Schools

Operational energy

Implement the following indicative design measures:

Fabric U-values (W/m².K)

Walls	0.13 - 0.15
Floor	0.09 - 0.12
Roof	0.10 - 0.12
Windows	1.0 (triple glazing)
Doors	1.2

Fabric efficiency measures

Air tightness	<1 (m^3/h. m^2@50Pa)
Thermal bridging	0.04 (y-value)
G-value of glass	0.5 - 0.4

Power efficiency measures

Lighting power density	4.5 (W/m^2 peak NIA)
Lighting out of hours	0.5 (W/m^2 peak NIA)
Small power out of hours	2 (W/m^2 peak NIA)

System efficiency measures

MVHR	90% (efficiency)
Heat pump SCoP	≥ 2.8
Central AHU SFP	1.5 - 1.2 W/l.s

Maximise renewables so that 70% of the roof is covered

Window areas guide (% of wall area)

North	15-25%
East	15-25%
South	15-25%
West	15-25%

Balance daylight and overheating

Include external shading

Include openable windows and cross ventilation

Form factor of 1 - 3

Reduce energy consumption to:

65 kWh/m^2.yr

Energy Use Intensity (EUI) in GIA, excluding renewable energy contribution

Reduce space heating demand to: **15** kWh/m^2.yr

Heating and hot water

Implement the following measures:

Fuel

Ensure heating and hot water generation is fossil fuel free

Heat

The average carbon content of heat supplied (gCO_2/kWh.yr) should be reported in-use

Heating

Maximum 10 W/m^2 peak heat loss (including ventilation)

Hot water

Maximum dead leg of 1 litre for hot water pipework

'Green' Euro Water Label should be used for hot water outlets (e.g.: certified 6 L/min shower head – not using flow restrictors).

Demand response

Implement the following measures to smooth energy demand and consumption:

Peak reduction

Reduce heating and hot water peak energy demand

Active demand response measures

Install heating and cooling set point control

Reduce lighting, ventilation and small power energy consumption

Electricity generation and storage

Consider battery storage

Electric vehicle (EV) charging

Electric vehicle turn down

Reverse charging EV technology

Behaviour change

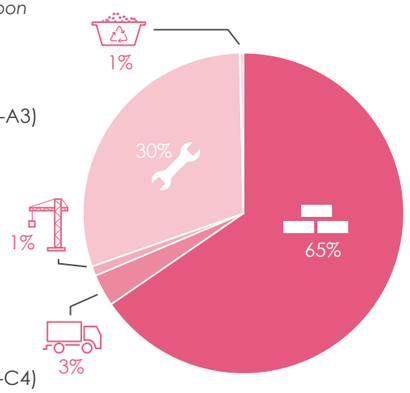
Incentives to reduce power consumption and peak grid constraints

Encourage responsible occupancy.

Embodied carbon

Focus on reducing embodied carbon for the largest uses:

- Products/materials (A1-A3)
- Transport (A4)
- Construction (A5)
- Maintenance and replacements (B1-B5)
- End of life disposal (C1-C4)



Average split of embodied carbon per building element:

- **30%** - Superstructure
- **21%** - Internal finishes
- **16%** - Substructure
- **16%** - Façade
- **13%** - MEP

Reduce embodied carbon by 40% or to: **<600** kgCO_2/m^2

Area in GIA

Data disclosure

Meter and disclose energy consumption as follows:

Metering

(Metering strategy following BBP Better Metering Toolkit guidance)

1. Record meter data at half hourly intervals
2. Clearly label meters with serial number and end use
3. Submeter renewable energy generation
4. Use a central repository for data that has a minimum of 18 months data storage
5. Provide thorough set of meter schematics and information on maintenance and use of meters
6. Ensure metering commissioning includes validation of manual compared to half hourly readings.

Disclosure

1. Carry out an annual Display Energy Certificate (DEC) and include as part of annual reporting
2. Report energy consumption by fuel type and respective benchmarks from the DEC technical table
3. Upload five years of data to a publicly accessible database such as GLA and/or CarbonBuzz. Include information about the building (do not anonymise).

LONDON ENERGY TRANSFORMATION INITIATIVE