TAKING ADVANTAGE OF THE INDIAN ENERGY BOOM

by Pradeep Kulkarni, Head of Power, Punj Lloyd Ltd

Power development is seen as crucial to economic growth and social development in India. But the country's estimated energy requirements of 950,000MW by the year 2030, will rely on administrative backing, an infrastructure overhaul, and foreign investment. UK companies should take note

POWER IS A KEY infrastructure element for the robust economic growth of a developing nation. India, today, has the world's fifth largest electricity generation capacity and is the sixth largest energy consumer, accounting for 3.4% of global energy consumption. Due to the fast-paced growth of the Indian economy, the country's demand for energy has grown at an average of 3.6% per year over the past 30 years.

In order to sustain its 8–9% GDP growth rate, India recently made huge strides in the power sector. Despite exponential development in other sectors, the power supply industry has been under constant pressure to bridge India's supply-demand gap for energy (see figure 1). India's Planning Commission recently projected that the country needs at least 100,000MW of new power capacity during the 12th Five year plan (2012–2017).

The government has made huge investments to increase power generation capacity through various developmental schemes, including: the Rajeev Gandhi Rural Electrification Program; 'Power for all by 2012; the Accelerated Power Development and Reform Programme (ARDRP), and the Ultra Mega Power Projects.

INDIA'S ENERGY MIX – THE ROLE OF THERMAL POWER

Thermal power accounts for over 70% of the present fuel generating capacity of India, which stands at 118,780MW today. Coal-based thermal power generation plays a dominant role in the energy supply mix – around 83% of thermal power in India is generated using coal as a raw material (see chart 1 on page 113). Of the coal produced across the country, about 70% is consumed in the power sector. The Planning Commission of India has projected that coal demand in the country to the end of the 11th plan period (2011–12) will reach 775 million tonnes, but that production will reach 672 million tonnes – a gap of 103 million tonnes. The shortfall would need to be met by importing coal and augmenting domestic coal producing capability which has led to the development of mega power projects, with 1,000MWe capacity being set up in coal regions.

ENVIRONMENTAL IMPACT OF THERMAL ENERGY

The coal relied on by thermal power stations in India, is of poor quality. Its typical 40–45% ash content adds to environmental degradation through gaseous emissions, particulate matter, fly ash and bottom ash.

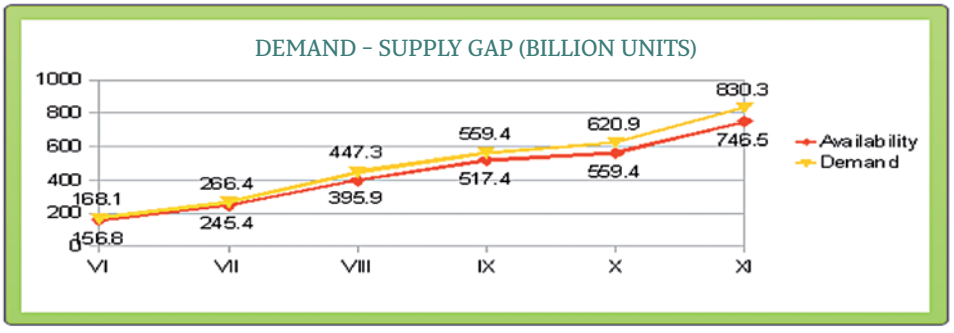


Figure 1. Source: Central Electricity Authority (CEA)

Above: 1,000MWe Jindal Power Plant: the largest single coal-based power plant in India was built by Punj Lloyd

PRODUCT PORTFOLIO - 1

TEMPORARY STRAINERS

Sizes: 3/4" (20mm) - 36" (900mm) NB
Flange Ratings: 150LB - 600LB
Flange Faces: R/F, RTJ, Full Face.
Materials: Carbon Steel, Stainless Steel, Monel, other exotic materials to customer requirements.

Y-TYPE STRAINERS

Sizes: 1/2" (15mm) - 12" (300mm) NB
Flange Ratings: 125LB - 2500LB
Line Connections: Screwed, Socket-Weld, Butt-Weld, & Flanged.
Materials: Cast Iron, Carbon Steel, Low Temp., Stainless Steel, Duplex S.S., Super Duplex S.S., 6Mo St. St., Inconel, Monel.

