





ENERGY STATEMENT

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SAP06694 Energy Statement Proposed Development at 73-77 Clarence Road,
Wood Green,
London,
N22 8PG

Document Version

REV	DATE	DESCRIPTION	PREPARED	CHECKED
1	07/06/2026	First Draft V1	B.Whittingham	D.Barsted

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1. Executive Summary

1.1 Introduction

- 1.1.1 This energy strategy has been prepared on behalf of Graham Eades, hereafter referred to as the Applicant, in support of a full planning application for the development known as 73-77 Clarence Road, Wood Green, London N22 8PG hereafter referred to as the Development.

1.2 Policies and Requirements

1.2.1 National Policies

- 1.2.1.1 Below outlines the national policies this energy statement has been developed in accordance with,

1.2.2 National Planning Policy Framework

- 1.2.2.1 The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied.

- 1.2.2.2 It provides a framework within which locally-prepared plans for housing and other development can be produced.

1.2.3 Building Regulations Approved Document Part L

- 1.2.3.1 Part L of Building Regulations covers the conservation of fuel and power, Notional specifications have been designed as a benchmarking tool to assess against.

- 1.2.3.2 The DER (Dwelling Emission Rate) can therefore be assessed against the notional specification TER (Target Emission Rate).

- 1.2.3.3 As the proposed development contains existing structures, a notional baseline calculation has been calculated in the place of the TER (Target Emission Rate) targets.

1.2.3.4 The London Plan 2021

1.2.3.5 Policy SI 2 Minimising greenhouse gas emissions

1.2.3.6 Major development should be net zero-carbon.¹⁵¹ This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

1.2.3.7 be lean: use less energy and manage demand during operation

1.2.3.8 be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly

1.2.3.9 be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site

1.2.3.10 be seen: monitor, verify and report on energy performance.

1.2.3.11 Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

1.2.3.12 A minimum on-site reduction of at least 35 per cent beyond Building Regulations¹⁵² is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:

1.2.3.13 through a cash in lieu contribution to the borough's carbon offset fund, or

1.2.3.14 off-site provided that an alternative proposal is identified and delivery is certain.

1.2.3.15 Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.

1.2.3.16 For more information, please visit: [the london plan 2021.pdf](#)

1.2.4 Local Policies

1.2.4.1 Below outlines the local policies this energy statement has been developed in accordance with,

1.2.5 Haringey's Local Plan Strategic Policies 2013-2026

1.2.5.1 SP4: Working Towards A Low Carbon Haringey

- 1.2.5.1.1 Over the life time of the Local Plan, reducing energy use in buildings and working towards a low carbon borough will be one of the key challenges facing Haringey. The Council will promote the measures outlined below to reduce carbon emissions from new and existing buildings.
- 1.2.5.1.2 In line with London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction and occupation, by incorporating the following measures:
- 1.2.5.1.3 From 2011 onwards, all new residential development will achieve a minimum 25% reduction in total (regulated) CO2 emissions in line with Code for Sustainable Homes Level 4 energy standards, and should aim to achieve Level 6. All new residential development shall be zero carbon from 2016 onwards; and
- 1.2.5.1.4 From 2011 onwards all new non-residential development shall be built to at least BREEAM "very good" standard and should aim to achieve BREEAM "excellent" or the current nationally agreed standard. All new non-residential development shall be zero carbon from 2019.
- 1.2.5.1.5 The Council will promote low- and zero-carbon energy generation through the following measures:
- 1.2.5.1.6 Requiring all developments to assess, identify and implement, where viable, site-wide and area-wide decentralised energy facilities including the potential to link into a wider network;
- 1.2.5.1.7 Establishing local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible;
- 1.2.5.1.8 Working with neighbouring boroughs and other partners to explore ways of implementing sub-regional decentralised energy networks including the potential in the Upper Lee Valley Opportunity Area; and
- 1.2.5.1.9 All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from on site renewable energy regeneration, which can include connections to local sources of decentralised renewable energy.

1.2.5.1.10 Haringey Development Management DPD 2017

1.2.5.1.11 Policy DM21: Sustainable design, Layout and Construction

- 1.2.5.1.12 All new development, including building and landscape works, will be expected to consider and implement sustainable design, layout and construction techniques. Proposals should:
- 1.2.5.1.13 Apply the energy hierarchy to minimise energy use in order to meet, and if possible exceed, minimum carbon dioxide reduction requirements;
- 1.2.5.1.14 Apply the cooling hierarchy to reduce the potential for overheating and limit reliance on mechanical air conditioning systems;
- 1.2.5.1.15 Maximise opportunities to enhance biodiversity on-site, including through appropriate landscaping, Sustainable Drainage Systems, living roofs and green walls
- 1.2.5.1.16 Wherever possible, use building materials with high environmental performance ratings; and
- 1.2.5.1.17 Seek opportunities for locally sourced labour.
- 1.2.5.1.18 The Council will support appropriate measures to sustainably retrofit existing homes and non residential buildings.
- 1.2.5.1.19 Proposals that fail to demonstrate adequate consideration for sustainable design, layout and construction techniques will be resisted.
- 1.2.5.1.20 Consideration will be given to the use of carbon offset payments, to be secured by planning obligations, where it can be demonstrated that proposals are unable to meet carbon dioxide emission reduction targets on-site.

