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Energy lost from water storage, kWh/year	$(41) \times (41a) \times 365 =$	N/A	(42)

b) If manufacturer's declared cylinder loss factor is not known:

Cylinder volume (litres) including any solar storage within same cylinder	300.00	(43)

If community heating and no tank in dwelling, enter 110 litres in box (43)
Otherwise, if no stored hot water (this includes instantaneous combi boilers), enter '0' in box (43)

Hot water storage loss factor from Table 2 (kWh/litre/day)	0.01	(44)

If community heating and no tank in dwelling, use cylinder loss from Table 2 for 50 mm factory insulation in box (44)

Volume factor from Table 2a		0.74	(44a)
Temperature factor from Table 2b		0.54	(44b)
Energy lost from water storage, kWh/year	$(43) \times (44) \times (44a) \times (44b) \times 365 =$	503.10	(45)
Enter (42) or (45) in box (46)		503.10	(46)
If cylinder contains dedicated solar storage, box (47) = (46) × [(43) - (H11)] / (43), else (47) = (46)		251.55	(47)
Primary circuit loss from Table 3		360.00	(48)
Combi loss from Table 3a (enter "0" if no combi boiler)		0.00	(49)
Solar DHW input calculated using Appendix H (enter "0" if no solar collector)		570.85	(50)
Output from water heater, kWh/year	$(39)+(40)+(47)+(48)+(49)-(50) =$	1835.55	(51)
Heat gains from water heating	$0.25 \times [(39)+(49)]+0.8 \times [(40)+(47)+(48)] =$	1086.02	(52)

include (47) in calculation of (52) only if cylinder is in the dwelling or hot water is from community heating

5. Internal gains

		Watts	
Lights, appliances, cooking and metabolic (Table 5)		363.54	(53)
Reduction of internal gains due to low energy lighting (calculated in Appendix L)		22.27	(53a)
Additional gains from Table 5a		17.57	(53b)
Water heating	$(52) \div 8.76 =$	123.98	(54)
Total internal gains	$(53) + (53b) + (54) - (53a) =$	482.81	(55)

6. Solar gains

	Access factor Table 6d		Area m²		Flux Table 6a		g Table 6b		FF Table 6c	Gains (W)	
East	0.77	×	7.56	×	48.00	x 0.9 x	0.63	×	0.70	=	110.90	(59)

Total solar gains:	$[(56) + \dots + (64)] =$	110.90	(65)

Note: for new dwellings where overshading is not known, the solar access factor is '0.77'

Total gains, W	$(55) + (65) =$	593.71	(66)

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Gain/loss ratio (GLR)	$(66) \div (37) =$	13.79	(67)
Utilisation factor (Table 7, using GLR in box (67))		0.73	(68)
Useful gains, W	$(66) \times (68) =$	432.80	(69)

7. Mean internal temperature

°C

Mean internal temperature of the living area (Table 8)		18.88	(70)
Temperature adjustment from Table 4e, where appropriate		0.00	(71)
Adjustment for gains	$\{[(69) \div (37)] - 4.0\} \times 0.2 \times R =$	1.21	(72)
R is obtained from the 'responsiveness' column of Table 4a or Table 4d			
Adjusted living room temperature	$(70) + (71) + (72) =$	20.09	(73)
Temperature difference between zones (Table 9)		0.40	(74)
Living area fraction (0 to 1.0)	living room area $\div$ (5) =	0.50	(75)
Rest-of-house fraction	$1 - (75) =$	0.50	(76)
Mean internal temperature	$(73) - [(74) \times (76)] =$	19.89	(77)

8. Degree days

Temperature rise from gains	$(69) \div (37) =$	10.05	(78)
Base temperature	$(77) - (78) =$	9.84	(79)
Degree-days, *use box (79) and Table 10*		921.00	(80)

9. Space heating requirements

Space heating requirement (useful), kWh/year	$0.024 \times (80) \times (37) =$	951.84	(81)

For range cooker boilers where efficiency is obtained from the Boiler Efficiency Database or manufacturer's declared value, multiply the result in box (81) by (1 - Φ_{case}/Φ_{water}) where Φ_{case} is the heat emission from the case of the range cooker at fullload (in kW); and Φ_{water} is the heat transferred to water at full load (in kW). Φ_{case} and Φ_{water} are obtained from the database record for the range cooker boiler or manufacturer's declared value.