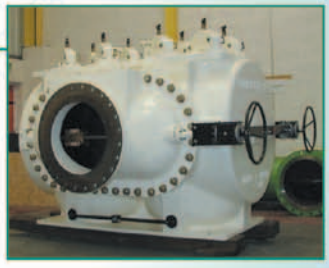
BUCKET & SIMPLEX STRAINERS

Sizes: 1" (25mm) - 24" (600mm) NB
Flange Ratings: 150LB - 2500LB
Line Connections: Butt-Weld & Flanged.
Materials: Cast Iron, Carbon Steel, Low Temp., Stainless Steel, Duplex S.S., Super Duplex S.S., 6Mo St. St., Inconel, Monel.

BATH-TUB & TEE-TYPE STRAINERS

Sizes: 2" (50mm) - 48" (900mm) NB
Flange Ratings: 150LB - 2500LB
Line Connections: Butt-Weld & Flanged.
Materials: Carbon Steel, Low Temp., Stainless Steel, Duplex S.S.

DUPLEX FILTERS



Sizes: 1" (25mm) - 30" (750mm) NB
Flange Ratings: 150LB - 300LB
Line Connections: Screwed, Butt-Weld & Flanged.
Materials: Cast Iron, Carbon Steel, Stainless Steel. Other materials on request.

- FOR ALL YOUR FILTER, STRAINER AND ARRESTER REQUIREMENTS
- WHETHER YOU REQUIRE STANDARD, CODED OR BESPOKE EQUIPMENT
- CONTACT OUR TECHNICAL SALES DEPARTMENT FOR IMMEDIATE SERVICE
- YOUR SPECIAL REQUIREMENTS BECOME OUR STANDARD!

TEL: 44 (0)1384 896159 **FAX: 44 (0)1384 424027**
E-mail: sales@gfsa.co.uk **Web site: www.gfsa.co.uk**

GFSA LTD. Gibbs Road, Lye, Stourbridge, West Midlands, DY9 8SY, United Kingdom.

FUEL BREAKDOWN OF THERMAL POWER GENERATION

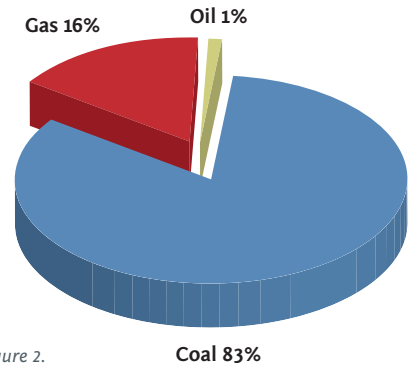


Figure 2.

Thermal power plants also cause air and noise pollution, and land degradation. The power sector is wedged between the pressure of adding new generating capacities to match the rapidly growing demand for power to achieve economic and social development, and the environmental impact of such large scale power generation.

The adoption of newer technologies which can reduce the negative effects of coal based thermal power plants are seen as a crucial part of the environmental solution. Clean coal technology offers significant reduction in environmental emission when used for power generation. This technology is very effective in reducing SOx and NOx emissions and also emits lower amounts of CO_2 per unit of power produced because of higher efficiencies.

Undeniably, coal-based thermal power generation will continue to play a dominant role in India's energy mix, until other energy sources have the capability to match production to market demand (see figure 3).

GROWTH DRIVERS FOR THE SECTOR

India, today, stands at the threshold of a boom in its power sector. According to the Integrated Energy Policy report released by the government, India's estimated energy requirements will reach approximately 950,000MW in the year 2030.

On its way to reaching that target, the government's ambitious 'Power for all by 2012' programme has projected per capita consumption of 1,000kWh by the end of the 11th Five Year Plan (2007–2012) compared to just 734kWh for the years 2008–09. These figures, and the likely pattern of growing consumption in coming years, indicate huge opportunities for energy players to meet the demand-supply gap.

Power sector reforms are seen as critical for providing the impetus to economic growth. With responsibility for electricity supply shared between the central and the state governments, the Indian goverment has placed increased emphasis on improving the efficiency of supply, consumption, and pricing of electricity. Indian states have been encouraged to undertake in-depth reforms. Work is being done to establish an independent regulatory framework for the sector, reducing subsidies and restoring the creditworthiness of the utilities through financial restructuring and cost-recovery based tariffs, and divesting existing distribution assets to private operators.

