

Full SAP Calculation Printout

Users Ref: 7869-0001-0001158

Issued on: 29.October.2008

Prop Type Ref:

Property: Standard, 01, Example, example, example

TER: 22.13

DER: 22.10

SAP Rating: 80 C

SAP Energy Cost: £306

CO2 Emissions: 2.70 t/year

EI Rating: 79 C

Energy used: 126 kWh/m2/year

Ene1: 0

ZC: 0.00

Surveyor: 7869-0001, Matthew Carter, Tel: PE25 3ER, Fax: .

Address: Burton Lodge, Marine Avenue, Skegness, Lincolnshire

Client: 00227, Sune Nightingale, Srovesonline Limited, Capton, Dartmouth, Devon, TQ6 0JE, Tel: 0117 3026754

Software Version: EES SAP 2005.015.build.0019, March 2008 (Design System), BRE SAP Worksheet 9.81

Regs Type: SAP 2005, Regs Region: England and Wales (Part L1A 2006), Construction Type: New Build

CALCULATION DETAILS for survey reference no '7869-0001-0001158'

Page: 1

SAP2005 input data (DesignData) -

Regs Region: England
Construction Type: NewBuild
Region: MI Midlands (15.5)
Orientation: N North
PropType: H House, D Detached
Storeys: 2
Property Age: 2008
Sheltered Sides: 2
Sunlight Shade: Average or unknown
Wall Perimeter: 35.00 m, 35.00 m
Floor Area: 65.00 m2, 65.00 m2
Living Floor Area: 20.00 m2
Storey Height: 2.50 m, 2.50 m
Doors
Front door: Solid Wood, uvalue: 3.00 (T), area: 1.89 m2
Windows
Front windows: Double, Low E, Soft Coat, PVC, 16 mm, North (0°), uvalue: 1.70 (T)
Side windows: Double, Low E, Soft Coat, PVC, 16 mm, East (270°), uvalue: 1.70 (T)
Rear windows: Double, Low E, Soft Coat, PVC, 16 mm, South (180°), uvalue: 1.70 (T)
Draught Lobby: No
Draught Proofing: 100%
Roof Lights
Pressure Test: Air permeability 8.00 m³/h.m² (assumed)
Mechanical Ventilation: None, Windows open during hot weather: Windows fully open
Cross ventilation possible: Yes
Fans, Chimneys, Flues: 3, 0, 1
Lighting: Low energy lighting in 50% of fixed outlets
Main Wall Type: U: 0.28 A: X(153.11 m2)
Extented Wall Types:
Timber Frame Wall Area: 0.00
Roof Main: U: 0.16 A: 65.00 m2
Main Floor Type: U: 0.20 A: 65.00 m2
Timber Floor: No Timber Floor
Thermal Mass: Simple Thermal Mass Parameter calculation:
Ground Floor Mass: Low - suspended timber floor
External Wall Mass: Low - timber/steel frame walls or masonry wall
Separating Wall Mass: Low - plasterboard on timber/steel stud
Internal Partition Mass: Low - plasterboard on timber/steel stud
Manufacturer's data: Clients choice, Pumped: pump in heated space
Main Heating: Manufacturer's data: Clients choice, to Clients Spec, 88.0%
Main Heating Manufacturer: CBD Programmer, room thermostat and TRVs
Heating Controls: Boiler interlock - Yes
Underfloor Heating: None
Combi Type: StandardCombi
Combi Keep Hot: WithoutKeepHot
Secondary Heating: None

Manufacturer:
Thermal Store: None
Hot Water Heating: HWP From the primary heating system
Hot Water Cylinder: None
Solar Water Heating: None
Electricity Tariff: 7 - Hour Off Peak
PV Cells: None
Thermal Bridges: DefaultRobustConstr, Thermal bridging factor $\gamma = 0.08$
Energy Saved:
Energy Used:
Terrain Type: Urban
Number of Wind Turbines: 0
Small-scale hydro generators: 0.00