1.3 Assessment Methodology

1.3.1 As per the above national and local criteria, the below strategy has been adopted for the site,

1.3.1.1 To better reflect the emissions associated with the production of electricity, update fuel factors will be used as part of the assessment.

1.3.1.2 The energy hierarchy and a fabric first approach will be utilised.

1.4 Energy Efficiency Measures

1.4.1 The proposed development incorporates several energy efficiency measure and designs to ensure compliance & CO₂ reduction including:

1.4.2 Fabric Insulation improvements on Building Regulations Part L minimum standards,

1.4.3 Improved glazing U & G Values for the development,

1.4.4 Low Energy lighting scheme adopted on site,

1.4.5 Improvement upon air tightness of construction.

1.5 Low Carbon Energy Supply

1.5.1 The proposed development is not within an area of which allows for a decentralised energy network to be utilised,

1.5.2 Therefore, this option will not be explored further within this energy statement.

1.5.3 The proposed site sits within a Heat Network Priority Area; therefore, it is recommended that the site is development in a manner that will allow to connection to a district heating system in the future is one is to become feasible.

1.6 On-site renewable technologies

1.6.1 The proposed design of the development incorporates the use of **Air Source Heat pump** to meet the requirements of the local authority.

1.6.2 Further options have been reviewed to provide further carbon reductions; the use of on-site renewable technologies has been reviewed in further details within this statement.

1.7 Site Description

- 1.7.1 The proposed development is set as 73-77 Clarence Road, Wood Green, London N22 8PG
- 1.7.2 The proposed works to the site is the erection of no. 7 Converted flats.
- 1.7.3 The proposed development is to incorporate a high level of thermal performance and incorporate Renewable technology to ensure the new development achieve the local policy requirements.



Fig.1 Proposed Site Plans



Fig.2 Proposed Floor Plans



Fig.3 Proposed Elevations

1.8 Renewable and Low Carbon Energy

	Regulated domestic carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: Savings from energy demand reduction	3.5	26%
Be clean: Savings from heat network	0.0	0%
Be green: Savings from renewable energy	1.2	9%
Cumulative on site savings	4.7	35%

	Regulated domestic carbon dioxide	
	(Tonnes CO ₂ per annum)	
Baseline Carbon Emissions (Part L2021 standards)	13.2	
After Be Lean Measures	9.7	
After Be Green Measures	8.5	

2. Methodology

2.1 Limitations

- 2.1.1 The calculations and figures utilised within this energy statement are based on Building regulations Part L methodology and should not be understood as a predictive assessment of likely future energy requirements.
- 2.1.2 Other external factors will be present such as occupant system operation patterns and weather patterns.

2.2 Energy Hierarchy

- 2.2.1 The assessment has been carried out in accordance to the energy hierarchy method in line with GLA policy/s.
- 2.2.2 The energy hierarchy method has been utilised to ensure the design of the development has reduced the demand for energy as far as reasonably practicable prior to the consideration of integrating Low or Zero Carbon technologies.



2.3 Carbon Factors

- 2.3.1 The below emissions factors have been used within the calculations based on SAP10 emission factors.

Fuel	Emission Factor (kgCO ₂ /KWh)
Gas	0.210
Electricity	0.213

3. Be Lean Measures

3.0.1 The following sections details the design measures that have been considered/to be implemented at the development.

3.1 Thermal insulation

- 3.1.1 In order to reduce the overall heating and cooling requirements for the development it is imperative that the development incorporates an efficient thermal envelope.
- 3.1.2 The below elements have been considered for the development.
- 3.1.3 Fabric Insulation improvements on Building Regulations Part L minimum standards,
- 3.1.4 Air permeability targets implemented as part of the project to minimise heat loss,
- 3.1.5 Improved glazing U & G Values for the development,
- 3.1.6 Low Energy lighting scheme adopted on site.
- 3.1.7 The table below outlines the u-value targets for the development in comparison to the limiting factor set out in Building regulations Part L.

Element	U-Value (W/m ² K)
	Development
Existing upgraded wall (Upgraded Element Table 4.3)	0.25
New wall (New Element Table 4.2)	0.18
Flat roof (New Element Table 4.2)	0.14
Bay roof (Upgraded Element Table 4.3)	0.15
Plane roof (Upgraded Element 4.3)	0.11
Existing upgraded floor (Upgraded Element Table 4.3)	0.18
New ground floor (New Element Table 4.2)	0.12
Glazing	1.4
Doors	1.4
Air Permeability	8.00
Low Energy Lighting	75 lm/W
Thermal Bridging (Y-Value)	Default
MVHR	N/A
Waste Water Heat Recovery System	N/A

4. Be Clean Measures

4.1 Low Carbon Energy Supply

- 4.1.1 The proposed development does not have a significant thermal demand and is not within an area of which allows for a decentralised energy network to be utilised.
- 4.1.2 Therefore, this option will not be explored further within this energy statement.
- 4.1.3 The development (orange circle with black outline) does however fall within a potential project area (orange section with dashed outline) and considered to have relatively high savings from an ASHP heat network scenario and therefore the proposed development should be developed in preparation for connection and must consider the dwellings heating system capacity for flow temperatures of approximately 45 degrees and to allow consideration for hot water storage where possible.



