

## NUCLEAR POWER

The currently installed nuclear power generation capacity is 5,780 MW and it contributes 3% of the total electricity generation. There are 21 operating reactors in seven sites. Pressurized Heavy Water Reactors (PHWR), which use natural uranium, account for almost all of the present installed capacity. These reactors operated at PLF of 50-60% because of uranium supply bottlenecks. However, recent uranium imports have allowed the PLF to increase to 80%.

Presently, to run 9 of the 21 operating reactors, India relies on uranium imports. Uranium is assumed to be available for imports until 2047. Significant new nuclear build rates would require additional power plant locations, which is a critical factor. In the past there has been difficulty in siting these plants. This forms a vital lever in the differing numbers for growth of this source of power under the four levels.

### LEVEL 1

Level 1 assumes that the present reactors under construction (4,300 MW) are completed and commissioned. This will take the cumulative nuclear capacity to 9,980 MW by the end of Twelfth Plan. However, the present public sentiment regarding nuclear power results in limited capacity addition in nuclear power, while a few of the older reactors get decommissioned. Thus, the cumulative nuclear power capacity reaches only about 11,360 MW by 2047. The electricity generated would rise to 79.7 TWh in 2047 from 26.7 TWh in 2012.

### LEVEL 2

Level 2 assumes that new reactors are developed on the eight new sites identified. The government's in principle approval exists for setting up 700 MW PHWR reactors in five sites, leading to 8,400 MW of capacity addition in this technology. Further, Light Water Reactors (LWRs) are built on four sites. Also, two more Fast Breeder Reactors (FBRs) with a total capacity of 1,000 MW are commissioned. Thus, the total nuclear capacity reaches 26,110 MW by 2047. The corresponding electricity generated in 2047 would be 183.1 TWh.

### LEVEL 3

Level 3 assumes that all the new PHWR sites are fully utilized with new reactors. Six reactors are assumed per site. In addition, the spent fuel from thermal reactors is used to build 2,500 MW FBR. Thus, new reactors are developed taking the installed capacity to 45,010 MW by 2047 and the electricity generated would be 315.6 TWh.

### LEVEL 4

Over and above Level 3, this highly optimistic scenario assumes that three new sites are identified, which can accommodate about 15,000 MW through new PHWRs and LWRs. Further, up to 4,500 MW of FBRs are developed. In this scenario, the nuclear capacity reaches 78,060 MW by 2047. The corresponding electricity generation in 2047 would be 547.4 TWh.