9a. Energy requirements - individual heating systems, including micro-CHP

Note: when space and water heating is provided by community heating use the alternative worksheet 9b

Space heating:

Fraction of heat from secondary/supplementary system (*use value from Table 11, Table 12a or Appendix F)*		0.00	(82)
Efficiency of main heating system, %		110.00	(83)
(SEDBUK or from Table 4a or 4b, adjusted where appropriate by the amount shown in the 'efficiency adjustment' column of Table 4c)			
Efficiency of secondary/supplementary heating system, % (use value from Table 4a or Appendix E)		0.00	(84)
Space heating fuel (main) requirement, kWh/year	$[1- (82)] \times (81) \times 100 \div (83) =$	865.31	(85)

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Space heating fuel (secondary), kWh/year $\qquad$ (82) × (81) ×100 ÷ (84) = $\boxed{\text{N/A}}$ (85a)

Water heating:

Efficiency of water heater, % $\boxed{104.76}$ (86)
  (SEDBUK or from Table 4a or 4b, adjusted where appropriate by the amount shown in the 'efficiency adjustment' column of Table 4c)

Energy required for water heating, kWh/year $\qquad$ (51) × 100 ÷ (86) = $\boxed{1752.11}$ (86a)

Electricity for pumps and fans: kWh/year

each central heating pump, (Table 4f) $\boxed{0.00}$ (87a)

each boiler with a fan-assisted flue (Table 4f) $\boxed{0.00}$ (87b)

warm air heating system fans (Table 4f) $\boxed{0.00}$ (87c)

mechanical ventilation -balanced, extract or positive input from outside (Table 4f) $\boxed{357.29}$ (87d)

maintaining keep-hot facility for gas combi boiler (Table 4f) $\boxed{0.00}$ (87e)

pump for solar water heating (Table 4f) $\boxed{75.00}$ (87f)

Total electricity for the above equipment, kWh/year $\qquad$ (87a)+(87b)+(87c)+(87d)+(87e)+(87f) = $\boxed{432.29}$ (87)

10a. Fuel costs - individual heating systems

	Fuel kWh/year		Fuel price (Table 12)		Fuel cost £/year	
Space heating - main system	(85)	×	$\boxed{1.63}$	×0.01 =	$\boxed{14.10}$	(88)
Space heating - secondary	(85a)	×	$\boxed{\text{N/A}}$	× 0.01 =	$\boxed{0.00}$	(89)

Water heating

Water heating cost (electric, off-peak tariff)

On-peak fraction (Table 13, or Appendix F for electric CPSUs) $\boxed{0.00}$ (90)

Off-peak fraction $\qquad$ 1.0 - (90) = $\boxed{1.00}$ (90a)

		Fuel price			
On-peak cost	(86a) × (90) ×	$\boxed{\text{N/A}}$	× 0.01 =	$\boxed{0.00}$	(91)
Off-peak cost	(86a) × (90a) ×	$\boxed{\text{N/A}}$	× 0.01 =	$\boxed{0.00}$	(91a)
Water heating cost (other fuel)	(86a) ×	$\boxed{1.63}$	× 0.01 =	$\boxed{28.56}$	(91b)
Pump and fan energy cost	(87) ×	$\boxed{7.12}$	× 0.01 =	$\boxed{30.78}$	(92)
Energy for lighting (calculated in Appendix L)	$\boxed{395.95}$ ×	$\boxed{7.12}$	× 0.01 =	$\boxed{28.19}$	(93)
Additional standing charges (Table 12)				$\boxed{34.00}$	(94)

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Renewable and energy-saving technologies (Appendices M and N)

Energy produced or saved, kWh/year	N/A	(95)					
Cost of energy produced or saved, £/year	(95)	×	N/A	× 0.01 =	N/A	(95a)
Energy consumed by the technology, kWh/year	N/A	(96)					
Cost of energy consumed, £/year	(96)	×	N/A	×0.01 =	N/A	(96a)

Special features (Appendix Q)

