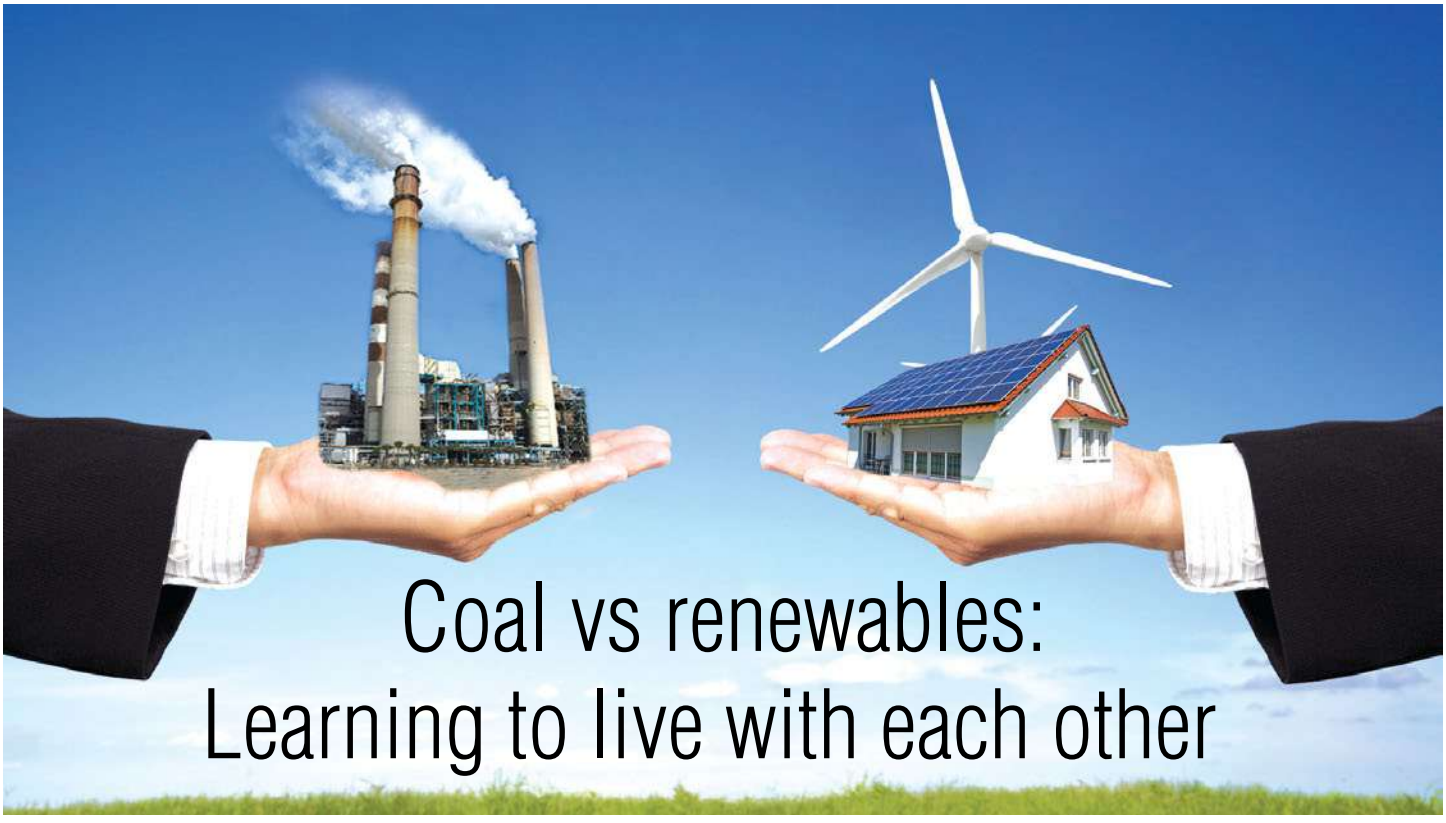

Coal vs renewables: Learning to live with each other

V K Arora

There is nothing to cheer about the financial health of the power companies. Those who have invested in mega and ultra-mega power projects based on coal are finding themselves in a serious financial crisis because of adventurous bidding.

Prices of renewables have nosedived, apparently, as a consequence of over-enthusiastic response to solar and wind projects.

Amidst the gloom, there are some encouraging stories. On May 18, 2016, Germany consumed 100 percent renewable energy against the demand of 45.8 GW on that day. The United Kingdom had no coal-fired power stations running on May 10, 2016 for 4 hours, running only on renewables. This is the shape of things to come in the future.

Against this European backdrop, in India, Tamil Nadu had generated 500 MW of wind energy for the first time in August this year while rendering the highest-ever single day generation, exceeding 100 gigawatt-hours. In order to accommodate the excess wind energy, the state had to reduce thermal generation by 50 percent. Tamil Nadu has achieved this despite the fact that 40 percent of the wind power generated was lost due to inadequate transmission capacity.