SAP calculation (Existing Dwelling as Designed)

| | | | |
|--------------------------------------|-----------------------------|---------|-------|
| 1. Overall house dimensions | | | |
| Ground floor | 65.000 * 2.500 | 162.50 | |
| First floor | 65.000 * 2.500 | 162.50 | |
| Total floor area | 130.000 | | (5) |
| Total house volume | | 325.00 | (6) |
| 2. Ventilation rate | | | |
| Number of chimneys | 0 * 40 | 0 | |
| Number of flues | 1 * 20 | 20 | |
| Number of fans | 3 * 10 | 30 | |
| Flueless gas fire | 0 * 40 | 0 | |
| Infiltration | | 0.15 | (10) |
| Pressure test value | | 8.00 | (q50) |
| Infiltration rate | | 0.55 | (19) |
| Sides sheltered | | 2 | (20) |
| Shelter factor | | 0.85 | (21) |
| Adjusted infiltration rate | | 0.47 | (22) |
| Air change natural ventilation | | 0.61 | (24) |
| Effective air change rate | | 0.61 | (25) |
| 3. Heat losses | | | |
| Doors Front door | 1.890 * 3.000 | 5.67 | |
| Doors Heat Loss total | | 5.67 | (26) |
| Windows Front windows | 8.000 * 1/[(1/ 1.700)+0.04] | 12.73 | |
| Windows Side windows | 4.000 * 1/[(1/ 1.700)+0.04] | 6.37 | |
| Windows Rear windows | 8.000 * 1/[(1/ 1.700)+0.04] | 12.73 | |
| Windows Heat Loss total | | 31.84 | (27) |
| Roof Lights Heat Loss total | | 0.00 | (27) |
| Ground floor 1 | 65.000 * 0.200 | 13.00 | |
| Ground floor Heat Loss total | | 13.00 | (28) |
| Main External wall type | 153.110 * 0.280 | 42.87 | (29) |
| Secondary walls Loss total | | 0.00 | (29a) |
| Roof Main | 65.000 * 0.160 | 10.40 | (30) |
| Roof Loss total | | 10.40 | (30) |
| Total area of elements | | 305.00 | (32) |
| Fabric heat loss | | 103.78 | (33) |
| Appendix K: Thermal bridging | | 0.08 | (y) |
| Effect of thermal bridges | | 24.40 | (34) |
| Total fabric heat loss | | 128.18 | (35) |
| Ventilation heat loss | | 65.51 | (36) |
| Heat loss coefficient | | 193.69 | (37) |
| Heat loss parameter (HLP) | | 1.49 | (38) |
| 4. Water heating energy requirements | | | |
| Energy of heated water | | 2459.98 | (39) |
| Distribution loss | | 434.11 | (40) |
| Hot Water storage loss factor | | 0.0000 | (44) |
| Volume factor | | 0.000 | (44a) |
| Temperature factor T | | 1.00 | (44b) |
| Energy lost from tank | | 0.00 | (45) |
| Energy lost from tank | | 0.00 | (46) |
| If cyl contains solar storage | | 0.00 | (47) |
| Primary circuit loss | | 0.00 | (48) |

