NUCLEAR POWER STATIONS

The currently installed nuclear power generation capacity is 4,680 MW and it contributes 3% of the total electricity generation[2]. There are 22 reactors at 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 78%. Presently, to run 9 of the 20 operating reactors, India relies on Uranium imports. Assured Uranium imports are assumed until 2050 and beyond. Significant new nuclear build rates would require additional power plant locations, which is a critical factor. This forms a vital lever in the differing numbers for growth of this source of power under the 4 Levels.

Level 1

Level 1 assumes that the present reactors under construction (5,300 MW) are completed and commissioned. This will take the cumulative nuclear capacity to 9,980 MW by the end of 12th Plan[3]. However, the present public sentiment regarding nuclear power prohibits the construction of more nuclear power plants in India. The existing reactors continue to be operated till their lifetime. A few of the older reactors get decommissioned. Thus, the nuclear power capacity drops to about 8.4 GW by 2047.

Level 2

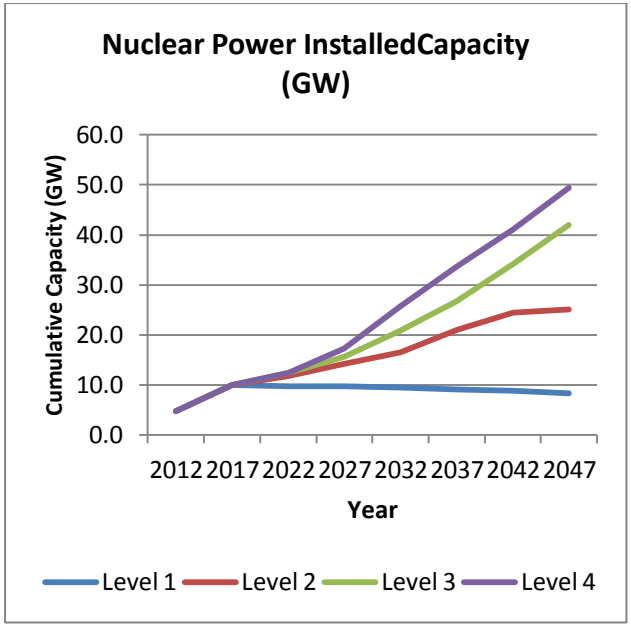
Level 2 assumes that new reactors are developed in the eight new sites identified. The government's in principle approval exists for setting up 700 MW reactors in five sites[4]. In addition, two more Fast Breeder Reactors (FBRs) with a total capacity of 1,500 MW are commissioned. Thus, 19,900 MW of new nuclear capacity is added taking the total to 25.1 GW by 2047.

Level 3

Level 3 assumes that all the new 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 5,500 MW FBR. Thus, new reactors are developed taking the installed capacity to 42 GW by 2047.

Level 4

This assumes that three new sites are identified, which can accommodate about 15,000 MW through new PHWRs and LWRs. Further, up to 30,000 MW of FBRs are developed. There appears to be no public resistance for siting of these plants at new locations. In this scenario, the nuclear capacity reaches 49.4 GW by 2047.



Note: Please see detailed documentation for references.