31. Domestic buildings: Rural: 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

The primary source of energy use in rural Bangladesh continues to be biomass driven by cooking. The development of LED lighting and SHS have brought limited electrical benefits to many families. The electrical grid is also being expanded, adding more settlements who in turn can now make use of grid electricity to power appliances.

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.

Levels

Level 1

Business as usual. There is no reduction in demand due to public education. 35% of bulbs are CFL or better.

Level 2

By 2050, public education will reduce rural electricity demand by 9%. 30% of bulbs are CFL or better.

Level 3

By 2050, public education will reduce rural electricity demand by 16%. 70% of bulbs are CFL or better.

Level 4

By 2050, public education will reduce rural electricity demand by 30%. 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.
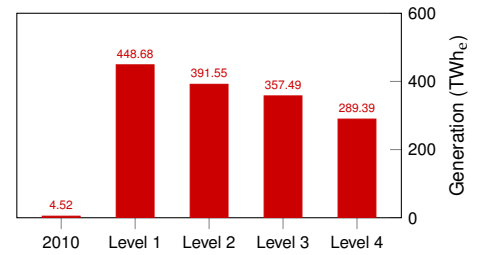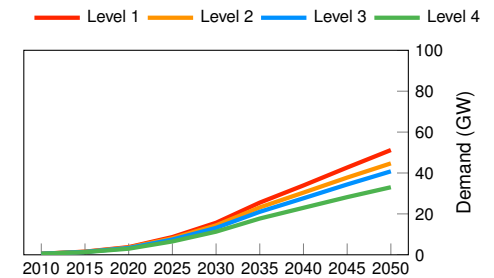

Figure 31.1: Projected in 2050,

Figure 31.2: Development of capacity for a moderate GDP and medium population setting

Figure 31.3: An example of rural housing, Bangladesh