30. Domestic buildings: Urban: Lighting and appliances

The growth in ownership and usage of electrical appliances and lights is a strong indicator of a country's economic development. At the same time, usage can expand beyond needs into wasteful (leaving lights on or air conditioning an empty room). This lever explores the effect of using public education and efficiency drives to reduce demand while still satisfying consumerist growth.

The last decade

Energy use in urban Bangladesh has increased considerably, limited only by the building out of the national grid capacity. Fridges and TVs are spreading quickly, while cheap labor still takes the role of items like washing machines.

Assumptions of model

The model uses logistic curves and limited historical data to predict the average ownership rates of different key appliances with time. For most of these appliances, a fully saturated ownership does not occur within the time frame of the model (an example of fully saturated might be 1 TV per person, a level most of the western world has not yet reached). To account for the affect of GDP on appliance ownership levels, a simple multiplier factor is applied to increase the final electricity demand above the basic rate estimated. This covers both additional appliances or more time spent using existing ones. Slums are modeled with a lower appliance ownership rate then other urban houses.

Levels

Level 1

Business as usual, there is no reduction of demand from public education. 35% of bulbs are CFL or better. By 2050,

Level 2

By 2050, public education will reduce urban electricity demand by 18%. 30% of bulbs are CFL or better (fluorescents replace incandescents).

Level 3

By 2050, public education will reduce urban electricity demand by 33%. 70% of bulbs are CFL or better.

Level 4

By 2050, public education will reduce urban electricity demand by 59%. 90% of bulbs are CFL or better.

Interaction with other levers

GDP is used to set the electricity demand multiplier, the population lever controls the number of households and the 'access to the grid' lever controls the proportion of households that will start acquiring appliances.

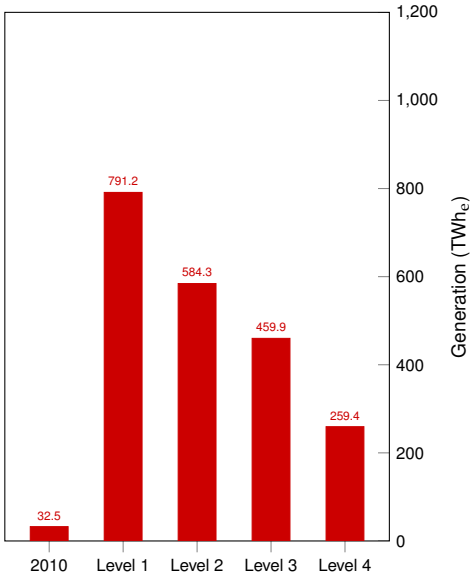

Figure 30.1: Projected in 2050,

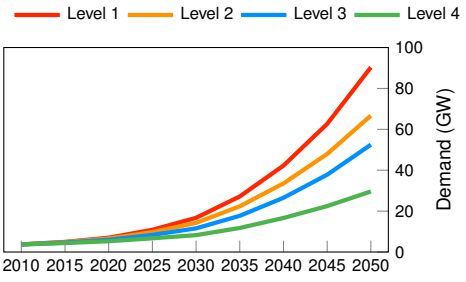

Figure 30.2: Development of capacity for a medium population and moderate GDP

Figure 30.3: Dhaka, Bangladesh