5. Be Green Measures

5.0.1 The following sections discuss the renewable energy generation measures that have been considered, and those which will be implemented at the Development.

5.0.2 Renewable technologies harness energy from the environment and convert this to a useful form. Many renewable technologies are available. However, not all these are commercially viable, suitable for city-centre locations or appropriate for the Development.

5.0.3 Technologies considered for the Development include:

- Solar Hot Water Panels (Solar Thermal)
- Photovoltaic (PV) Cells
- Combined Heat and Power (CHP) and Micro-CHP (mCHP)
- Ground Source Heat Pumps (GSHP)
- Air Source Heat Pumps (ASHP)
- Wind Turbines
- Biomass

5.1 Solar Hot Water Panels

- 5.1.1 Solar Hot Water Panels or, Solar Panels as they are commonly known, are used to supplement the energy required for the domestic hot water requirement. The system will collect and absorb solar radiation and transfer the heat directly to the storage tank.
- 5.1.2 The circulation may then be either 'passive' thus relying on the natural convection or 'active' using a pump which increases a system's efficiency but has additional costs for the controls and energy requirement.
- 5.1.3 There are two main types of solar panel collector available to the UK market. The first is Flat Plate Collectors which consist of a dark absorber sheet with pipes built into the sheet encased in a weatherproof box.
- 5.1.4 This will pump the collected solar radiation to the storage device to heat the water for use. The second main system is Evacuated Tube Collectors.
- 5.1.5 These devices are more efficient and are effective under a "...wider range of conditions..." (TM38:2006) due to the energy being drawn from "...light rather than outside temperature..." This therefore allows this type of system to adapt to cooler climates.
- 5.1.6 **Solar Hot Water Panels have been deemed possible for this development due to the available roof space and DHW demand, the available roof space would allow the design to fully support the DHW. However, an alternative technology has been selected to further reduce the carbon emissions on site and to meet the financial and on-site feasibility.**

5.2 Photovoltaic (PV) Cells

- 5.2.1 Solar panel electricity systems, also known as solar Photovoltaics' (PV), capture the sun's energy using photovoltaic cells. These cells do not need direct sunlight to work - they can still generate some electricity on a cloudy day. The cells convert the sunlight into electricity, which can be used to run household appliances and lighting.
- 5.2.2 PV cells are made from layers of semi-conducting material, usually silicon. When light shines on the cell it creates an electric field across the layers. The stronger the sunshine, the more electricity is produced. Groups of cells are mounted together in panels or modules that can be mounted on your roof.
- 5.2.3 The power of a PV cell is measured in kilowatts peak (kWp). That is the rate at which it generates energy at peak performance in full direct sunlight during the summer. PV cells come in a variety of shapes and sizes. Most PV systems are made up of panels that fit on top of an existing roof, but you can also fit solar tiles.
- 5.2.4 **Photovoltaic (PV) Cells have been considered and have been deemed viable for this site, the available roof space available would allow for a solar PV array, the carbon emission reduction target has been met via other technology however so no further consideration has been taken, as well as the development being located in a sensitive conservation area limiting the capability for renewable technology.**

5.3 Combined Heat and Power (CHP) and Micro-CHP (mCHP)

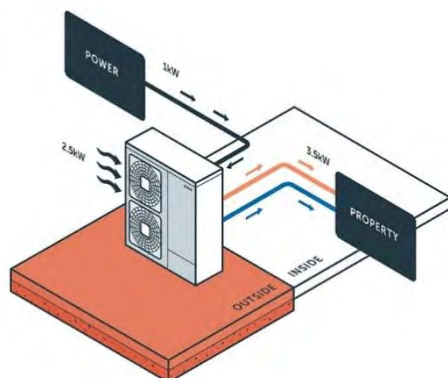
- 5.3.1 Micro-CHP' stands for micro combined heat and power. This technology generates heat and electricity simultaneously, from the same energy source, in individual homes or buildings. The main output of a micro-CHP system is heat, with some electricity generation, at a typical ratio of about 6:1 for domestic appliances.
- 5.3.2 A typical domestic system will generate up to 1kW of electricity once warmed up: the amount of electricity generated over a year depends on how long the system is able to run. Any electricity you generate and don't use can be sold back to the grid.
- 5.3.3 Domestic micro-CHP systems are currently powered by mains gas or LPG; in the future there may be models powered by oil or bio-liquids. Although gas and LPG are fossil fuels rather than renewable energy sources, the technology is still considered to be a 'low carbon technology' because it can be more efficient than just burning a fossil fuel for heat and getting electricity from the national grid. Micro-CHP systems are similar in size and shape to ordinary, domestic boilers and like them can be wall hung or floor standing. The only difference to a standard boiler is that they are able to generate electricity while they are heating water.
- 5.3.4 For the householder, there is little difference between a micro-CHP installation and a standard boiler. If the dwelling already has a conventional boiler then a micro-CHP unit should be able to replace it as it's roughly the same size. However, the installer must be approved under the Micro generation Certification Scheme. Servicing costs and maintenance are estimated to be similar to a standard boiler – although a specialist will be required.
- 5.3.5 **CHP and mCHP have been considered for the project, in order to house the system, an external additional plant area would be required and therefore the feasibility of the CHP has not been deemed acceptable or viable due to planning restrictions.**

