

APPENDIX 4 CALCULATING THE 10% REQUIREMENT

See Section 7 for detailed guidance on how to undertake the calculations.

Stage 1. Work out the annual CO₂ emissions of the buildings

Complete either calculations 1, 2, 3 or 4

1. Calculations where there is no Standard Assessment Procedure or Simplified Building Energy Model data

Where there is more than one type of building you will need to undertake this calculation separately for each building type.

Building type 1:

luxury hotel

$$\begin{aligned} &\text{Annual benchmark CO}_2 \text{ emissions per} \\ &\text{m}^2 \text{ (a)} \quad 96.3 \quad \text{kgCO}_2/\text{yr} \\ &\quad \times \text{ floor area (b)} \quad 425 \quad \text{m}^2 \\ &= \text{annual CO}_2 \text{ emissions (c)} \quad 40927 \quad \text{kgCO}_2/\text{yr} \end{aligned}$$

Building type 2:

swimming pool

$$\begin{aligned} &\text{Annual benchmark CO}_2 \text{ emissions per} \\ &\text{m}^2 \text{ (a)} \quad 219.8 \quad \text{kgCO}_2/\text{yr} \\ &\quad \times \text{ floor area (b)} \quad 200 \quad \text{m}^2 \\ &= \text{annual CO}_2 \text{ emissions (c)} \quad 44000 \quad \text{kgCO}_2/\text{yr} \end{aligned}$$

Building type 3:

sports facility

$$\begin{aligned} &\text{Annual benchmark CO}_2 \text{ emissions per} \\ &\text{m}^2 \text{ (a)} \quad 73.5 \quad \text{kgCO}_2/\text{yr} \\ &\quad \times \text{ floor area (b)} \quad 660 \quad \text{m}^2 \\ &= \text{annual CO}_2 \text{ emissions (c)} \quad 48510 \quad \text{kgCO}_2/\text{yr} \end{aligned}$$

$$\text{Total CO}_2 \text{ emissions (c) + (c) + (c) = (d) } 133437 \text{ kgCO}_2/\text{yr}$$

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OR

2. Annual CO₂ emissions from SAP assessment

CO₂ emissions (d) kgCO₂/yr

OR

3. Annual CO₂ emissions from SBEM assessment

CO₂ emissions (d) kgCO₂/yr

OR

4. Annual CO₂ emissions from Act on CO₂ website

CO₂ emissions (d) kgCO₂/yr

Stage 2. Work out 10% of the annual CO₂ emissions

10% of CO₂ emissions ((d)/100) x 10 = (e) 13 343.7 kgCO₂/yr

Stage 3. Select the renewable technology (or technologies) you wish to incorporate and work out the annual CO₂ savings

Electricity generating technologies

pv 10000.	Electricity generating renewable energy (f) 10 000 kWh/yr
	x 0.422 ²¹ (g) 4220 kgCO ₂ /yr

Heat generating technologies

bio mass	Heat generating renewable energy (h) 260 000 kWh/yr
	x 0.194 or x 0.265 ²² (i) 50 440 kgCO ₂ /yr

²¹ Standard conversion factor for kWh electricity to kgCO₂

²² Standard conversion factors - use x 0.194 if displacing gas or x 0.265 if displacing oil

Total CO₂ savings (g) + (i) = (j) 54 660 kgCO₂/yr

Stage 4. Check that your chosen technology will provide enough CO₂ savings

(j) should be equal to or greater than (e) to ensure that at least 10% of predicted CO₂ emissions are offset through renewable energy.

% of CO₂ emissions which will be offset
by renewable energy (j) / (d) 40.56 %

If this figure is less than 10%, look at increasing the size / capacity of the installation, try other technologies or look at using a mix of technologies.

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