14 CO_2 EMISSIONS ASSOCIATED WITH APPLIANCES AND COOKING AND SITE-WIDE ELECTRICITY GENERATION TECHNOLOGIES

SAP calculations may be extended to allow for CO_2 emissions associated with appliances and cooking, and to allow for site-wide electricity generation technologies*.

Where the DER for the dwelling is ≤ 0.00 the dwelling can be assessed for net CO_2 emissions by the following procedure.

		kg/m²/year	
DER	(113) or (120*) =		(ZC1)
CO_2 emissions from appliances and cooking			(ZC2)
Total CO_2 emissions	(ZC1) + (ZC2) =		(ZC3)
CO_2 saving from additional low-energy lights and omission of secondary heating *(where applicable)*			(ZC4)
Residual CO_2 emissions offset from biomass CHP *value at (115*) before setting (115*) to zero, where applicable, divided by total floor area of dwelling*			(ZC5)
Additional allowable electricity generation, kWh/m²/year			(ZC6)
Resulting CO_2 emissions offset from additional allowable electricity generation	-(ZC6) × EF =		(ZC7)
Net CO_2 emissions	(ZC3) + (ZC4) + (ZC5) + (ZC7) =		(ZC8)

Box (ZC2) is calculated as $[99.9 \times (TFA \times N)^{0.4714} - 3.267 \times TFA + 32.23 \times N + 72.65]/TFA$
where:

TFA is the total floor area as in box (5);
if TFA < 43, N = 1.46;
if TFA ≥ 43, $N = 2.844 \times (1 - \exp(-0.00039) \times TFA^2)$.

Box (ZC4) is the difference between the CO_2 emission rate at (113) or (120*) for the DER calculation (following the rules for compliance with building regulations) and for the SAP calculation. This adjusts the CO_2 emission rate to that applying with low-energy lights as specified for the dwelling and without secondary heating if no secondary heater is specified. Note that assessment of the DER must first be done with low-energy lights and secondary heating as specified for the DER calculation and without any residual offset for biomass CHP.

EF for the calculation of (ZC7) is the CO_2 emission factor in Table 12 for electricity displaced from grid (kg/kWh).

The entries in (ZC4) , (ZC5) and (ZC7) are negative quantities.

Additional allowable electricity generation for box (ZC6) includes electricity generated by:

wind generators
photovoltaic panels
hydro-electric generators

where these generators conform with applicable rules and regulations for the purpose of the calculation and not already included at (95) or (95*). For further details see Appendix M. The electricity generated in kWh/year is divided by the total floor area of buildings on the development to obtain the value for (ZC6).

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* The introduction of this calculation procedure is in support of limitation of or exemption from Stamp Duty Land Tax for zero carbon homes as defined in regulations made under sections 58B and 58C of Finance Act 2003. Future legislation may define a zero carbon home or dwelling in a different way and for that reason a definition of zero carbon home is omitted from the SAP document.