35. Commercial buildings: Lighting and appliances

This lever allows the user to investigate the impact of appliance and lighting of non-domestic buildings: office space, hospitals, restaurants ect.

The last decade

The percentage of the population employed in the service sector has remained constant for the last decade. The nature of the work is changing, with more people working for large companies in retail, restaurants or offices and other desk jobs. Computers are quickly becoming ubiquitous, and hours worked less limited to daylight hours.

Assumptions of model

Appliances are assigned based on a unit per worker basis. An office may have a computer for every worker, while a hotel has one computer for every 200 staff. Lighting is based on floor area and lighting requirements for that job.

Levels

Level 1

Energy demand for lighting and appliances increases 298% by 2050. 35% bulbs are CFL or better. 10% heating is electric, 0% is solar. 10% of kitchens are electric.

Level 2

Energy demand for lighting and appliances increases 220% by 2050. 30% bulbs are CFL or better. 40% heating is electric, 40% is solar. 30% of kitchens are electric.

Level 3

Energy demand for lighting and appliances increases 171% by 2050. 70% bulbs are CFL or better. 60% heating is electric, 30% is solar. 60% of kitchens are electric.

Level 4

Energy demand for lighting and appliances increases 122% by 2050. 90% bulbs are CFL or better. 19% heating is electric, 80% is solar. 90% of kitchens are electric.

Interaction with other levers

Appliance usage in office settings is a significant source of heat. Setting this lever to level 1 and setting the Commercial Air Conditioning lever to 4 may be contradictory.
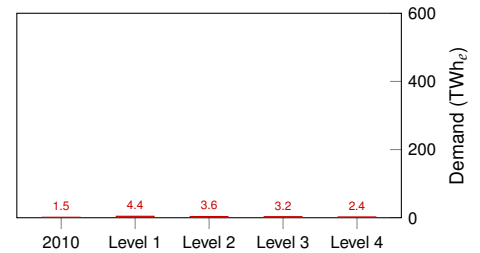

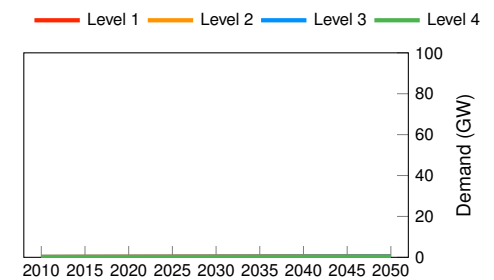Figure 35.1: 2050 Lighting and Appliance electricity demand

Figure 35.2: Development of demand by scenario

Figure 35.3: A commercial office building, Bangladesh