| | | | |
|--|--|---------|-----------|
| Combi loss from Table 3a | | 600.00 | (49) |
| Output from water heater | | 3494.09 | (51) |
| Gains from water heating | | 1112.29 | (52) |
| 5. Internal gains | | | |
| Lighting, appliances, cooking and metabolic (Table 5) | | 714.84 | (53) |
| Reduction of internal gains due to LE lighting (Appendix L) | | | |
| Correction factor for low-energy outlets | | 0.75 | (C1) |
| Window 1 | 0.9 * 8.000 * 0.80 * 0.7 * 0.83 / 130.000 | 0.03 | |
| Window 2 | 0.9 * 4.000 * 0.80 * 0.7 * 0.83 / 130.000 | 0.01 | |
| Window 3 | 0.9 * 8.000 * 0.80 * 0.7 * 0.83 / 130.000 | 0.03 | |
| Ratio of glass area to floor area | | 0.06 | (GL) |
| Correction factor for daylighting | | 1.01 | (C2) |
| Annual energy used for lighting in the house | | 915.36 | (EL) |
| Reduction in lighting use due to low energy lights | | 305.12 | (deltaEL) |
| Low energy lighting | | -45.77 | (53a) |
| Central heating pump | | 10.00 | (53b) |
| Water heating | | 126.97 | (54) |
| Total internal gains | | 806.04 | (55) |
| 6. Solar gains | | | |
| | Access Area Flux g FF Gains | | |
| | Factor (m2) | (W) | |
| Windows 'N ' | 0.770 * 8.000 * 29.000 * 0.9 * 0.630 * 0.7 | 70.90 | (56) |
| Windows1 'E ' | 0.770 * 4.000 * 48.000 * 0.9 * 0.630 * 0.7 | 58.68 | (58) |
| Windows2 'S ' | 0.770 * 8.000 * 72.000 * 0.9 * 0.630 * 0.7 | 176.03 | (60) |
| Total solar gains | | 305.61 | (65) |
| Total gains, W | | 1111.66 | (66) |
| Gains/loss ratio (GLR) | | 5.74 | (67) |
| Utilisation factor | | 0.957 | (68) |
| Useful gains, W | | 1063.36 | (69) |
| 7. Mean internal temperature | | | |
| Mean internal temperature of living zone (heating type = 1) | | 18.88 | (70) |
| Temperature adjustment | | 0.00 | (71) |
| Adjustment for gains | | 0.30 | (72) |
| Adjusted room temperature | | 19.18 | (73) |
| Temperature difference between zones | | 1.49 | (74) |
| Living area fraction | | 0.154 | (75) |
| Rest of house floor fraction | | 0.846 | (76) |
| Mean internal temperature | | 17.92 | (77) |
| 8. Degree days | | | |
| Temperature raise from gains | | 5.49 | (78) |
| Base temperature | | 12.43 | (79) |
| Degree days | | 1434.99 | (80) |
| 9a. Energy requirements - individual heating systems, including micro-CHP | | | |
| Space heating requirement (useful) | | 6670.47 | (81) |
| Model name : Clients choice | | | |
| Manufacturer: to Clients Spec | | | |
| MHS efficiency | | 88.0 | |
| Main system efficiency | | 88.0 | (83) |
| Secondary system efficiency | | 0.0 | (84) |
| Space heating fuel - main HS | | 7580.08 | (85) |
| Space heating fuel - secondary HS | | 0.00 | (85a) |
| Efficiency of water heater | | 88.00 | (86) |
| Energy required for water heating | | 3494.09 | |
| Energy used for water heating | | 3970.56 | (86a) |
| For each central heating pump | | 130.00 | (87a) |
| For each boiler with F.A.F | | 45.00 | (87b) |
| Electricity for pumps, fans, ... | | 175.00 | (87) |
| Electricity for lighting (50% fixed LEL) | | 915.36 | (87g) |
| 10a. Fuel costs - individual heating systems | | | |

| | | | |
|--|----------------------------|----------|--------|
| MHS heating cost | [7580.08 * 1.6300 * 0.01] | 123.56 | (88) |
| SHS heating cost | [0.00 * 0.0000 * 0.01] | 0.00 | (89) |
| Water heating cost | [3970.56 * 1.6300 * 0.01] | 64.72 | (91) |
| Pump/fan energy | [175.00 * 7.6500 * 0.01] | 13.39 | (92) |
| Lighting energy | [915.36 * 7.6500 * 0.01] | 70.02 | (93) |
| Additional standing charges | | 34.00 | (94) |
| Total energy cost | | 305.69 | (97) |
| Total energy cost using Sedbuk db prices | | 463.59 | |
| 11. SAP rating | | | |
| Energy cost deflator | | 0.91 | (98) |
| Energy cost factor | | 1.42 | (99) |
| ECF unrounded = 1.41814822533168 | | | |
| SAP value | | 80.20 | |
| SAP value unrounded = 80.2026507743697 | | | |
| SAP Energy rating | | 80 | (100) |
| SAP Energy rating band | | C | |
| 12a. Carbon dioxide emissions | | | |
| MHS heating CO2 | [7580.08 * 0.1940] | 1470.53 | (101) |
| WHS heating CO2 | [3970.56 * 0.1940] | 770.29 | (103) |
| Space and water heating CO2 | | 2240.82 | (107) |
| Pumps and fans CO2 | [175.00 * 0.4220] | 73.85 | (108) |
| Lighting CO2 | [915.36 * 0.4220] | 386.28 | (109) |
| Total CO2 emissions in kg/year | | 2700.95 | (112) |
| Dwelling's Carbon Factor | | 15.43 | (CF) |
| Environmental Impact Rating | | 79.32 | |
| Environmental Impact Rating rounded | | 79 | |
| Environmental Impact Rating band | | C | |
| 13a. Primary energy | | | |
| MHS heating P.E. | [7580.08 * 1.1500] | 8717.09 | |
| WHS heating P.E. | [3970.56 * 1.1500] | 4566.14 | |
| Space and water heating P.E. | | 13283.23 | |
| Pumps and fans P.E. | [175.00 * 2.8000] | 490.00 | (104) |
| Lighting P.E. | [915.36 * 2.8000] | 2563.01 | (104a) |
| Primary energy kWh/year | | 16336.24 | |
| Primary energy kWh/m2/year | | 125.66 | (105) |

