

RESURGENCE OF REHABIL



Mexico – In recent years, the Mexican Government’s energy policy has been focused on the conservation and improvement of National Electric System’s reliability levels. This strategy comes in conjunction with plans to advance an ordered energy transition to comply with commitments made by the Mexican State, as reflected in international agreements and treaties.

As part of the approach to meet growing electricity demand, a program is being developed for the rehabilitation, modernization, and equipment upgrade of the hydroelectric plants in operation by the Federal Electricity Commission (CFE). This state-owned Mexican company has an installed hydroelectric capacity of 12,125 MW and the program is designed to achieve the maximum utilization level of this infrastructure. Simultaneously, progress is being made on a program for the installation of new hydroelectric plants within existing civil infrastructure originally designed for other purposes, such as flood control or irrigation.

F IMITATION



The need to improve the national power grid's stability is also creating opportunities for developing new technological solutions, such as synchronous condensers.

ANDRITZ' PRESENCE IN MEXICO

ANDRITZ has had an enduring presence in Mexico since the early 20th century when its predecessor companies supplied equipment for the first hydroelectric power plants built in the country. Since then, ANDRITZ has supplied, rehabilitated, or modernized over 300 hydropower units with a total capacity of nearly 7,600 MW.

A cornerstone of his impressive record of achievement is the ANDRITZ company founded in Morelia, Michoacán, in 1981. This local company currently employs more than 400 people in engineering and manufacturing capabilities, project management, installation, and commissioning, as well as after-sales service at this location.

ANDRITZ' local operations encompass four strategic segments: Large Hydro, Compact Hydro, Service & Rehab →

MEXICO

Total population: 127.50 million

GDP per capita: 11,265 USD

Total installed hydro capacity: 12,614 MW

Hydro capacity under construction: > 840 MW

Share of generation from hydropower: 10%

Hydro generation per year: 31,848 GWh

Technically feasible hydro generation potential: ~ 135,000 GWh

All figures concern 2022;

Sources: TheWorldBank, IMF, IHA, Hydropower & Dams World Atlas 2023



Power unit hall of Angostura hydropower plant



Pelton runner at Zimapan hydropower plant



On-site installation team, Humaya hydropower station



Generator stator at Peñitas hydropower station

→ (hydroelectric plant modernization), and Automation. These segments sit at the heart of the evolution and modernization of the hydroelectric power generation sector in Mexico.

Our range of products and services spans turbines, generators, gates, and valves as well as excitation, control and protection systems, post-sales service including operation and maintenance services for assets, and small service with a focus on mechanical and electrical solutions.

Consolidating its position as a leader in Mexico's hydroelectric sector development, ANDRITZ is successfully leading a consortium that, at the end of 2021, secured strategic contracts for the renovation of nine hydroelectric power plants across the country.

These contracts, awarded by the CFE, represent a milestone in developing a



more efficient and sustainable energy system in the country.

The power plants being modernized are: Humaya (50 MW), Zimapan (304 MW), El Caracol (630 MW), Infiernillo (400 MW), La Villita (320 MW), Mazatepec (244 MW), Peñitas (420 MW), Malpaso (1,152 MW), and Angostura (1,000 MW).

The contracts for this rehabilitation form part of one of the largest modernization programs, not only for the client CFE and ANDRITZ but also for the global hydroelectric market.

The modernization of these power plants will not only strengthen the nation's generation capacity but will also play a fundamental role in ensuring a reliable energy supply for the future of Mexico.

HUMAYA

The modernization of the generator of unit 2 at the Humaya hydroelectric

power plant, which has a capacity of 45 MVA, was undertaken. The installation of a new magnetic core and new winding, along with the rehabilitation of the insulation of the rotor poles, allowed for the complete transformation of both the stator and the rotor. The modernization works have increased the capacity of the Humaya hydroelectric power plant by over 20%, raising the power of the two generators in the plant to 46 MVA with an efficiency of 98%.

The improvements to the power plant will enable more reliable and efficient electricity generation, benefiting both consumers and the operating company.

SANTA MARÍA

The renewable energy field is constantly evolving, and one of the most promising projects in this energy revolution is the installation of modern equipment at the Santa María Dam in Rosario, Sinaloa. This project achieved a significant milestone





→ in May 2022 with the awarding of a contract that includes two butterfly valves with a nominal diameter of 3,500 mm with double sealing.