5.4 Ground Source Heat Pumps (GSHP)

- 5.4.1 Ground source heat pumps use pipes which are buried in the garden to extract heat from the ground. This heat can then be used to heat radiators, underfloor or warm air heating systems and hot water in the home.
- 5.4.2 A ground source heat pump circulates a mixture of water and antifreeze around a loop of pipe - called a ground loop - which is buried in the garden. Heat from the ground is absorbed into the fluid and then passes through a heat exchanger into the heat pump. The ground stays at a constant temperature under the surface, so the heat pump can be used throughout the year - even in the middle of winter.
- 5.4.3 The length of the ground loop depends on the size of the home and the amount of heat needed. Longer loops can draw more heat from the ground, but need more space to be buried in. If space is limited, a vertical borehole can be drilled instead. Running costs will depend on several factors - including the size of the dwelling and how well insulated it is.
- 5.4.4 **Ground Source Heat Pump has been considered for this project and has not been deemed viable due to the available external space. A more suitable technology has been selected to reduce the carbon emissions as well as financial and on-site feasibility.**

5.5 Air Source Heat Pumps (ASHP)

- 5.5.1 Air source heat pumps absorb heat from the outside air. This heat can then be used to heat radiators, underfloor heating systems, or warm air convectors and hot water in dwellings.
- 5.5.2 An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can get heat from the air even when the temperature is as low as -15°C . Heat pumps have some impact on the environment as they need electricity to run, but the heat they extract from the ground, air, or water is constantly being renewed naturally.
- 5.5.3 Running costs will vary depending on several factors - including the size of the home, and how well insulated it is, and what room temperatures are achieved.
- 5.5.4 **Air Source Heat Pump has been considered for the project and has been deemed a viable option for the project, the carbon reductions of the installation of a ASHP ensure compliance the council requirements when compared to other non-zero carbon heat sources. Therefore, this technology has been adopted for the main heating and DHW.**
- 5.5.5 **ASHP will be adopted for ground floor flats 1 (green) and 2 (red).**



Location	Ground/External Façade/internally Mounted
Acoustic considerations	Noise impacts of Air source heat pumps should be considered due to pumps and plant located Externally.
Groundworks	No groundwork requirements
Export possible	Export of electricity to the grid is not possible for this technology
Maintenance	heat pumps are a low-maintenance heating option, it is still important to have them serviced regularly to make sure they are performing safely and efficiently
Service Life	20-25 years

5.6 Wind Turbines

- 5.6.1 Wind turbines harness the power of the wind and use it to generate electricity. Forty percent of all the wind energy in Europe blows over the UK, making it an ideal country for domestic turbines (known as 'microwind' or 'small-wind' turbines). A typical system in an exposed site could easily generate more power than a dwelling's lights and electrical appliances use.
- 5.6.2 Wind turbines use large blades to catch the wind. When the wind blows, the blades are forced round, driving a turbine which generates electricity. The stronger the wind, the more electricity produced. There are two types of domestic-sized wind turbine:
- 5.6.3 **Pole mounted:** these are free standing and are erected in a suitably exposed position, often around 5kW to 6Kw
- 5.6.4 **Building mounted:** these are smaller than mast mounted systems and can be installed on the roof of a home where there is a suitable wind resource. Often these are around 1kW to 2kW in size. Wind turbines are eligible for the UK government's Feed-in-Tariffs which means money can be earned from the electricity generated by the turbine. Payments for the electricity not use and export to the local grid are available as well. To be eligible, the installer and wind turbine product must be certified under the Microgeneration Certification Scheme (MCS). If the turbine is not connected to the local electricity grid (known as off grid), unused electricity can be stored in a battery for use when there is no wind. Please note that the Feed-in Tariffs scheme is not available in Northern Ireland.
- 5.6.5 **Wind Turbines have been considered for this project, Pole mounted wind turbine has been excluded due to nature of the development and building mounted would not achieve the required reductions on site to meet the local requirements, therefore this has not been explored further.**

5.7 Biomass

- 5.7.1 Energy from Biomass is produced by burning organic matter. Biomass fuel sources include trees, crops or animal dung are "...harvested and processed to create energy in the form of Electricity, Heat and Steam." (TM38:2006) Biomass is carbon based and when used as a fuel, produces carbon emissions. However, the carbon emitted during the combustion process is "...equivalent to the amount absorbed during growth..." (TM38:2006) The only carbon emissions associated with this energy source is treatment and transportation costs of the fuel to the end user.
- 5.7.2 Carbon savings that can be attributed to this technology type are significant. Biomass boiler installation can "...deliver all of the heating requirements for a building...using an almost carbon neutral fuel source." (TM38:2005) Biomass can be cost effective when directly compared to convention as oil and electricity heating sources. The benefit can be increased when the biomass source, for example wood chips, is diverted from the waste stream. However, maintenance requirements of a biomass system are higher and should be taken into account when installing one. Additionally, the UK introduced the Clean Air Act (1993) (www.uksmokecontrolareas.co.uk) to control the smoke pollution in areas caused by burning of smoky fuels.
- 5.7.3 **Biomass been considered for the project, in order to house the system, an external additional plant area would be required and therefore the feasibility of the CHP has not been deemed acceptable or viable due to planning restrictions. If planning restrictions are limited on Biomass it is recommended to review the financial feasibility as the Biomass option exceeds the planning requirements.**

