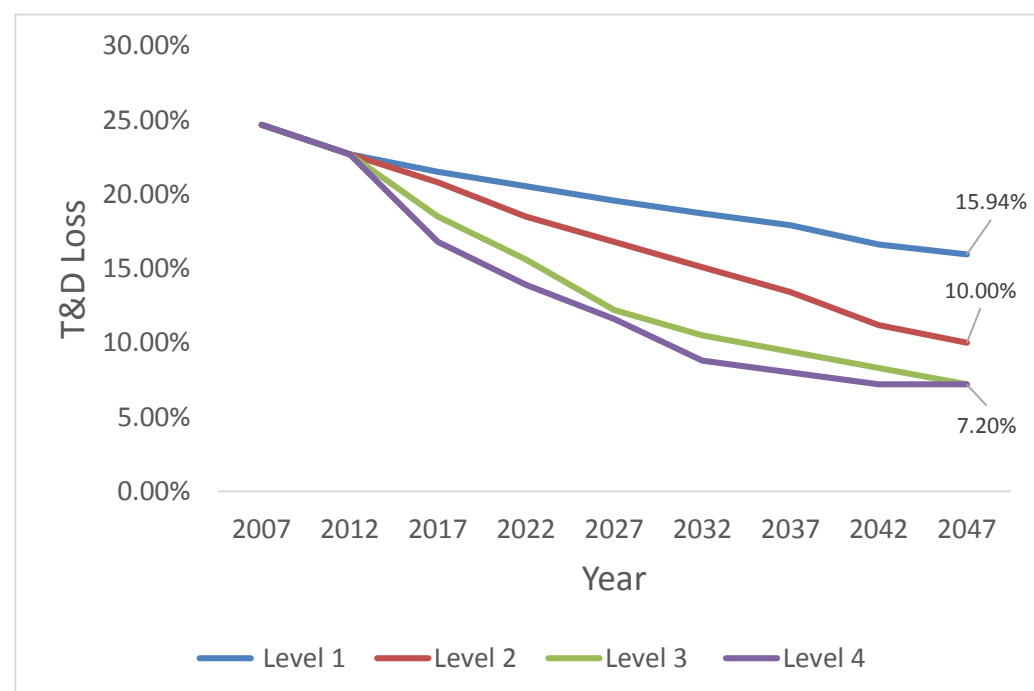


## T&D Losses and Smart Grids

T&D losses in India are one of the highest in the world. With an objective to reduce distribution losses and strengthen the distribution sector, Ministry of Power has launched several programmes such as APDRP, R-APDRP, and National Smart Grid Mission etc. A change in the Electricity Act, 2003 is also envisaged to improve the business structure towards this end – separation of carriage and content.

The present analysis captures electricity savings under different scenarios of T&D losses from the present losses of 22.7% until global best performance in Level 4 in 2047. Commercial losses are not captured herein, as they do not impact electricity availability/consumption.



### LEVEL 1

Only a marginal improvement in T&D losses is assumed, which is currently at 22.69% on all India basis as of May 2013. Owing to financial losses of distribution utilities, investments towards strengthening the grid are minimal and hence the reduction in T&D losses would not be significant and will only reduce to 15.94% till 2047 out of which distribution losses will be 10.94% and transmission loss will reduce to 5%.

### LEVEL 2

Although the 14 Smart Grid pilot projects demonstrate the benefits of Smart Grid technologies at the pilot scale, a pan India large-scale deployment of Smart Grid technologies is assumed to happen at a relatively low rate. Projecting based on conservative estimates of leveraging the Smart Grid technologies T&D losses would reduce to approximately 11% by 2042 and will further reduce to 10% till 2047 out of which transmission loss will be 4% and distribution loss will be 6% by 2047.

### LEVEL 3

It is assumed that the investments are made as envisaged in the India Smart Grid Roadmap<sup>1</sup>, towards achieving the stated goals of reduction in losses, demand response and integration of renewable energy. Building on the success of the pilot projects, various technologies are leveraged under a clean energy policy drive to achieve a financially viable and sustainable Smart Grids. The T&D losses would reduce to below 12% by 2027 out of which distribution losses will be 7% and transmission losses will be 5% and would reach around the global benchmark of 7% by 2047 of which transmission losses will be 3% and distribution losses will be 4%.

### LEVEL 4

An aggressive drive is adopted by the dynamic 21st century India, towards achieving sustainable economic growth, energy independence and energy security. Reforms in the transmission and distribution sectors are carried out via elimination of cross-subsidies, innovative and competitive tariff structures, increased private participation in electricity business, electric vehicles, real-time energy markets, bi-directional flow of electricity and prosumer enablement. The global benchmark of 7% T&D losses is achieved by 2042 of which transmission losses will be 3% and distribution losses will be 4% and maintained thereafter till 2047.