RENEWABLE LAND OF

60%

Share of electricity generation from hydropower in total production

Simón Bolívar 'Guri' hydroelectric power plant

Installation of one of the world's largest Francis runners (770 MW) in Simón Bolívar 'Guri' hydroelectric power plant in 2012.

Venezuela – In 1498, Christopher Columbus reached the coast of a land that enchanted the navigator because of the deep and green nature of its jungle and "an imposing river that fought against the sea". In a letter to the Monarchs Columbus referred to this place as "The Land of Grace".[1] This land of grace was the coast of what today is Venezuela, and the imposing river is the Orinoco.

Abundant in fossil fuels such as coal, oil, and gas, now Venezuela is looking at meeting the demands of the energy transition with its own resources too. Blessed with water, Venezuela has the second largest installed hydroelectric capacity in South America.[2] It is easy to conclude that the country has exceptional conditions to face this new energy era and ANDRITZ is a key partner organization in helping Venezuela meet its clean energy goals.

(1) Letter from Columbus written from the island of Hispaniola about the third voyage to the Americas in 1498. ('Cristobal Colón y Lope de Aguirre: La otra Historia' por Rita Jáimez)
(2) 2023 World Hydropower Outlook, IHA 2022, Venezuela 16,827 MW (second after Brazil)
(3) EUROBRAS Consortium is made up of 50% ANDRITZ Hydro Germany and 50% Voith Brazil

ENERGY IN A

F GRACE

JOSÉ A. RODRÍGUEZ 'PEÑA LARGA' HYDROELECTRIC POWER PLANT REHABILITATION

In 2006, ANDRITZ received a contract for the modernization of this plant located near the city of Barinas. The update included two vertical Francis turbine generation units (2 × 40 MW), with the total scope including the design, manufacturing, and assembly of new runners for the two turbines, new speed governors, excitation, protection, and control systems. This is in addition to a proprietary monitoring and diagnosis system.

SIMÓN BOLÍVAR 'GURI' HYDROELECTRIC POWER PLANT REHABILITATION

Barinas was the prelude to modernization contracts for other vertical Francis machines. However, the extraordinary dimensions of these machines required the implementation of new designs to solve a cavitation problem. The cavitation phenomenon affected the units in their normal range of operations and increasing power and efficiency represented a significant engineering challenge for the ANDRITZ Germany-led EUROBRAS Guri Consortium.[3] The EUROBRAS Consortium was commissioned to modernize the five units in powerhouse No. 2 of the Simón Bolívar hydropower plant.

After the rehabilitation program, the Francis turbines have a nominal power of 710 MW (previously 635 MW) and a maximum power of 770 MW (previously 710 MW). The cavitation problems were solved, power increased, and all efficiency requirements were reached.

PROSPECTS FOR HYDROELECTRICITY IN VENEZUELA

Considering the national power capacity of 16,829 MW and the dominance of hydroelectricity, ANDRITZ recognizes an important future potential associated with modernization of the hydropower fleet. Major equipment such as valves, turbines, and generators, together with technological updates that requires the digitalization of the electronic systems, represent a substantial opportunity. At ANDRITZ, we are ready to meet all future requirements of local authorities in relation to the modernization of Venezuela's hydroelectric fleet.

AUTHOR

Carlos Sgro
hydronews@andritz.com

VENEZUELA

Total population: 28.30 billion
GDP per capita: 3,421 USD

Total installed hydro capacity: 16,829 MW
Share of generation from hydropower: ~62%
Hydro generation per year: 80,000 GWh
Technically feasible hydropower potential: 62,400 MW

All figures concern 2022;
Sources: TheWorldBank, IMF, IHA, Hydropower & Dams World Atlas 2023