Gas Power Stations

Development of gas-based power generation in Tamil Nadu started way back in 1990s. By year 2000, total installed capacity of gas-based power plants in Tamil Nadu was 120 MW which included Basin Bridge gas-based station. In the last fifteen years (from 2000 to 2015), installed capacity of gas-based power plants have increased to 1 GW. However, most of these power stations are operating at a very low plant load factor due to non-availability of gas. This is expected to change with establishment of R-LNG plant at Ennore. The present analysis deals with grid connected gas-based plants and how they will grow under different scenarios. It is expected that gas-based power will be vital, not only to meet peaking demand but also to balance intermittent generation from renewable energy sources. Further in all the four levels, it is assumed that existing plants which are under construction will be commissioned as per plan.

Level 1

Level 1 assumes that no new gas units are built, and the retiring units are replaced. The PLF of gas plants will improve to 55% in 2050 due to R-LNG plant at Ennore The total installed capacity will remain 1 GW as replacements for retiring plants are built. It is assumed that gas plants will generate 4.9 TWh by 2050.

Level 2

R-LNG plant at Ennore improves gas availability and PLF will improve to 60% by 2050. There will be an increase in the total installed capacity with addition of 2 X 730 MW plants, with total installed capacity reaching up to 2.5 GW. This will result in increase in electricity generation to 13 TWh in 2050.

Level 3

Level 3 assumes a higher growth in installation of gas-based power plants with a third 730 MW unit being built because of increase in fuel availability, improved gas infrastructure, and need for balancing power to manage renewable generation. Total installed capacity will reach 3.2 GW by 2050 and plant load factor will also improve and reach up to 65% in 2050. Further, due to technological advancements conversion efficiency will improve to about 64% by 2050, resulting in electricity generation of 18.2 TWh by 2050.

Level 4

Level 4 is a more aggressive scenario wherein a third 730 MW unit is commissioned by 2045. Total installed capacity will reach up to 3.2 GW by 2050 and plant load factor will also improve significantly reaching to 70% in 2050. This will result in increase in generation from gas-based power plant to 19.7 TWh in 2050.