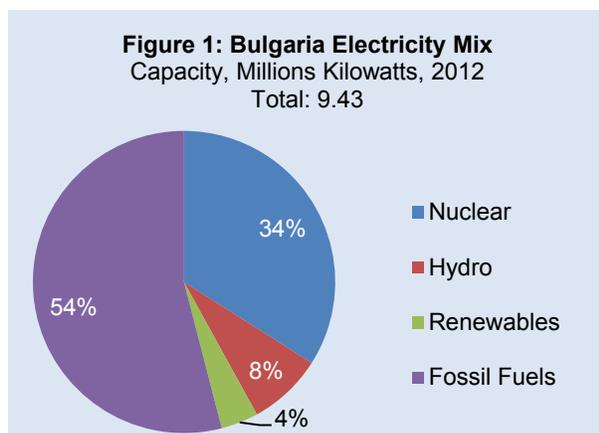
Financing new nuclear power projects is also a key obstacle for Bulgaria. Bulgarian debt owed to the United States and other countries makes provision of Ex-Im Bank financing a challenge. Bulgaria receives a low score on Ex-Im Bank's long-term exposure fee level and also has a relatively low score on World Bank's Ease of Doing Business Indicator.

Nuclear Infrastructure

Research Reactor: The Institute for Nuclear Research and Nuclear Energy (INRNE) of the Bulgarian Academy of Sciences in Sofia operates Bulgaria's sole research reactor. The reactor's original capacity was 1 MWe in 1959 and was increased to 2 MWe in 1970, but the reactor was shut down in 1989. Currently the reactor is being modified to operate on low enriched uranium (LEU) at a 2kW capacity. Bulgaria returned its highly enriched uranium (HEU) to Russia in 2003, with used HEU and LEU following in 2008.

Fuel: All front end fuel cycle services in Bulgaria are provided by Russia's TVEL through Techsnabexport.

Waste Management: State Enterprise Radioactive Wastes (SE-RAW) oversees the majority of Bulgaria's waste management. A 2002 agreement between Bulgaria and Russia established payment of USD 620,000 per ton of spent nuclear waste sent to Ozersk, Russia for reprocessing. Recent funds from the European Bank for Reconstruction and Development (EBRD) have enabled the construction of a dry fuel storage facility (DFSF) for 2800 VVER-440 used fuel assemblies near Kozloduy. Nukem Technologies and Gesellschaft für Nuklear-Service (GNSmbH) partnered to construct the facility. Current plans foresee expanding capacity to accommodate 8000 VVER-440 and 2500 VVER-1000 assemblies. The facility opened in May 2011 with the ability to store 5200 fuel assemblies in 72 casks. The Bulgarian government is also pursuing a national low and intermediate level waste disposal facility to be built on a site adjacent to Kozloduy.



U.S. Government Collaboration

123 Agreement: Bulgaria has a 123 Agreement with the United States through Euratom.

Agreement for Cooperation: The United States and Bulgaria signed an Agreement for Cooperation in the Field of Peaceful Uses of Nuclear Energy in June 1994, and it entered into force in March 1996.

June 2013 Legal Review and Legislative Drafting Workshop: The U.S. Department of State's Preventing Nuclear Smuggling Program (PNSP) and the Government of the Bulgaria organized a successful workshop in Sofia to assess how Bulgarian authorities would prosecute nuclear and radiological smuggling cases under existing criminal laws.

Technological Exchange: The U.S. Nuclear Regulatory Commission and Bulgaria's NRA have an arrangement for the exchange of technical information and cooperation in nuclear safety matters.

U.S. Export Support: Ex-Im Bank has supported U.S. civil nuclear exports to Bulgaria with a \$77 million facility in July 2000 for the upgrade of the Kozloduy Nuclear Power Plant.

Non-Proliferation Treaty	✓
IAEA Comprehensive Safeguards Agreement & Additional Protocol	✓
Joint Convention on Safety of Spent Fuel Management	✓
Convention on Nuclear Safety	✓
Convention on Early Notification of a Nuclear Accident	
Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	

Paris Convention on Third Party Liability in the Field of Nuclear Energy	
Vienna Convention on Civil Liability for Nuclear Damage	✓
Joint Protocol Relating to the Application of the Vienna Convention and Paris Convention	✓
Convention on Supplementary Compensation for Nuclear Damage (CSC)	
Organization Membership	
IAEA	✓
Nuclear Suppliers Group	✓
OECD/NEA	
IFNEC	✓
GenIV International Forum (GIF)	

International Engagement

Bulgarian Energy Holding Company (BEHC)—a 100 percent state owned energy holding company—reached an agreement with France's AREVA in April 2011 as part of Bulgaria's commitment to developing low-carbon energy projects. The memorandum of understanding (MOU) identifies plans for cooperation on new nuclear projects on the Kozloduy and Belene sites. The agreement also identifies fuel management policies and responses, such as spent fuel recycling as well as meeting international standards for nuclear safety. The agreement with AREVA provides BEHC access to AREVA's portfolio of Generation III nuclear reactor, which guarantees higher safety levels.

Resources

For more information on the commercial opportunities in Bulgaria, contact: Thomas Bruns (Senior Commercial Officer in Sofia, thomas.bruns@trade.gov) Emily Taneva (Commercial Specialist in Sofia, emily.taneva@trade.gov); I&A Civil Nuclear Team: Jonathan Chesebro (jonathan.chesebro@trade.gov).

For more information on nuclear energy in Bulgaria, see: Bulgarian Energy Holding: <http://www.bgenh.com/>

Sources

CIA Factbook, United Nations, World Nuclear Association, Asian Development Bank, and contacts at U.S. Embassy Sofia.