Energy produced or saved, kWh/year	311.00	(s1)					
Cost of energy produced or saved, £/year	(s1)	×	7.12	× 0.01 =	22.14	(s1a)
Energy consumed by the technology, kWh/year	0.00	(s2)					
Cost of energy consumed, £/year	(s2)	×	N/A	×0.01 =	N/A	(s2a)

Total energy cost	(88)+(89)+(91)+(91a)+(91b)+(92)+(93)+(94)-(95a)+(96a)-(s1a)+(s2a) =	113.49	(97)

11a. SAP rating - individual heating systems

Energy cost deflator (SAP 2005)	0.91	(98)
Energy cost factor (ECF)	$\{[(97) \times (98)] - 30.0\} \div \{(5) + 45.0\} =$ 0.72	(99)
SAP rating (Table 14)	89.90	(100)
SAP band	B	

12a. Carbon dioxide emissions rate for individual heating systems (including micro-CHP) and community heating without CHP

Individual heating system:	Energy kWh/year		Emission factor kg CO_2/kWh		Emissions kgCO_2/year	
Space heating main from box (85)	865.31	×	0.194	=	167.87	(101)
Space heating secondary from box (85a)	N/A	×	N/A	=	0.00	(102)
Energy for water heating from box (86a)	1752.11	×	0.194	=	339.91	(103)

Community scheme:

Efficiency of community boilers % *use actual efficiency if known, or value in Table 4a*					N/A	(104)
Energy for space heating (87*) × 100 ÷(104) =	N/A	×	N/A	=	N/A	(105)
Energy for water heating (87b*) × 100 ÷(104) =	N/A	×	N/A	=	N/A	(106)
Space and water heating	[(101) + (102) + (103)] or [(105) + (106)] =				507.78	(107)

Electricity for pumps and fans from box (87) or (88*)	432.29	×	0.422	=	182.43	(108)

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Energy for lighting from Appendix L	395.95	×	0.422	=	167.09	(109)
Energy produced or saved in dwelling (Appendices M and N)	(95) or (95*)	×	N/A	=	0.00	(110)
Energy consumed by the above technology (Appendices M and N)	(96) or (96*)	×	N/A	=	0.00	(111)
Energy produced or saved in dwelling (Appendix Q)	(s1) or (s1*)	×	0.422	=	131.24	(s1a)
Energy consumed by the above technology (Appendix Q)	(s2) or (s2*)	×	N/A	=	0.00	(s2a)
Total CO_2 kg/year	(107) + (108) + (109) - (110) + (111) - (s1a) + (s2a)			=	726.06	(112)
Carbon dioxide emissions rate		(112) ÷ (5)		=	12.89	(113)
EI rating					90.40	
EI band					B	

13a. Primary energy, for individual heating systems (including micro-CHP) and community heating without CHP

Individual heating system:	Energy kWh/year		Primary energy factor		Primary energy (kWh/year)
Space heating main from box (85)	865.31	×	1.150	=	995.11
Space heating secondary from box (85a)	N/A	×	N/A	=	0.00
Energy for water heating from box (86a)	1752.11	×	1.150	=	2014.93

Community scheme:

Efficiency of community boilers %   N/A   (104)
use actual efficiency if known, or value in Table 4a

Energy for space heating	(87*) × 100 ÷ (104) =	N/A	×	N/A	=	N/A
Energy for water heating	(87b*) × 100 ÷ (104) =	N/A	×	N/A	=	N/A
						3010.04

Space and water heating

Electricity for pumps and fans from box (87) or (88*)	432.29	×	2.800	=	1210.42
Energy for lighting from Appendix L	395.95	×	2.800	=	1108.66
Energy produced or saved in dwelling (Appendices M and N)	(95) or (95*)	×	N/A	=	0.00
Energy consumed by the above technology (Appendices M and N)	(96) or (96*)	×	N/A	=	0.00
Energy produced or saved in dwelling (Appendix Q)	(s1) or (s1*)	×	2.800	=	870.80
Energy consumed by the above technology (Appendix Q)	(s2) or (s2*)	×	N/A	=	0.00
Primary energy kWh/year					4458.32
Primary energy kWh/m²/year					79.16

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