DER calculation (Existing Dwelling as Designed)

| | | | |
|--------------------------------------|-----------------------------|---------|-------|
| 1. Overall house dimensions | | | |
| Ground floor | 65.000 * 2.500 | 162.50 | |
| First floor | 65.000 * 2.500 | 162.50 | |
| Total floor area | 130.000 | | (5) |
| Total house volume | | 325.00 | (6) |
| 2. Ventilation rate | | | |
| Number of chimneys | 0 * 40 | 0 | |
| Number of flues | 1 * 20 | 20 | |
| Number of fans | 3 * 10 | 30 | |
| Flueless gas fire | 0 * 40 | 0 | |
| Infiltration | | 0.15 | (10) |
| Pressure test value | | 8.00 | (q50) |
| Infiltration rate | | 0.55 | (19) |
| Sides sheltered | | 2 | (20) |
| Shelter factor | | 0.85 | (21) |
| Adjusted infiltration rate | | 0.47 | (22) |
| Air change natural ventilation | | 0.61 | (24) |
| Effective air change rate | | 0.61 | (25) |
| 3. Heat losses | | | |
| Doors Front door | 1.890 * 3.000 | 5.67 | |
| Doors Heat Loss total | | 5.67 | (26) |
| Windows Front windows | 8.000 * 1/[(1/ 1.700)+0.04] | 12.73 | |
| Windows Side windows | 4.000 * 1/[(1/ 1.700)+0.04] | 6.37 | |
| Windows Rear windows | 8.000 * 1/[(1/ 1.700)+0.04] | 12.73 | |
| Windows Heat Loss total | | 31.84 | (27) |
| Roof Lights Heat Loss total | | 0.00 | (27) |
| Ground floor 1 | 65.000 * 0.200 | 13.00 | |
| Ground floor Heat Loss total | | 13.00 | (28) |
| Main External wall type | 153.110 * 0.280 | 42.87 | (29) |
| Secondary walls Loss total | | 0.00 | (29a) |
| Roof Main | 65.000 * 0.160 | 10.40 | (30) |
| Roof Loss total | | 10.40 | (30) |
| Total area of elements | | 305.00 | (32) |
| Fabric heat loss | | 103.78 | (33) |
| Appendix K: Thermal bridging | | 0.08 | (y) |
| Effect of thermal bridges | | 24.40 | (34) |
| Total fabric heat loss | | 128.18 | (35) |
| Ventilation heat loss | | 65.51 | (36) |
| Heat loss coefficient | | 193.69 | (37) |
| Heat loss parameter (HLP) | | 1.49 | (38) |
| 4. Water heating energy requirements | | | |
| Energy of heated water | | 2459.98 | (39) |
| Distribution loss | | 434.11 | (40) |
| Hot Water storage loss factor | | 0.0000 | (44) |
| Volume factor | | 0.000 | (44a) |
| Temperature factor T | | 1.00 | (44b) |
| Energy lost from tank | | 0.00 | (45) |
| Energy lost from tank | | 0.00 | (46) |
| If cyl contains solar storage | | 0.00 | (47) |
| Primary circuit loss | | 0.00 | (48) |

