Buildings: Temperature

This lever controls the sub-levers listed in the table, and ambition levels are for the end year shown on the right-hand side. Units of 'Index' are relative to 2015.

The average internal temperature of homes in 2015 was 18.7°C compared to 16°C in 1990. People have tended to increase the temperature to which they heat their homes. Very few homes currently have air conditioning (AC). In 2015, the average annual demand for domestic hot water (HW) was about 700kWh/person, which is approximately equivalent to 40L of water heated from 10°C to 50°C per person per day.

Demand for space heating in non-domestic buildings was 160 kWh/m^2 in 2015. Demand for non-domestic HW was 15 kWh/m^2 in 2015. Most non-domestic buildings have some form of cooling, the demand for which was 50 kWh/m^2 in 2015.

Potential for lowering internal building temperatures is limited by public acceptance and the adoption and usage of smart heating controls.

Key Interaction

Reducing demand for heat directly reduces the energy supply requirement.

Level 1

The average internal temperature in homes increases by about 0.5°C per decade to 20°C by 2050. Increased water consumption with no effort to reduce water temperatures leads to an increase in HW demand.

By 2050, AC use in homes exceeds levels seen in the Mediterranean today (30%). All non-residential floorspace is cooled.

Level 2

In residential buildings internal temperature roughly follows today's level as does HW demand. AC/cooling demand decreases linearly from Level 1 to Level 4.

Level 3

Ambition levels decrease internal temperature and HW demand linearly. AC/cooling demand decreases linearly from Level 1 to Level 4.

Level 4

Internal temperature in homes approaches the limit set by the World Health Organization (WHO) of 16°C. This is achieved by smart controls and acceptance of reduced comfort. Heat recovery technologies and shift in behaviour allows deep reductions in HW demand.

Behavioural changes and technological solutions (passive dwelling design and heat shedding) mean homes no longer need AC, and lead to a reduction in the cooling demand for non-residential buildings.

Default Timing

Start year: 2020, End year: 2050

Sub-Lever	Units	2015	Level 1	Level 2	Level 3	Level 4
Residential Dwellings						
Internal temperature	°C	18.7	20.0	18.0	17.0	16.0
HW Demand / Person	Index	1.00	1.43	1.03	0.77	0.51
Homes with AC	share	1%	50%	33%	17%	0%
Non-Residential Buildings						
SH Demand / Area	Index	1.00	1.50	1.35	1.08	0.80
HW Demand / Area	Index	1.00	1.50	1.42	1.25	0.90
Cooling Demand / Area	Index	1.00	2.41	1.60	1.07	0.56

HW = Hot Water; SH = Space Heat