The Ministry of New & Renewable Energy has directed states to procure all electricity generated from solar and wind energy projects, even if they have to shut down their thermal power sources. This directive has not been implemented fully because there is a lack of adequate transmission capacity.

Building synergy between renewables and fossil fuels

The government has committed to provide 'Power to All' within the next 4 years. All villages are to be electrified before 2022.

An average Indian consumes a dismal 1,000 kwh of energy annually. However, per capita consumption is expected to rise at a CAGR of 8 percent. The share of renewables was at 3 percent in 2016 and is expected to rise to 8 percent by 2030.

The share of coal is presently around 55 percent and is expected to gradually go down to 52 percent by 2047. As a prelude to the climate talks in Paris, the present government set a target of 1 lakh MW for solar and 60,000 MW for wind by 2022. In order to achieve this, reverse auction was introduced to discover the best price. To their surprise, the rates of solar have fallen to around ₹2 per kwh and that of wind down to ₹2.4 per kwh.

This gives a clear signal that henceforth renewables are going to stand on their own footing rather than waiting for any subsidy.

The present and the future share of different sources of primary energy mix by 2030 is shown in the table.

Recipe for the future

State power-gencos-and discoms shall have to transform themselves. The days of subsidised power are over and all power generators will have to learn to earn within

the present pricing. The fall in prices will have to be passed on to consumers.

How to go about it

The government should make it mandatory that all new construction of offices, residential, business and factories shall install roof-top solar facilities. This has two advantages. The cost of land is nil and no transmission lines are required. AT&T losses will almost disappear.

Intermittent power generation could be taken care of with the new-generation batteries which can store power for 48 hours or even longer. Battery costs which have already fallen by around 50 percent in the past decade are expected to fall by another 60-70 percent over the next decade.

It is appreciated that there is a potential need to subsidise power to farms and slums. For this, the suggestion is to provide first 200 units of power free of cost to each farm and slum household after which the market tariffs will apply. The best way to do this is by going for decentralised cluster power generation centres which will prevent theft of power and losses. Long supply lines will be phased out, industry will no longer need to further cross-subsidise farms and slums. The power to the industry could then be obtained at below ₹5 per unit.

Share of different sopurces of primary energy mix by 2047

Share in Primary Energy Supply	2012	2022	2030	2047
Coal	47%	52%	51%	52%
Oil	27%	28%	29%	28%
Gas	8%	9%	9%	8%
Nuclear, Renewables and Hydro	3%	6%	6%	8%
Others	14%	6%	5%	5%

What are the potent dangers?

India now has a total solar capacity of 14.7 GW. Capital addition in solar has been over 7,200 MW this year. This is around 3,000 MW short of the annual target set by the ministry.

Solar projects at a bid at below ₹3 per kwh may be seriously affected by the increase in solar panel prices by 6-7 cents/watt as per ICRA. ICRA feels that the viability of the solar power projects with tariffs of lower than ₹3.5 per unit may be under a question mark.

For a wind power project with a tariff of ₹2.64 per unit, the cumulative debt service coverage ratio is estimated to be 1.1 times and IRR of less than 5 percent, assuming a capital cost of ₹7 crore per MW, PLF of 30 percent and cost of debt at 9.25 percent with a 20-year tenure. Not a very attractive return.

Coal shall continue to the mainstay for power generation to the extent of 50 percent for decades to come. For this, another estimate is that coal demand is likely to peak by 2027. The use of coal will have to be optimised by the following factors:

a) Reduction in ash,

b) Improving efficiency of combustion by using latest technology, and

c) The use of super-critical technology for combustion

Conclusion

In the end, we can predict that the power industry and the consumers of power shall have to forget about subsidies of any kind. The price of power shall be determined through market and if any subsidy has to be given, it has to be passed on to the consumer through direct benefit transfer (DBT) rather than through cheaper and subsidised power.

Wind, solar, thermal, gas and hydro, each will find its place in the Indian energy market on its own merit. Coal, with its updated technology, shall continue to be the backbone, with others playing a supplementary role. Each one of them, however, has to bring down its costs, so that it can stand on its own foot, without asking for any subsidy. This is the shape of things to come. ■

The author is a graduate in mining engineering from the Indian School of Mines, Dhanbad. While managing the operations of coal mines belonging to the erstwhile Thapar Group, he collected extensive experience in both opencast and underground mines in some of the most efficiently run units. After having worked as President and putting in 50 years of service with Karam Chand Thapar & Bros. (Coal Sales) Ltd, he is presently designated as Chief Mentor of the company. KCT has a sizeable presence in the logistics of domestic coal, handling about 70 million tons a year.

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