| | | | |
|--|--|---------|-----------|
| Combi loss from Table 3a | | 600.00 | (49) |
| Output from water heater | | 3494.09 | (51) |
| Gains from water heating | | 1112.29 | (52) |
| 5. Internal gains | | | |
| Lighting, appliances, cooking and metabolic (Table 5) | | 714.84 | (53) |
| Reduction of internal gains due to LE lighting (Appendix L) | | | |
| Correction factor for low-energy outlets | | 0.85 | (C1) |
| Window 1 | 0.9 * 8.000 * 0.80 * 0.7 * 0.83 / 130.000 | 0.03 | |
| Window 2 | 0.9 * 4.000 * 0.80 * 0.7 * 0.83 / 130.000 | 0.01 | |
| Window 3 | 0.9 * 8.000 * 0.80 * 0.7 * 0.83 / 130.000 | 0.03 | |
| Ratio of glass area to floor area | | 0.06 | (GL) |
| Correction factor for daylighting | | 1.01 | (C2) |
| Annual energy used for lighting in the house | | 1037.41 | (EL) |
| Reduction in lighting use due to low energy lights | | 183.07 | (deltaEL) |
| Low energy lighting | | -27.46 | (53a) |
| Central heating pump | | 10.00 | (53b) |
| Water heating | | 126.97 | (54) |
| Total internal gains | | 824.35 | (55) |
| 6. Solar gains | | | |
| | Access Area Flux g FF Gains | | |
| | Factor (m2) | (W) | |
| Windows 'N ' | 0.770 * 8.000 * 29.000 * 0.9 * 0.630 * 0.7 | 70.90 | (56) |
| Windows1 'E ' | 0.770 * 4.000 * 48.000 * 0.9 * 0.630 * 0.7 | 58.68 | (58) |
| Windows2 'S ' | 0.770 * 8.000 * 72.000 * 0.9 * 0.630 * 0.7 | 176.03 | (60) |
| Total solar gains | | 305.61 | (65) |
| Total gains, W | | 1129.96 | (66) |
| Gains/loss ratio (GLR) | | 5.83 | (67) |
| Utilisation factor | | 0.954 | (68) |
| Useful gains, W | | 1078.31 | (69) |
| 7. Mean internal temperature | | | |
| Mean internal temperature of living zone (heating type = 1) | | 18.88 | (70) |
| Temperature adjustment | | 0.00 | (71) |
| Adjustment for gains | | 0.31 | (72) |
| Adjusted room temperature | | 19.19 | (73) |
| Temperature difference between zones | | 1.49 | (74) |
| Living area fraction | | 0.154 | (75) |
| Rest of house floor fraction | | 0.846 | (76) |
| Mean internal temperature | | 17.93 | (77) |
| 8. Degree days | | | |
| Temperature raise from gains | | 5.57 | (78) |
| Base temperature | | 12.37 | (79) |
| Degree days | | 1422.02 | (80) |
| 9a. Energy requirements - individual heating systems, including micro-CHP | | | |
| Space heating requirement (useful) | | 6610.18 | (81) |
| Fraction of heat from secondary system | | 0.10 | (82) |
| Model name : Clients choice | | | |
| Manufacturer: to Clients Spec | | | |
| MHS efficiency | | 88.0 | |
| Main system efficiency | | 88.0 | (83) |
| Secondary system efficiency | | 100.0 | (84) |
| Space heating fuel - main HS | | 6760.41 | (85) |
| Space heating fuel - secondary HS | | 661.02 | (85a) |
| Efficiency of water heater | | 88.00 | (86) |
| Energy required for water heating | | 3494.09 | |
| Energy used for water heating | | 3970.56 | (86a) |
| For each central heating pump | | 130.00 | (87a) |
| For each boiler with F.A.F | | 45.00 | (87b) |
| Electricity for pumps, fans, ... | | 175.00 | (87) |
| Electricity for lighting (30% fixed LEL) | | 1037.41 | (87g) |

