Medium and large scale housing

Operational energy

Implement the following indicative design measures:

Fabric U-values (W/m².K)

Walls	0.13 - 0.15
Floor	0.08 - 0.10
Roof	0.10 - 0.12
Exposed ceilings/floors	0.13 - 0.18
Windows	1.0 (triple glazing)
Doors	1.00

Efficiency measures

Air tightness	<1 (m³/h.m²@50Pa)
Thermal bridging	0.04 (y-value)
G-value of glass	0.6 - 0.5
MVHR	90% (efficiency) ≤2m (duct length from unit to external wall)

Maximise renewables so that 70% of the roof is covered

Form factor of <0.8 - 1.5

Window areas guide (% of wall area)

North	10-20%
East	10-15%
South	20-25%
West	10-15%

Balance daylight and overheating

Include external shading

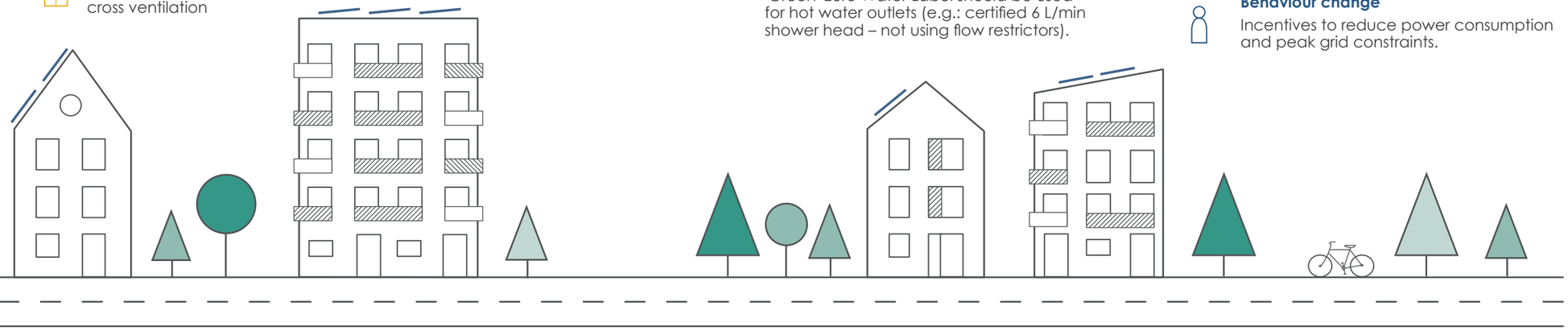
Include openable windows and cross ventilation

Reduce energy consumption to:

35 kWh/m².yr

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

Reduce space heating demand to: 15 kWh/m².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/m² 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 set point control and thermal storage

Electricity generation and storage
Consider battery storage

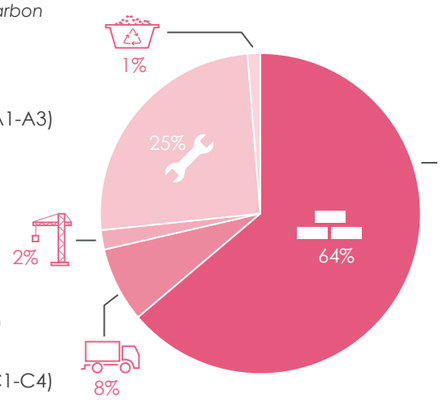
Electric vehicle (EV) charging
Electric vehicle turn down

Behaviour change
Incentives to reduce power consumption and peak grid constraints.

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:

46% - Superstructure

21% - Substructure

16% - Internal finishes

13% - Façade

4% - MEP

Reduce embodied carbon by 40% or to:

<500 kgCO₂/m²

Area in GIA

Data disclosure

Meter and disclose energy consumption as follows:

Metering

1. Submeter renewables for energy generation
2. Submeter electric vehicle charging
3. Submeter heating fuel (e.g. heat pump consumption)
4. Continuously monitor with a smart meter
5. Consider monitoring internal temperatures
6. For multiple properties include a data logger alongside the smart meter to make data sharing possible.

Disclosure

1. Collect annual building energy consumption and generation
2. Aggregate average operational reporting e.g. by post code for anonymity or upstream meters from part or whole of apartment block
3. Collect water consumption meter readings
4. Upload five years of data to GLA and/or CarbonBuzz online platform
5. Consider uploading to Low Energy Building Database.

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