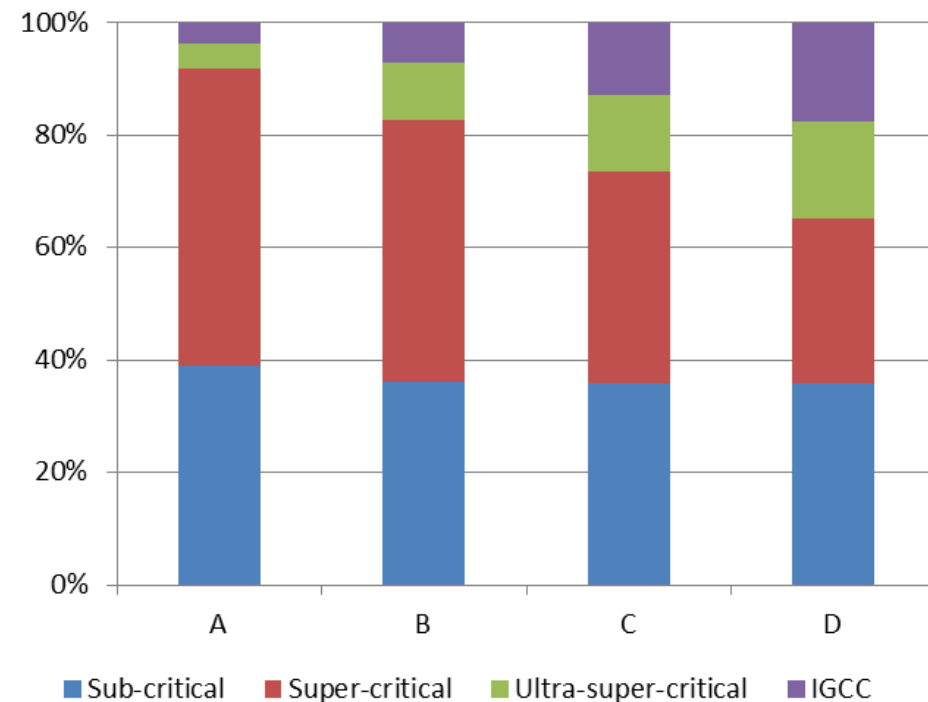


EFFICIENCY OF COAL POWER STATIONS

India's existing coal based thermal power plants (TPPs) are currently based on inefficient subcritical technology, though efforts are now being made to adopt new efficient technologies like super-critical, ultra super-critical technology etc. Super critical technology is likely to be adopted at a significant scale (38%) during the 12th Plan (2012-17). Post 2017, it is proposed that no subcritical TPPs would be allowed. However the development and deployment of these efficient technologies is sluggish due to Indian coal having high ash content and low calorific value. This analysis examines the penetration levels of efficient technology in TPPs. Based on the above, the user of this tool can estimate the quantity of coal required to meet the desired level of power supply. The factors/levers are ease of accessing technology, policy drivers, power markets and availability of high grade coal.

Shares of different technologies in 2047



LEVEL 1

New technology development/deployment will be slow. Subcritical capacity addition will stop only after 2022, ultra supercritical technology will be introduced only in 2027 and IGCC is introduced in 2037. The share of IGCC in the coal-fired capacity addition during 2042-47 would be only 30%, and its share of the total capacity in 2047 would be only 18.6 GW at level 2 capacity addition, amounting to just about 6%, while 64% of the capacity would be super-critical. Total demand for Indian grade coal in 2047 in this scenario is high at 1390 million tons.

LEVEL 2

New technology development/deployment will be slightly faster than scenario A. Subcritical plant addition will stop after 2017 as per current Government plans (Ministry of Power, 2012). Ultra supercritical technology will be commercialized after 2017 and IGCC after 2027. IGCC will contribute 50% of the capacity addition in the 18th five year plan (2042–47). The share of IGCC in the coal-fired capacity in 2047 would be 10%, and super-critical technology would have a share of 55%. Total demand for Indian grade coal in 2047 in this scenario is 1194 million tons.

LEVEL 3

New technology development/deployment will be encouraged and hence its adoption would be faster. Sub-critical capacity addition will stop after 2017, ultra-supercritical technology will be commercialized in 2022 and IGCC in 2027. IGCC's share of the capacity addition in the 18th five year plan (2042–47) would be 65%. In 2047, the share of IGCC in the coal-fired capacity would have increased to 20% and super-critical technology would have reduced to 43%. Total demand for Indian grade coal in 2047 in this scenario is 1165 million tons.

LEVEL 4

New technology development/deployment will be aggressively promoted and hence adopted very fast. Subcritical capacity addition will stop after 2017. 20% of new capacity addition in the 14th five year plan from 2022 would be ultra-supercritical technology and 20% of new capacity addition in the 15th five year plan from 2027 would be IGCC. Of the capacity addition in the 18th five year plan ending in 2047, 80% would be IGCC, resulting in its share in the total installed capacity in 2047 being 26%. Total demand for Indian grade coal in 2047 in this scenario falls to 1142 million tons.