5.8 Summary of Be Green Measures

Technology	Deemed Viable	Adopted on site
Solar Hot Water Panels (Solar Thermal)	✓	✗
Photovoltaic (PV) Cells	✓	✗
Combined Heat and Power (CHP) and Micro-CHP (mCHP)	✗	✗
Ground Source Heat Pumps (GSHP)	✗	✗
Air Source Heat Pumps (ASHP)	✓	✓
Wind Turbines	✗	✗
Biomass	✗	✗

	Regulated domestic carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: Savings from energy demand reduction	3.5	26%
Be clean: Savings from heat network	0.0	0%
Be green: Savings from renewable energy	1.2	9%
Cumulative on site savings	4.7	35%

	Regulated domestic carbon dioxide	
	(Tonnes CO ₂ per annum)	
Baseline Carbon Emissions (Part L2021 standards)	13.2	
After Be Lean Measures	9.7	
After Be Green Measures	8.5	

6. Conclusion

- 6.1.1 After reviewing the above renewable technologies, **Air Source Heat pump** for units 2 & 4 has been identified as the most viable options to achieve the criteria set out by the local authority. These flats were identified for the ASHP installation given the ground floor installation feasibility and construction characteristics that would efficiently suit the performance of the chosen technology.
- 6.1.2 Gas fed combi boiler has been chosen for all other units to suit on site feasibility and to minimise the carbon emissions when compared to a regular gas boiler and ensure the council reduction targets are met.
- 6.1.3 The development has been deemed viable for additional measures and therefore it is recommended to explore the financial feasibility of these options to maximise the reduction in carbon emissions on site.
- 6.1.4 The key focus on site was to minimise heat loss and reduce the regulated energy consumption on-site through utilisation of the energy hierarchy.

7. Summary of energy efficient measures

Element	U-Value (W/m ² K)
	Development
Existing upgraded wall (Upgraded Element Table 4.3)	0.25
New wall (New Element Table 4.2)	0.18
Flat roof (New Element Table 4.2)	0.14
Bay roof (Upgraded Element Table 4.3)	0.15
Plane roof (Upgraded Element 4.3)	0.11
Existing upgraded floor (Upgraded Element Table 4.3)	0.18
New ground floor (New Element Table 4.2)	0.12
Glazing	1.4
Doors	1.4
Air Permeability	8.00
Low Energy Lighting	75 lm/W
Thermal Bridging (Y-Value)	Default
MVHR	N/A
Waste Water Heat Recovery System	N/A

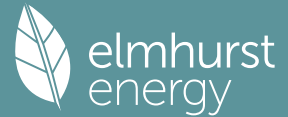
7.1 Summary of renewable or Low Carbon measures

Element	
Main Heating System (Residential)	aroTHERM 5kW
Hot Water System (Residential)	Provided via Main Heating System
Cylinder Volume/Loss (kwh/day)	150/1.80
Renewable Technologies	N/A
Mechanical Ventilation Heat Recovery System	N/A
Waste Water Heat Recovery	N/A

7.2 Appendix 1 – SAP Documents

- 7.2.1 SAP documentation has been included in a separate folder and is to be used in conjunction with this document to validate figures and reductions.

Full SAP Calculation Printout



Plot Reference	Unit 3			Issued on Date	07/06/2026
Assessment Reference	00001	Plot Type Ref			
Plot Address	unit 3, 73-77, Clarence road, wood green, London, N22 8PG			SAP Version	10.2
SAP Rating	80 C	DER	24.55	TER	
Environmental	84 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	1.01	DFEE	51.92	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	135.62	TPER	
Assessor Details	Mr. Ben Whittingham			Assessor ID	EU31-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling	46.2700 (1b)	2.6100 (2b)	120.7647 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	46.2700		120.7647 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 120.7647 (5)

2. Ventilation rate

	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1656 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5656 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4808 (21)

