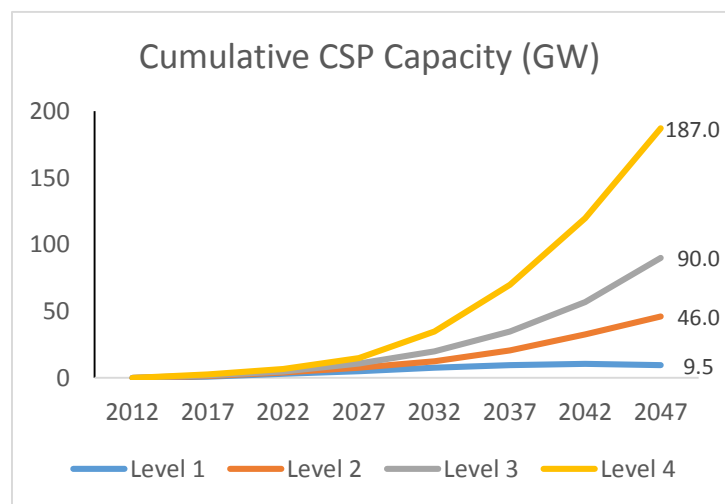


CONCENTRATED SOLAR POWER (CSP)

It was the JNNSM that kick started the CSP program in India. Under the phase 1 (2010-13) of the mission, 50% of the allotted capacity was earmarked for CSP. A total of 470 MW were bid out. The first large scale plant of 50 MW was commissioned very recently in the country. Phase 2 of the mission (2013-17) has earmarked roughly 30% of the capacity for CSP. Going beyond the JNNSM, the National Tariff Policy was amended (2011) to have a separate solar RPO (PV+CSP) for all obligated entities. This is expected to (began with 0.25% in 2012) increase to 3% in 2022. According to MNRE, this translates to a need of roughly 34,000 MW in 2022. With reduction in cost of technology and the storage benefit, CSP can contribute a significant portion to the RE share. While CSP is presently costlier than PV, its ability for storage and supporting the grid with ancillary services is of value. Similarly CSP also allows the possibility of hybrid plants with natural gas or coal.



LEVEL 1

Level 1 assumes that only 1 GW would be operational in the next 5 years (mainly due to higher costs) beyond which there will be slight increase in generation capacity reaching a maximum of 9.5 GW by 2047. Deployment increases slowly till 2032 after which it starts reducing. After 2042 there is no additional deployment. The cumulative capacity in 2047 would be 9.5 GW and generation would be 35 TWh.

LEVEL 2

Level 2 assumes that there is slow but consistent growth in capacity addition of CSP. It reaches 4 GW by 2022, i.e. 20% of the total JNNSM target for grid connected solar. The final capacity in this level in year 2047 is 46 GW resulting in a generation of 181 TWh.

LEVEL 3

Level 3 assumes that CSP costs come down significantly and that there are no limitations on plant size etc. Improved transmission and HVDC lines together, result in faster capacity addition. 10.8 GW is reached by 2027 increasing thrice to 34 GW in the next ten years and culminating in 90 GW by 2047. Generation by 2047 reaches 357 TWh.

LEVEL 4

Solar CSP becomes one of the prime sources of electricity generation; extended storage facility helps CSP reach maximum potential. Costs of solar system and storage fall as higher temperature technologies are introduced. Supply grows rapidly meeting the NAPCC targets by 2020 resulting in a capacity of 6.7 GW by 2022 and 187 GW in 2047, a CAGR of 15% over 30 years. Generation by 2047 reaches 746 TWh.