These valves, whose workshop tests were approved for on-site installation, represent the ANDRITZ commitment to quality. The commissioning was completed in December 2023.

In May 2023, ANDRITZ was entrusted with a follow-up contract for the same hydropower plant for the supply of electromechanical equipment including two Francis-type units of 15MW each, inlet valves, electric generators, control equipment, speed governors, excitation, protection, and assembly

services. The new equipment promises to take Santa María to new levels of capacity and efficiency in renewable energy generation allowing the control of the flow of the Baluarte River and bringing us closer to the two main objectives of this multipurpose project: the irrigation of 24,250 hectares of agricultural land and the supply of drinking water to almost 430,000 inhabitants of the surrounding communities.

THE PRESIDENT PLUTARCO ELÍAS CALLES THERMAL POWER PLANT (PETACALCO)

Located in the municipality of La Unión de Isidoro Montes de Oca, Guerrero, Mexico, this power plant has been a major contributor to national electricity

10% Share of electricity generation from hydropower in total production

Butterfly valve installation at Santa María hydropower plant



Electric cubicles at Mazatepec hydropower plant

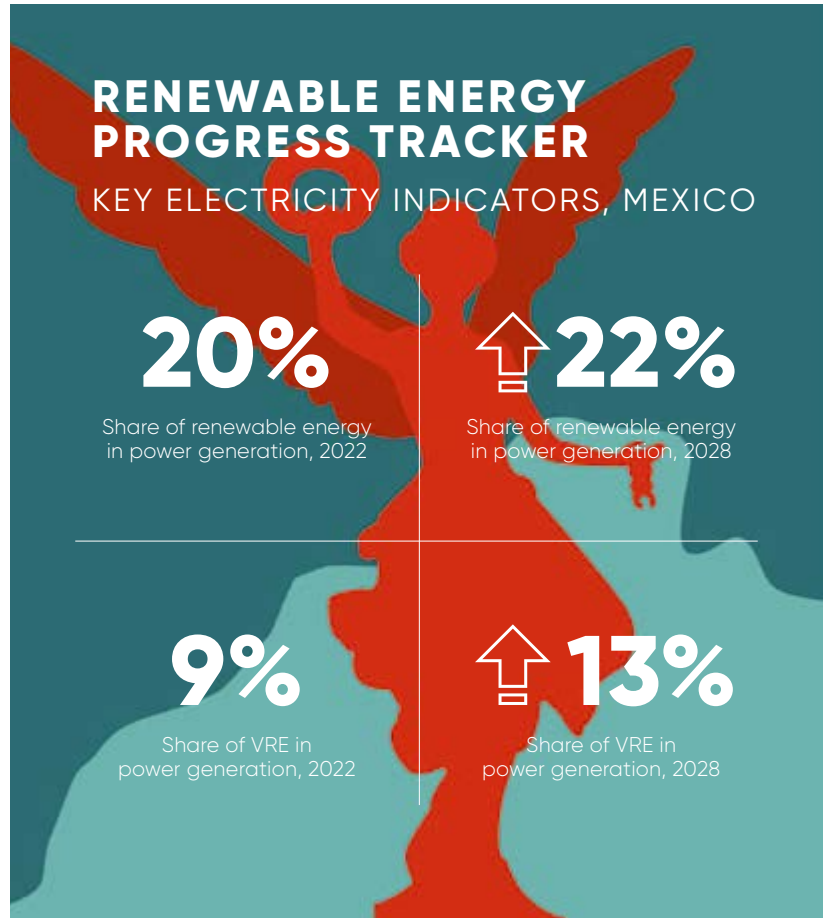


generation since it commenced operations in November 1993. With seven generators boasting a total installed capacity of 2,778 MW, it stands out as one of the largest in Latin America.

In an ongoing commitment to efficiency and innovation, the owner of the power plant has awarded ANDRITZ an order for the acquisition, installation, and commissioning of two static excitation systems, designated for generating units 3 and 6. These systems, with advanced technical features including HIPASE-E and a redundant configuration for uninterrupted operation, reinforce Petacalco's position as a reliable and efficient energy source in the region.

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Source: IEA

Combined bearing, Unit 1, La Villita hydropower plant



Main transformers, Malpaso hydropower plant