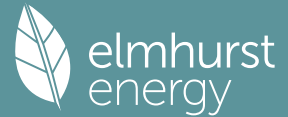
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6130	0.6010	0.5889	0.5288	0.5168	0.4567	0.4567	0.4447	0.4808	0.5168	0.5409	0.5649 (22b)
Effective ac	0.6879	0.6806	0.6734	0.6398	0.6336	0.6043	0.6043	0.5989	0.6156	0.6336	0.6463	0.6596 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
windows			6.2500	1.3258	8.2860		(27)
door			2.1700	1.4000	3.0380		(26)
existing floor			46.2700	0.1800	8.3286	110.0000	5089.7000 (28a)
existing wall	29.1300	8.4200	20.7100	0.2500	5.1775	190.0000	3934.9000 (29a)
Total net area of external elements Aum(A, m ²)			75.4000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	24.8301		(33)
Main dwelling							
Party Wall 1			36.7500	0.0000	0.0000	20.0000	735.0000 (32)
Party Wall 2			14.3300	0.0000	0.0000	20.0000	286.6000 (32)
Party Ceiling 1			46.2700			20.0000	925.4000 (32b)
Internal Wall 1			70.7300			9.0000	636.5700 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	11608.1700 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.8790 (35)
Thermal bridges (Default value 0.200 * total exposed area)							15.0800 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	39.9101 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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(38)m	27.4134	27.1226	26.8376	25.4991	25.2487	24.0828	24.0828	23.8669	24.5319	25.2487	25.7553	26.2850 (38)
Heat transfer coeff	67.3234	67.0327	66.7477	65.4092	65.1588	63.9929	63.9929	63.7770	64.4420	65.1588	65.6654	66.1950 (39)
Average = Sum(39)m / 12 =												65.4080
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.4550	1.4487	1.4426	1.4136	1.4082	1.3830	1.3830	1.3784	1.3927	1.4082	1.4192	1.4306 (40)
HLP (average)												1.4136
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.5811 (42)
Hot water usage for mixer showers												
89.5062	88.1611	86.2010	82.4507	79.6831	76.5967	74.8424	76.7877	78.9200	82.2339	86.0647	89.1632 (42a)	
Hot water usage for baths												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)	
Hot water usage for other uses												
30.8224	29.7016	28.5808	27.4600	26.3391	25.2183	25.2183	26.3391	27.4600	28.5808	29.7016	30.8224 (42c)	
Average daily hot water use (litres/day)												110.5421 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	120.3286	117.8627	114.7818	109.9107	106.0223	101.8151	100.0608	103.1268	106.3800	110.8147	115.7663	119.9856 (44)
Energy conte	190.5711	167.8349	176.4153	150.4622	142.7264	125.1935	121.0148	127.6925	131.1772	150.3744	164.9303	187.8685 (45)
Energy content (annual)										Total = Sum(45)m =		1836.2611
Distribution loss (46)m = 0.15 x (45)m												
28.5857	25.1752	26.4623	22.5693	21.4090	18.7790	18.1522	19.1539	19.6766	22.5562	24.7395	28.1803 (46)	
Water storage loss (or HIU loss):												
Total storage loss												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)	
If cylinder contains dedicated solar storage												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)	
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)	
Combi loss	50.9589	46.0274	50.9589	49.3151	50.9589	49.3151	50.9589	50.9589	49.3151	50.9589	49.3151	50.9589 (61)
Total heat required for water heating calculated for each month												
241.5300	213.8623	227.3742	199.7773	193.6853	174.5086	171.9737	178.6514	180.4922	201.3333	214.2454	238.8274 (62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)	
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)	
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)	
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)	
Output from w/h												
241.5300	213.8623	227.3742	199.7773	193.6853	174.5086	171.9737	178.6514	180.4922	201.3333	214.2454	238.8274 (64)	
12Total per year (kWh/year)									Total per year (kWh/year) = Sum(64)m =			2436.2611 (64)
Electric shower(s)												2436 (64)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)	
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)
Heat gains from water heating, kWh/month												
76.1046	67.3119	71.3978	62.3575	60.1962	53.9556	52.9772	55.1975	55.9452	62.7392	67.1681	75.2060 (65)	

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	79.0568	79.0568	79.0568	79.0568	79.0568	79.0568	79.0568	79.0568	79.0568	79.0568	79.0568	79.0568 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	75.0208	83.0588	75.0208	77.5215	75.0208	77.5215	75.0208	75.0208	77.5215	75.0208	77.5215	75.0208 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	137.5598	138.9873	135.3902	127.7324	118.0658	108.9805	102.9110	101.4836	105.0807	112.7385	122.4051	131.4903 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	30.9057	30.9057	30.9057	30.9057	30.9057	30.9057	30.9057	30.9057	30.9057	30.9057	30.9057	30.9057 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454	-63.2454 (71)
Water heating gains (Table 5)	102.2911	100.1666	95.9648	86.6076	80.9089	74.9383	71.2058	74.1902	77.7016	84.3269	93.2890	101.0833 (72)
Total internal gains	364.5888	371.9296	356.0928	341.5785	323.7125	308.1574	295.8547	297.4116	307.0208	321.8032	342.9326	357.3115 (73)

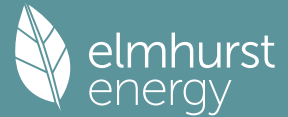
6. Solar gains

[Jan]												Gains
					Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b		FF Specific data or Table 6c		Access factor Table 6d	W
Southeast					3.8200	36.7938	0.6300		0.7000		0.7700	42.9547 (77)
Southwest					2.4300	36.7938	0.6300		0.7000		0.7700	27.3246 (79)
Solar gains	70.2792	119.7115	163.7945	202.9493	227.3201	225.6763	217.5760	199.3943	177.3548	132.3067	84.1783	60.1444 (83)
Total gains	434.8680	491.6411	519.8873	544.5278	551.0327	533.8337	513.4307	496.8059	484.3756	454.1099	427.1109	417.4559 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	47.8955	48.1033	48.3086	49.2972	49.4867	50.3883	50.3883	50.5588	50.0371	49.4867	49.1049	48.7120
alpha	4.1930	4.2069	4.2206	4.2865	4.2991	4.3592	4.3592	4.3706	4.3358	4.2991	4.2737	4.2475
util living area												
	0.9885	0.9797	0.9650	0.9271	0.8477	0.6930	0.5296	0.5648	0.7763	0.9329	0.9789	0.9902 (86)
MIT	19.4798	19.6905	19.9774	20.3681	20.6936	20.9122	20.9786	20.9717	20.8481	20.4395	19.9104	19.4640 (87)
Th 2	19.7214	19.7262	19.7308	19.7529	19.7570	19.7764	19.7764	19.7800	19.7689	19.7570	19.7487	19.7399 (88)
util rest of house												
	0.9847	0.9732	0.9531	0.9009	0.7911	0.5886	0.3917	0.4274	0.6841	0.9034	0.9708	0.9870 (89)
MIT 2	18.3861	18.5967	18.8805	19.2693	19.5605	19.7386	19.7715	19.7728	19.6937	19.3456	18.8325	18.3844 (90)