| | | | |
|--|----------------------------|---------|-------|
| 10a. Fuel costs - individual heating systems | | | |
| MHS heating cost | [6760.41 * 1.6300 * 0.01] | 110.19 | (88) |
| SHS heating cost | [661.02 * 7.6500 * 0.01] | 50.57 | (89) |
| Water heating cost | [3970.56 * 1.6300 * 0.01] | 64.72 | (91) |
| Pump/fan energy | [175.00 * 7.6500 * 0.01] | 13.39 | (92) |
| Lighting energy | [1037.41 * 7.6500 * 0.01] | 79.36 | (93) |
| Additional standing charges | | 34.00 | (94) |
| Total energy cost | | 352.23 | (97) |
| Total energy cost using Sedbuk db prices | | 526.07 | |
| | | | |
| 12a. Carbon dioxide emissions | | | |
| MHS heating CO2 | [6760.41 * 0.1940] | 1311.52 | (101) |
| SHS heating CO2 | [661.02 * 0.4220] | 278.95 | (102) |
| WHS heating CO2 | [3970.56 * 0.1940] | 770.29 | (103) |
| Space and water heating CO2 | | 2360.76 | (107) |
| Pumps and fans CO2 | [175.00 * 0.4220] | 73.85 | (108) |
| Lighting CO2 | [1037.41 * 0.4220] | 437.79 | (109) |
| Total CO2 emissions in kg/year | | 2872.39 | (112) |
| | | | |
| Dwelling's Carbon Emission Rate (DER) - orientation: N | | 22.10 | (113) |
| Dwelling's Carbon Factor | | 16.41 | (CF) |
| Environmental Impact Rating | | 78.01 | |
| Environmental Impact Rating rounded | | 78 | |
| Environmental Impact Rating band | | C | |

TER calculation (Existing Dwelling as Designed)

| | | | |
|--------------------------------------|------------------------------|---------|-------|
| 1. Overall house dimensions | | | |
| Ground floor | 65.000 * 2.500 | 162.50 | |
| First floor | 65.000 * 2.500 | 162.50 | |
| Total floor area | 130.000 | | (5) |
| Total house volume | | 325.00 | (6) |
| 2. Ventilation rate | | | |
| Number of chimneys | 0 * 40 | 0 | |
| Number of flues | 0 * 20 | 0 | |
| Number of fans | 3 * 10 | 30 | |
| Flueless gas fire | 0 * 40 | 0 | |
| Infiltration | | 0.09 | (10) |
| Pressure test value | | 10.00 | (q50) |
| Infiltration rate | | 0.59 | (19) |
| Sides sheltered | | 2 | (20) |
| Shelter factor | | 0.85 | (21) |
| Adjusted infiltration rate | | 0.50 | (22) |
| Air change natural ventilation | | 0.63 | (24) |
| Effective air change rate | | 0.63 | (25) |
| 3. Heat losses | | | |
| Doors One opaque door | 1.850 * 2.000 | 3.70 | |
| Doors Heat Loss total | | 3.70 | (26) |
| Windows Double glazed, low-E | 30.650 * 1/[(1/ 2.000)+0.04] | 56.76 | |
| Windows Heat Loss total | | 56.76 | (27) |
| Roof Lights Heat Loss total | | 0.00 | (27) |
| Ground floor 1 | 65.000 * 0.250 | 16.25 | |
| Ground floor Heat Loss total | | 16.25 | (28) |
| Main External wall type | 142.500 * 0.350 | 49.88 | (29) |
| Secondary walls Loss total | | 0.00 | (29a) |
| Roof Main | 65.000 * 0.160 | 10.40 | (30) |
| Roof Loss total | | 10.40 | (30) |
| Total area of elements | | 305.00 | (32) |
| Fabric heat loss | | 136.98 | (33) |
| Appendix K: Thermal bridging | | 0.11 | (y) |
| Effect of thermal bridges | | 33.55 | (34) |
| Total fabric heat loss | | 170.53 | (35) |
| Ventilation heat loss | | 67.22 | (36) |
| Heat loss coefficient | | 237.75 | (37) |
| Heat loss parameter (HLP) | | 1.83 | (38) |
| 4. Water heating energy requirements | | | |
| Energy of heated water | | 2459.98 | (39) |
| Distribution loss | | 434.11 | (40) |
| Tank volume | | 150.00 | (43) |
| Hot Water storage loss factor | | 0.0191 | (44) |
| Volume factor | | 0.928 | (44a) |
| Temperature factor T | | 0.54 | (44b) |
| Energy lost from tank | | 524.28 | (45) |
| Energy lost from tank | | 524.28 | (46) |
| If cyl contains solar storage | | 524.28 | (47) |
| Primary circuit loss | | 610.00 | (48) |
| Output from water heater | | 4028.38 | (51) |

