

## Technology Options in the Cement Sector

The energy demand for Industry has been modelled on the basis of autonomous improvement in energy efficiency and technology options (process). The level of penetration of efficiency having already been adopted, now the user may choose tech option in cement, one of the two major energy consumer amongst the industrial sector (steel is the other). Four Technology options have been modelled in the cement sector. In general, the default technology option is A and other options are denoted by increasing alphabets. Increase in the alphabet of the technology option is not necessarily an indicator of emissions reduction but in general denotes reduction in energy demand (with implications on energy imports).

### A. Default

This option does not invoke specific tech options and the trajectories are based on the levels which have been chosen and the SEC reductions are based on these chosen levels.

### C. Increased Electricity from the Grid

This tech option models a major switch in the sourcing of electric power in the cement sector. Current trends show that plants are preferring to produce most of their electric power through the use of Captive Power Plants (CPP) which are largely powered by coal. This tech option provides insights into the impact of a switch to procuring most of the electric power from the grid. This assumes that the grid power would be available and would be reliable as well. Such a switch provides an improvement in the energy efficiency of the specific plant since the inefficiency of the CPP is now outside the plant boundary.

### B. Increased Waste Heat Recovery (WHR)

This option characterizes the impact of a concerted drive to increase the penetration of WHR technologies in cement plants. Such technologies are available globally, but in India, the current penetration is low. Under this tech option a large penetration of such technologies is assumed with a corresponding reduction in thermal and electrical energy used in the process.

### D. Increased Alternate Fuels and Raw Materials

This tech option is a major driver for reduction of thermal energy consumption in cement plants. European and Japanese plants are reportedly running with more than 30-50% coal being substituted by alternate fuels such as domestic, industrial and agricultural waste and used rubber tyres. The penetration of AFRM in India is probably less than 1% and thus a large potential seems to exist if the enabling infrastructure and incentives can be provided along with policy based support.