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Living area fraction									fLA = Living area / (4) =	0.5174 (91)		
MIT	18.9520	19.1626	19.4480	19.8378	20.1468	20.3458	20.3961	20.3931	20.2910	19.9116	19.3902	18.9430 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.8020	19.0126	19.2980	19.6878	19.9968	20.1958	20.2461	20.2431	20.1410	19.7616	19.2402	18.7930 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9810	0.9684	0.9480	0.8992	0.8035	0.6269	0.4464	0.4817	0.7148	0.9035	0.9665	0.9837	(94)
Useful gains	426.6239	476.0818	492.8441	489.6504	442.7327	334.6575	229.1727	239.3096	346.2547	410.2958	412.8059	410.6546	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	976.3229	946.0082	854.2398	705.6211	540.6065	358.0948	233.3227	245.1021	389.2944	596.9572	797.1926	965.9832	(97)
Space heating kWh	408.9760	315.7905	268.8784	155.4989	72.8181	0.0000	0.0000	0.0000	0.0000	138.8761	276.7584	413.1645	(98a)
Space heating requirement - total per year (kWh/year)												2050.7608	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	408.9760	315.7905	268.8784	155.4989	72.8181	0.0000	0.0000	0.0000	0.0000	138.8761	276.7584	413.1645	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2050.7608	
Space heating per m2										(98c) / (4) =		44.3216	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													88.4000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	408.9760	315.7905	268.8784	155.4989	72.8181	0.0000	0.0000	0.0000	0.0000	138.8761	276.7584	413.1645	(98)
Space heating efficiency (main heating system 1)	88.4000	88.4000	88.4000	88.4000	88.4000	0.0000	0.0000	0.0000	0.0000	88.4000	88.4000	88.4000	(210)
Space heating fuel (main heating system)	462.6426	357.2291	304.1611	175.9037	82.3734	0.0000	0.0000	0.0000	0.0000	157.0996	313.0751	467.3806	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	241.5300	213.8623	227.3742	199.7773	193.6853	174.5086	171.9737	178.6514	180.4922	201.3333	214.2454	238.8274	(64)
Efficiency of water heater	84.9988	84.7137	84.2404	83.3490	81.9791	79.8000	79.8000	79.8000	79.8000	83.1001	84.4298	85.0428	(216)
Fuel for water heating, kWh/month	284.1568	252.4530	269.9112	239.6877	236.2616	218.6824	215.5059	223.8740	226.1807	242.2781	253.7558	280.8320	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	15.9489	12.7948	11.5203	8.4403	6.5195	5.3265	5.9473	7.7306	10.0412	13.1746	14.8807	16.3922	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												2319.8652	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												79.8000	
Water heating fuel used												2943.5792	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
central heating pump												41.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												128.7170	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												0.0000	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												5478.1614	(238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2319.8652	0.2100	487.1717	(261)

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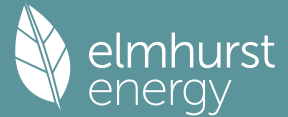


Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2943.5792	0.2100	618.1516 (264)
Space and water heating			1105.3233 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	128.7170	0.1443	18.5778 (268)
Total CO2, kg/year			1135.8304 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			24.5500 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	2319.8652	1.1300	2621.4477 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2943.5792	1.1300	3326.2445 (278)
Space and water heating			5947.6922 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	128.7170	1.5338	197.4305 (282)
Total Primary energy kWh/year			6275.2234 (286)
Dwelling Primary energy Rate (DPER)			135.6200 (287)

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Plot Reference	Unit 4			Issued on Date	07/06/2026
Assessment Reference	00001	Plot Type Ref			
Plot Address	Unit 4 , 73-77, Clarence road, Wood green, London, N22 8PG			SAP Version	10.2
SAP Rating	72 C	DER	7.55	TER	
Environmental	94 A	% DER < TER			N/A
CO ₂ Emissions (t/year)	0.41	DFEE	65.96	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	79.13	TPER	
Assessor Details	Mr. Ben Whittingham			Assessor ID	EU31-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling	60.8500 (1b)	2.6100 (2b)	158.8185 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	60.8500		158.8185 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 158.8185 (5)

