# LAND OF GREAT CONTRASTS

*Pakistan has a semi-industrialized economy based largely on agriculture and a growing services sector. With one of the world's largest and fastest-growing middle classes, Pakistan is ranked among the emerging and growth-leading economies.*

Over the last several years, the macroeconomy has stabilized. However, to attract foreign investment and support further economic growth, additional economic reform and development of the energy sector is necessary.

Pakistan's energy mix is split among fossil fuels (69%), hydropower (21%) and other renewables and nuclear power (10%). In April 2019, Pakistan declared to have 30% of its energy capacity coming from renewable sources by 2030. The International Hydropower Association states that Pakistan has a technically feasible hydropower potential of about 60,000 MW.

During 2018, three long-delayed mega hydropower projects were successfully completed and commissioned. With a cumulative generation capacity of 2,487 MW, the projects include the commissioning of the 108 MW Golen Gol hydropower project, the 1,410 MW Tarbela fourth extension, and the 969 MW Neelum Jhelum hydropower projects.

In 2018, close to 22 GW of new renewable hydroelectric capacity was put into operation worldwide. By commissioning additional capacity collectively reaching 2,487 MW, Pakistan is positioned as the world's number 3 in hydropower installation ranking. Following only China (8,540 MW) and Brazil (3,866 MW), Pakistan's hydropower is making a significant contribution to a clean and sustainable future.

## Pakistan ranked as the world's No. 3 in hydropower installation

### ANDRITZ HYDRO IN PAKISTAN

ANDRITZ has been active in Pakistan for more than 75 years, supplying equipment and complex project execution. Across Pakistan to date, more than 71 units with a total capacity of 4,723 MW have been installed and/or rehabilitated by ANDRITZ. Among the long list of important projects for ANDRITZ are Allai Khwar with 121 MW and Duber Khwar with 130 MW. Both of these projects, which have been completed and handed over to the customer, are outstanding signature projects representing the first high head Pelton units in Pakistan.

**New Bong Escape** (84 MW): This project, the first private large hydropower station in Pakistan, features four Kaplan Bulb turbines each rated at 21 MW.

**Golen Gol** (108 MW): Three Pelton units of 36 MW each, have been commissioned successfully, the last from June

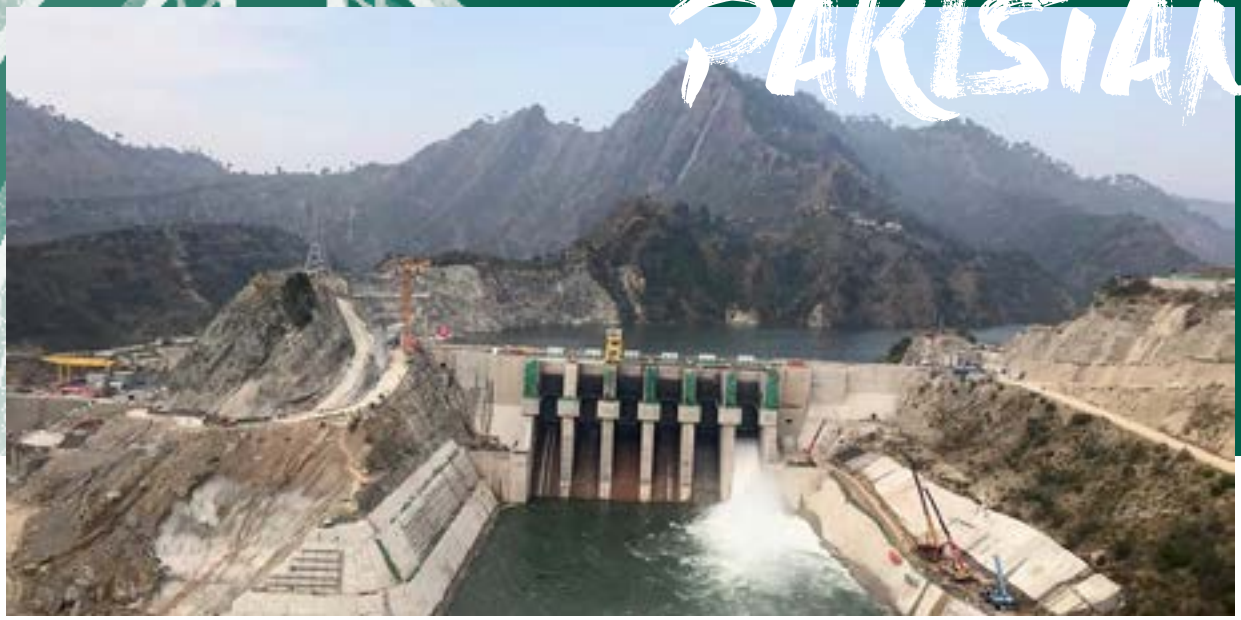
## GENERAL FACTS

Population: **212 million**
Access to electricity: **70.8%**
Installed hydro capacity: **9,500 MW**
Hydropower under construction: **4,675 MW**
Share of generation from hydropower: **21%**
Hydro generation per year: **28,562 GWh**
Technically feasible hydro generation potential per year: **204,000 GWh**

**ANDRITZ Hydro in the country:**
Total installed / rehabilitated units: **71**
Total installed / rehabilitated capacity: **4,723 MW**

**Successful model test for the largest Pelton turbines in Pakistan. Suki Kinari, Kunhar River, 840 MW**

# PAKISTAN



Gulpur, Poonch River, 102 MW

to October 2019. The ANDRITZ installation team recovered the timetable even though the project was delayed by civil works and heavy floods.

**Gulpur** (102 MW): Gulpur is currently in the final installation phase with more than 350 local ANDRITZ erection specialists working to install two Kaplan units of 51 MW each. Commercial operation should commence in 2020.

**Suki Kinari** (840 MW): ANDRITZ was awarded a contract to supply four 210 MW Pelton units for this project, which will be the largest Pelton turbines in the country.

**Tarbela Dam** (6,298 MW): Tarbela Dam is an earth-filled dam along the Indus River and the largest of its kind in the world. It is also the largest dam by structural volume. Completed in 1976 and designed for irrigation as well as flood control, the generation of hydroelectric power is the dam's primary function. ANDRITZ was the OEM for all units except the earliest units, #1 – #4. The company has also been awarded several projects at Tarbela, including modernizing, refurbishing and delivering electro-mechanical equipment, the world's largest penstocks as listed in the Guiness Book of World Records, and gates. The existing powerhouse consists of 14 units (10 × 175 MW, 4 × 432 MW). The installed capacity of 4,888 MW will be increased to 6,298 MW after completion of the planned fifth extension.

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Golen Gol, Golen Gol River, 108 MW

Allai Khwar, Allai Khwar River, 121 MW