

## First power production at the Grand Ethiopian Renaissance Dam

Ethiopian Prime Minister Abiy Ahmed Ali officially inaugurated electricity production from the Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile in the western region of Beni-shangul-Gumuz on 20 February with the startup of its first 375 MW unit. "Today the GERD's first turbine began generating power," Abiy Ahmed announced from the project site. "This is good news for our continent and the downstream countries with whom we aspire to work. As Ethiopia marks the birth of a new era, I congratulate all Ethiopians". When completed, the GERD will be the largest hydropower dam in Africa, with an installed capacity of 5150 MW and average annual production of 15 700 GWh. It will help supply power to many of the 65 million Ethiopians who still live without electricity, officials say, as well as support economic development and help reach the country's goal of becoming carbon neutral by 2025.

Construction of the €3.48 billion (US\$ 4.2 billion) project by Italy's Webuild on behalf of Ethiopian Electric Power began in April 2011 and is scheduled for completion in 2024. The project is self-financed with dam bonds and contributions from civil servants' salaries.

Located around 700 km northwest of the capital Addis Ababa, the project, which is 84 per cent complete according to Webuild, will feature a 145 m-high (170 m-high from the deepest point of the base to the crest), 1800 m-long RCC gravity dam, a 50 m-high rockfill saddle dam, a 15 000 m<sup>3</sup>/s capacity concrete spillway, and two powerhouses installed at the foot of the dam on either side of the Blue Nile that will be equipped with a total of two 375 MW turbines and eleven 400 MW units. Five of the turbine-generator units are being supplied and installed by GE. The reservoir will have a storage capacity of  $74 \times 10^9$  m<sup>3</sup>, representing nearly the Nile's entire  $84 \times 10^9$  m<sup>3</sup> annual flow. Filling of the reservoir began in July 2020 and is expected to

take between four and seven years, depending on hydrological conditions. The second phase of filling was completed in July 2021. On average some 10 000 people have been working to build it every year, said Webuild.

The GERD will allow Ethiopia to generate and export renewable electricity, avoiding the emissions of more than  $2 \times 10^6$  tonnes of CO<sub>2</sub> a year, according to Webuild. However, the dam, an icon of national pride, has caused diplomatic tensions with its downstream neighbours Sudan and Egypt which claim it will cause water shortages downstream. Egypt, which depends on the Nile for about 97 per cent of its irrigation and drinking water, fears it could suffer from water shortages, especially during periods of drought, and is anxious about Ethiopia's potential plans to build more hydropower dams upstream of the dam. Another concern for Egypt is that other countries with which it shares the White Nile, a main tributary of the river, might also start to construct dams without regional agreement.

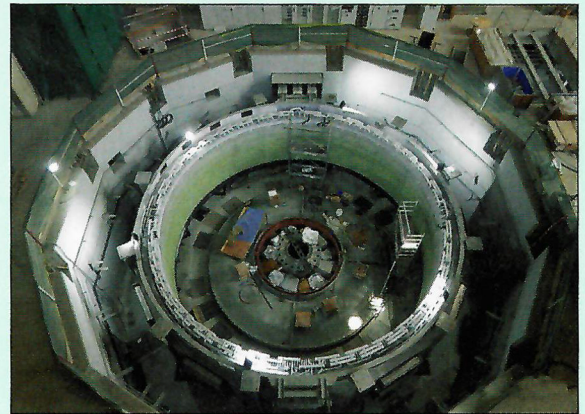
Sudan expects the project will help regulate annual flooding but, however, also fears the operation of its own dams and hydropower plants could be disrupted without agreement on the GERD's operation. Talks brokered by the African Union have so far failed to produce agreement among the countries on the dam's filling and operations. Ethiopia has expressed the view that the GERD will cause no damage to its downstream neighbours, and contends that it could even benefit Sudan. "For the Ethiopian people this is a means to access electricity, for the downstream countries it is very positive; flow to downstream will never be interrupted," Seleshi Bekele, Ethiopia's chief negotiator and Abiy's top adviser on the GERD, told *The Financial Times* in an article published on 21 February. "The dam will bring a lot of benefits downstream in terms of managing the water better, especially during times of flood or drought. It will

be managed in a more enhanced way," he added.

For Abiy, "Ethiopia's main interest is to bring light to 60 per cent of the population currently suffering in darkness, and to save the labour of women who are carrying wood on their backs to have energy," he said. "As you can see, this water will generate energy while flowing as it previously flowed to Sudan and Egypt."

Ethiopia, the second most populous country on the continent, has the second largest electricity deficit in Africa, according to the World Bank, with about two-thirds of the population of about 110 million lacking a connection to the grid.

*One of the units being installed at the 5150 MW powerplant, and below, view of the GERD from downstream*



## Uzbekistan's Farkhad plant resumes operation after modernization

The 127 MW Farkhad hydropower plant on the Syr Darya river in the Syrdarya region of Uzbekistan has resumed full operation, following modernization and repowering, the Ministry of Energy announced on 15 February. The modernization of all four units, which was carried out on behalf of the state hydropower producer Uzbekhydroenergo by Power Machines, under a turnkey contract signed in December 2017, has increased the plant's total in-

stalled capacity by 11.4 per cent from 114 to 127 MW, providing for a projected increase in annual electricity production of 84 to 531 GWh, while extending the lifetime of the plant's machinery by 40 years. The €56.5 million (US\$ 64 million) contract entailed the modernization of the four Kaplan turbines and generators, as well as the transformer equipment and automated control systems.

The Farkhad dam, a 27.5 m-high

concrete gravity arch structure, and its reservoir with a maximum storage capacity of  $350 \times 10^6$  m<sup>3</sup>, are located in Sughd Province in Tajikistan, and the hydropower station is located in Uzbekistan and operated by Uzbekhydroenergo. Construction of the dam and powerhouse began in 1942-43 and the dam and four units were commissioned in 1949. The powerhouse was originally equipped with two 30 MW units and two 33 MW units.