| | | | |
|---|--|-----------|-----------|
| Gains from water heating | | 1869.71 | (52) |
| 5. Internal gains | | | |
| Lighting, appliances, cooking and metabolic (Table 5) | | 714.84 | (53) |
| Reduction of internal gains due to LE lighting (Appendix L) | | | |
| Correction factor for low-energy outlets | | 0.85 | (C1) |
| Window 1 | $0.9 * 30.650 * 0.80 * 0.7 * 0.83 / 130.000$ | 0.10 | |
| Ratio of glass area to floor area | | 0.10 | (GL) |
| Correction factor for daylighting | | 0.96 | (C2) |
| Annual energy used for lighting in the house | | 986.54 | (EL) |
| Reduction in lighting use due to low energy lights | | 174.10 | (deltaEL) |
| Low energy lighting | | -26.11 | (53a) |
| Central heating pump | | 10.00 | (53b) |
| Water heating | | 213.44 | (54) |
| Total internal gains | | 912.16 | (55) |
| 6. Solar gains | | | |
| | Access Factor | Area (m2) | Flux g |
| | | | FF |
| Windows 'E ' | 0.770 | 30.650 | 48.000 |
| | | | 0.9 |
| | | | 0.720 |
| | | | 0.7 |
| | | | |
| Gains (W) | | | |
| Windows 'E ' | | | 513.85 |
| Total solar gains | | | 513.85 |
| Total gains, W | | | 1426.01 |
| Gains/loss ratio (GLR) | | | 6.00 |
| Utilisation factor | | | 0.950 |
| Useful gains, W | | | 1355.09 |
| 7. Mean internal temperature | | | |
| Mean internal temperature of living zone (heating type = 1) | | 18.86 | (70) |
| Temperature adjustment | | 0.00 | (71) |
| Adjustment for gains | | 0.34 | (72) |
| Adjusted room temperature | | 19.20 | (73) |
| Temperature difference between zones | | 1.54 | (74) |
| Living area fraction | | 0.154 | (75) |
| Rest of house floor fraction | | 0.846 | (76) |
| Mean internal temperature | | 17.89 | (77) |
| 8. Degree days | | | |
| Temperature raise from gains | | 5.70 | (78) |
| Base temperature | | 12.20 | (79) |
| Degree days | | 1386.01 | (80) |
| 9a. Energy requirements - individual heating systems, including micro-CHP | | | |
| Space heating requirement (useful) | | 7908.65 | (81) |
| Fraction of heat from secondary system | | 0.10 | (82) |
| Model name : Clients choice | | | |
| Manufacturer: to Clients Spec | | | |
| MHS efficiency | | 78.0 | |
| Main system efficiency | | 78.0 | (83) |
| Secondary system efficiency | | 100.0 | (84) |
| Space heating fuel - main HS | | 9125.37 | (85) |
| Space heating fuel - secondary HS | | 790.87 | (85a) |
| Efficiency of water heater | | 78.00 | (86) |
| Energy required for water heating | | 4028.38 | |
| Energy used for water heating | | 5164.58 | (86a) |
| For each central heating pump | | 130.00 | (87a) |
| For each boiler with F.A.F | | 45.00 | (87b) |
| Electricity for pumps, fans, ... | | 175.00 | (87) |
| Electricity for lighting (30% fixed LEL) | | 986.54 | (87g) |
| 12a. Carbon dioxide emissions | | | |
| MHS heating CO2 | [9125.37 * 0.1940] | 1770.32 | (101) |
| SHS heating CO2 | [790.87 * 0.4220] | 333.75 | (102) |
| WHS heating CO2 | [5164.58 * 0.1940] | 1001.93 | (103) |
| Space and water heating CO2 | | 3106.00 | (107) |

| | | | |
|--|--------------------|---------|--------------|
| Pumps and fans CO2 | [175.00 * 0.4220] | 73.85 | (108) |
| Lighting CO2 | [986.54 * 0.4220] | 416.32 | (109) |
| Total CO2 emissions in kg/year | | 3596.17 | (112) |
| Dwelling's Carbon Factor | | 20.55 | (CF) |
| Environmental Impact Rating | | 72.46 | |
| Environmental Impact Rating rounded | | 72 | |
| Environmental Impact Rating band | | C | |
| | | | |
| CO2 for heating and hot water | | 3179.85 | (CH) |
| CO2 emissions from internal lighting | | 416.32 | (CL) |
| ADL1A - Table 1 Fuel factor | | 1.00 | (FuelFactor) |
| Level of reduction in CO2 - Improvement factor | | 20 | (%) |
| Total floor area | | 130.00 | (TFA) |
| Target Carbon Dioxide Emission Rate | | 22.13 | (TER) |

