

# Sahiwal Coal-Fired Power Plant

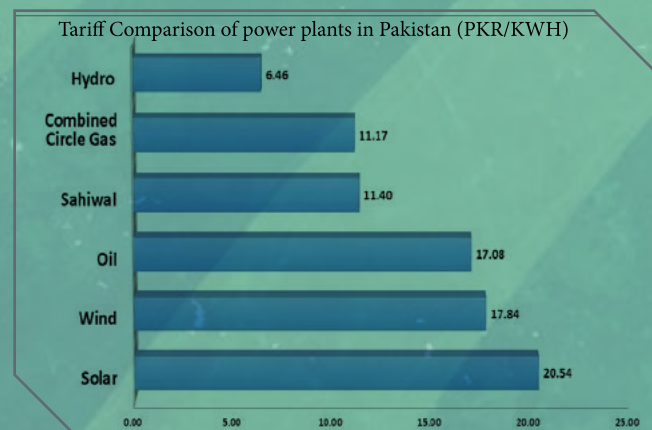
By Dr. Abdul Rauf

Pakistan has seen the worst power shortages in the last few years. This shortfall has not only seriously hampered the industrial goings-on in the country but has also affected domestic activities, thus increasing the sufferings of common people. Therefore, a need was felt to start tackling the power issue immediately under CPEC. Consequently, work on a number of coal power plants including, 1320MW at Sahiwal, 1320MW at Port Qasim, 300MW at Gwadar, 1320MW at Hub and up to 6000 MW planned installation of coal-fired power plants at Thar Block-II using local coal, was started. Sahiwal Power Plant is the first and one of the biggest and advanced coal-fired power plants in operation which stands out in CPEC 'Early Harvest' projects.

Although certain renewable (hydro, wind and solar) energy projects are planned under CPEC but still bulk of energy (69%), is planned to be produced by coal. There may be arguments against the use of coal due to its adverse impacts on environment, but the fact remains that bulk of global electricity generation (above 40%) still uses coal. Such high contribution of coal in world energy mix is due to a number of significant reasons.

Coal is low-cost and easily available. Coal power is highly reliable, stable and can operate with full capacity throughout the year. Construction cycle of

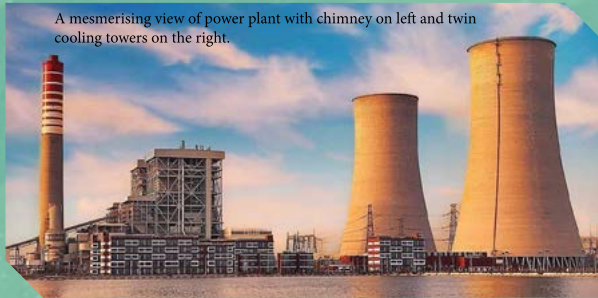
coal power plant is also much shorter (24 to 36 months), which can help to resolve Pakistan's power crisis within a short period of time.



Before the recent commissioning of coal power plants under CPEC, there was hardly any contribution of coal in the production of electricity and even with all CPEC coal power plants fully operational, coal will still contribute a small amount of Pakistan's energy mix and remains much lower than the global average.

Sahiwal coal power plant is located at Qadirabad, 18km northeast of Sahiwal city and 160km southwest of Lahore. This location is the power hub of the country, situated at the load centre of Pakistan, as it is almost equidistant from Lahore, Faisalabad and Multan. An existing 500 kV national transmission line was already

available to connect the power plant with the grid. This helps the supply of generated power efficiently into the grid system to maintain its grid voltage and reduce line losses. The site is adjacent to the main railway line ML-1 and the N5 highway, which provides convenient transportation. Coal transportation is through Pakistan railways, Yousaf Wala Railway Station is just 4.5 KM away and a new railway track had to be laid inside the power plant. Lower Bari Doab Canal (LBDC), that flows adjacent to the plant, is a source of Cooling Water & Feed Water for the power plant.



A mesmerising view of power plant with chimney on left and twin cooling towers on the right.

Total investment on this project is US\$1.8 billion by the consortium of Huaneng Shandong Power Generation Company Ltd and Shandong Ruyi Group, with former holding 51% of shares and is also responsible for running the plant operations and maintenance. Sahiwal Power Plant is equipped with 2x660MW supercritical coal-fired steam generators operating at around 570°C, with annual power output of 9 billion kWh. The construction of the plant was completed in 22 months and 8 days, which was 200 days ahead of schedule. The two units were put into operation on 24 May and 8 June 2017 respectively and the plant started commercial operation on 28 Oct 2017.

**There may be arguments against the use of coal due to its adverse impacts on environment, but the fact remains that bulk of global electricity generation (above 40%) still uses coal**

Coal is currently imported from Indonesia and South Africa which is of much superior quality (high calorific value and less sulphur) as compared to local coal. This coal is imported by sea to Port Qasim from where it is transported to site by the Pakistan Railways Freight Transportation Company (PRFTC). Pakistan Railways is earning quite handsome revenue by running four to five special trains per day with each train transporting 2400 tons' coal (60 wagons and each wagon carrying 40 tons).

The plant is following strict environmental standards and management systems and various environmental protection control measures are in place. Continuous Emission Monitoring

System (CEMS) for monitoring Particulate Matter (PM), SO<sub>x</sub>, NO<sub>x</sub>, CO and Mercury has been set up.

The plant is continuously monitored (including air, water and soil) by environment monitoring agencies including Environmental Protection Agency of Punjab. Electrostatic precipitators (ESP) and flue gas desulphurisation (FGD) are employed to remove particulate matter (PM) including fly ash and SO<sub>x</sub> respectively from the flue gas.



Water reservoirs at the power plant

Plant boilers also employ low NO<sub>x</sub> burners. Thus in accordance with the international environmental quality standards, the flue gas released into air is well within limits of SO<sub>x</sub>, NO<sub>x</sub> and PM. The plant also has its own waste water treatment facility which recycles waste water to water plants. There is a need to continuously monitor the impact of plant operations on environment including air, water and soil.

The power plant also offers employment opportunities to local people. During the construction phase, more than 3,000 local staff were hired, whereas at present about half of the employees are Pakistanis and proportion of Pakistani employees is increasing. So far 171 Pakistani engineers have received technical training from China.

The power plant management company signed Corporate Social Responsibility Agreement and Technical Training Agreement with Government of Punjab. Under this agreement about 200 million PKR per annum are donated to Punjab for social welfare, including medical aid and clean drinking water programs for local communities. The company has also invested more than 500 million PKR to build a technical training school and is providing free language and technical training for local communities with expenses of 200 million Rupees per annum. For this skill building training, the participants are provided free food and accommodation at the power plant ■



The writer holds PhD in Telecom Engineering from University of Sheffield, UK and is a faculty member at NUST.