PROSPECTS FOR THE UK SUPPLY CHAIN

The UK is one of the largest exporters of generation and transmission equipment to India along with Germany, Japan and the US. Given these conditions, there are excellent prospects for British companies in energy efficient compressors, boilers, turbines, combined cycle power production, heat recovery technology, process control systems, appliances, steam systems/ generators, hydraulics, co-generation equipment, meters, sensors/controls, heating/cooling (HVAC) systems, lighting units, pumps, and related IT and energy services. As the demand for transmission and distribution equipment is expected to grow rapidly, power equipment suppliers will also find significant sales opportunities in power distribution transformers, high voltage power cables, relays, conductors, capacitors, circuit breakers and related equipment.

AT A GLANCE

DADRI POWER PLANT
Construction of a 7,480MWe combined cycle power plant. The project is to be developed in two phases. Phase one will comprise of four to five gas turbines which will generate 3,600MWe of electricity.
Value: US$5.14bn
Contract Type: EPC
Project Status: Tendering & Bidding
Startup Year: 2013
Operator: Reliance Power Ltd

ORISSA INTEGRATED STEEL AND POWER PROJECT
Planned construction of an integrated steel and power plant. The steel plant will have a finished steel making capacity of 12 million tonnes per annum and the coal-fired power plant will have 1,500MWe capacity.
Value: US$9.0bn
Contract Type: Feasibility Study
Project Status: Government/Authority Approved
Startup Year: 2013
Operator: Arcelor Mittal

GOINDWAL SAHIB POWER PLANT
Construction of a 540MWe power plant. The plant consists of two units of 270MWe and each would be fired by coal from GVK's captive mines at Tokisud North sub-block in Jharkhand.
Value: US$692m
Contract Type: EPC
Project Status: Contract Awarded
Startup Year: 2011
Contractors: Punj Lloyd (EPC); Bharat Heavy Electricals Limited (BTG)

HALDIA THERMAL POWER PLANT (PHASE I)
Construction of a new build 600MWe coal-fired power plant. The power plant will have two generators both of which will have a capacity of 300MWe.
Value: US$538m
Contract Type: EPC
Project Status: Contract Awarded
Startup Year: 2014
Operator: CESC Ltd
Contractors: Shanghai Electric Group; Punj Lloyd

ELECTRICITY GENERATION MIX, 2005–2030

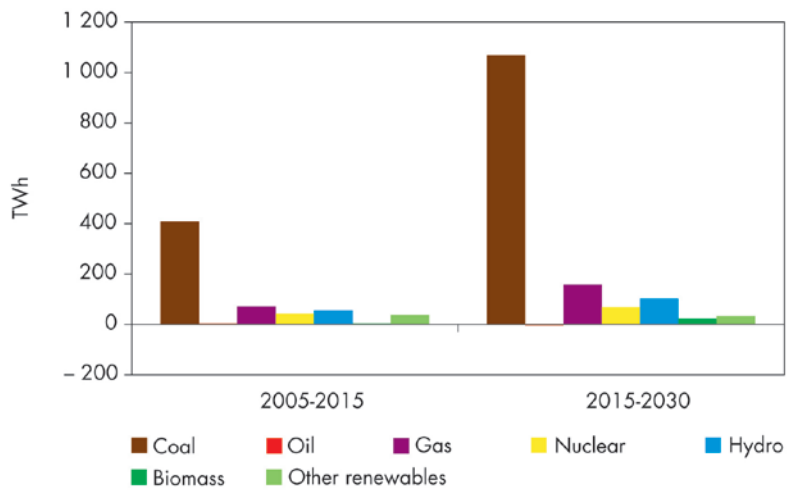


Figure 3. Source: IEA, World Energy Outlook (2007)

KEY OPPORTUNITIES

Government initiatives: Nine ultra mega power projects of 4GWe each are expected to be commissioned between 2011 and 2017, representing an investment of approximately US$4bn (£2.4bn).

Infrastructure upgrade: Meeting the rising demand for power will require an upgrading of the country's inadequate transmission and distribution network – an infrastructure which is the third largest in the world.

Encouraging FDI: 100% foreign direct investment is allowed in the generation, transmission and distribution segments of the Indian power market (FDI inflow has been on the rise for the last five years).

Public–private partnerships: have strong government support to meet the increased demand for power.