Regulation compliance checklist

| | |
|--|----|
| 1 TER and DER | OK |
| 1.1 Target Carbon Dioxide Emission Rate | |
| Main fuel - Gas, Fuel factor = 1.00, TER = 22.13 | |
| 1.2 Dwelling Carbon Dioxide Emission Rate - DER = 22.10 | |
| 1.3 DER 22.10 < TER 22.13 | |
| | |
| 2.1 Fabric U-values | OK |
| Wall 0.28 (0.35) 0.28 (0.70) OK | |
| Roof 0.16 (0.25) 0.16 (0.35) OK | |
| Floor 0.20 (0.25) 0.20 (0.70) OK | |
| Openings 1.81 (2.20) 3.00 (3.30) OK | |
| | |
| 2.3 Heating efficiency | OK |
| Manufacturer's data: Clients choice, Pumped: pump in heated space | |
| Efficiency - Manufacturer data: 88.0% | |
| Minimum permitted: 86.0% - OK | |
| Secondary heating: None | |
| | |
| 2.4 Cylinder insulation | OK |
| No cylinder | |
| | |
| 2.5 Controls | OK |
| Programmer, room thermostat and TRVs - OK | |
| | |
| 2.7 Low energy lighting | OK |
| Light fittings: 20, L.E.L. fittings: 10 = 50.00% > 25% - OK | |
| L.E.L. fittings required per 25m2 or part of TFA: 6 < 10 - OK | |
| | |
| 2.8 External lighting | OK |
| External lights: None | |
| | |
| 3.1 Summertime temperature | OK |
| Region: Midlands (15.5) | |
| Thermal mass parameter = 5.0 | |
| Ventilation rate in hot weather = 8.0 | |
| Overheating risk (Orientation 'N') = Not significant - OK | |
| | |
| 4.1 Key features | |
| Openings U-value 1.70 < 1.80 | |
| | |
| 4.5 Design air permeability | OK |
| Design air permeability = 8.0 | |
| | |
| Overall result: | OK |

Recommendation Level E

E Low energy lighting : 100%
Recommendation result : Recommended
E Recommendation no : 101
E Recommendation text : Low energy lighting for all fixed outlets
CO2 emissions : 2606.796
Total energy cost (_97) : 285.253
SAP rating : 82 (81.686)
E Recommendation : SAP change (81.686 - 80.203), increase = 1.483

Recommendation Level N

N Solar Panel : installed
Recommendation result : Recommended
N Recommendation no : 102
N Recommendation text : Solar water heating
CO2 emissions : 2422.116
Total energy cost (_97) : 272.815
SAP rating : 83 (82.589)
N Recommendation : SAP change (82.589 - 81.686), increase = 0.903
EffectTooSmall

Recommendation Level U

U Photovoltaics : 2.5 kWp
Recommendation result : Recommended
U Recommendation no : 103
U Recommendation text : Solar photovoltaic panels, 2.5 kWp
CO2 emissions : 1475.147
Total energy cost (_97) : 161.529
SAP rating : 91 (90.667)
U Recommendation : SAP change (90.667 - 81.686), increase = 8.981

Recommendation Level

V Wind turbine : blade diameter 1.75 m
Recommendation result : Recommended
V Recommendation no : 104
V Recommendation text : Wind turbine
CO2 emissions : 1448.387
Total energy cost (_97) : 158.201
SAP rating : 91 (90.909)
V Recommendation : SAP change (90.909 - 90.667), increase = 0.242
EffectTooSmall

Recommendation Total

| | |
|-------------------------|--------------------------------------|
| E Low energy lighting | : 100% |
| U Photovoltaics | : 2.5 kWp |
| Recommendation result | : Recommended |
| U Recommendation no | : 103 |
| U Recommendation text | : Solar photovoltaic panels, 2.5 kWp |
| CO2 emissions | : 1659.826 |
| Total energy cost (_97) | : 173.968 |
| SAP rating | : 90 (89.764) |