2. Ventilation rate

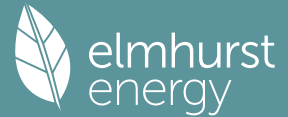
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1259 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5259 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4470 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.5700	0.5588	0.5476	0.4917	0.4806	0.4247	0.4247	0.4135	0.4470	0.4806	0.5029	0.5253 (22b)
Effective ac	0.6624	0.6561	0.6499	0.6209	0.6155	0.5902	0.5902	0.5855	0.5999	0.6155	0.6265	0.6380 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
windows			8.0900	1.3258	10.7254		(27)
door			2.1100	1.4000	2.9540		(26)
new floor			41.8200	0.1200	5.0184	110.0000	4600.2000 (28a)
existing floor			19.0300	0.1800	3.4254	110.0000	2093.3000 (28a)
External Wall 1	49.3000	10.2000	39.1000	0.1800	7.0380	140.0000	5474.0000 (29a)
External Roof 1	42.9200		42.9200	0.1400	6.0088	9.0000	386.2800 (30)
Total net area of external elements Aum(A, m ²)			153.0700				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	35.1700		(33)
Main dwelling							
Party Wall 1			34.0300	0.0000	0.0000	20.0000	680.6000 (32)
Party Ceiling 1			17.9300			20.0000	358.6000 (32b)
Internal Wall 1			110.7200			9.0000	996.4800 (32c)
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		14589.4600 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							239.7611 (35)
Thermal bridges (Default value 0.200 * total exposed area)							30.6140 (36)
Point Thermal Bridges						(36a) =	0.0000
Total fabric heat loss					(33) + (36) + (36a) =		65.7840 (37)
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)							

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(38)m	Jan 34.7184	Feb 34.3878	Mar 34.0638	Apr 32.5418	May 32.2570	Jun 30.9314	Jul 30.9314	Aug 30.6859	Sep 31.4420	Oct 32.2570	Nov 32.8331	Dec 33.4353	(38)
Heat transfer coeff	100.5024	100.1718	99.8477	98.3257	98.0410	96.7154	96.7154	96.4699	97.2260	98.0410	98.6170	99.2193	(39)
Average = Sum(39)m / 12 =												98.3244	
HLP	Jan 1.6516	Feb 1.6462	Mar 1.6409	Apr 1.6159	May 1.6112	Jun 1.5894	Jul 1.5894	Aug 1.5854	Sep 1.5978	Oct 1.6112	Nov 1.6207	Dec 1.6306	(40)
HLP (average)												1.6158	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.0056	(42)
Hot water usage for mixer showers														
79.5386	78.3433	76.6015	73.2689	70.8095	68.0668	66.5079	68.2365	70.1314	73.0762	76.4804	79.2339	79.2339	(42a)	
Hot water usage for baths														
24.9990	24.6277	24.1049	23.1409	22.4191	21.6187	21.1864	21.7055	22.2708	23.1273	24.1111	24.9145	24.9145	(42b)	
Hot water usage for other uses														
35.1690	33.8901	32.6112	31.3324	30.0535	28.7746	28.7746	30.0535	31.3324	32.6112	33.8901	35.1690	35.1690	(42c)	
Average daily hot water use (litres/day)												128.4818	(43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Daily hot water use														
139.7066	136.8612	133.3176	127.7422	123.2821	118.4601	116.4688	119.9955	123.7345	128.8147	134.4816	139.3173	139.3173	(44)	
Energy conte	221.2611	194.8885	204.9043	174.8726	165.9613	145.6605	140.8589	148.5795	152.5770	174.8003	191.5937	218.1373	(45)	
Energy content (annual)										Total = Sum(45)m =		2134.0950		
Distribution loss (46)m = 0.15 x (45)m														
33.1892	29.2333	30.7356	26.2309	24.8942	21.8491	21.1288	22.2869	22.8866	26.2200	28.7391	32.7206	32.7206	(46)	
Water storage loss (or HIU loss):														
Store volume												150.0000	(47)	
a) If manufacturer declared loss factor is known (kWh/day):												1.8000	(48)	
Temperature factor from Table 2b												0.5400	(49)	
Enter (49) or (54) in (55)												0.9720	(55)	
Total storage loss														
30.1320	27.2160	30.1320	29.1600	30.1320	29.1600	30.1320	30.1320	29.1600	30.1320	29.1600	30.1320	30.1320	(56)	
If cylinder contains dedicated solar storage														
30.1320	27.2160	30.1320	29.1600	30.1320	29.1600	30.1320	30.1320	29.1600	30.1320	29.1600	30.1320	30.1320	(57)	
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624	(59)	
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(61)	
Total heat required for water heating calculated for each month														
274.6555	243.1157	258.2987	226.5446	219.3557	197.3325	194.2533	201.9739	204.2490	228.1947	243.2657	271.5317	271.5317	(62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)	
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)	
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)	
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)	
Output from w/h														
274.6555	243.1157	258.2987	226.5446	219.3557	197.3325	194.2533	201.9739	204.2490	228.1947	243.2657	271.5317	271.5317	(64)	
12Total per year (kWh/year)												2762.7710	(64)	
Electric shower(s)												2763	(64)	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)	
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000	(64a)	
Heat gains from water heating, kWh/month														
116.2848	103.3822	110.8462	99.4827	97.8977	89.7697	89.5511	92.1182	92.0695	100.8366	105.0425	115.2462	115.2462	(65)	

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts													
(66)m	Jan 100.2781	Feb 100.2781	Mar 100.2781	Apr 100.2781	May 100.2781	Jun 100.2781	Jul 100.2781	Aug 100.2781	Sep 100.2781	Oct 100.2781	Nov 100.2781	Dec 100.2781	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
95.8206	106.0871	95.8206	99.0146	95.8206	99.0146	95.8206	95.8206	99.0146	95.8206	99.0146	95.8206	95.8206	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
175.0855	176.9023	172.3239	162.5771	150.2735	138.7098	130.9846	129.1678	133.7461	143.4930	155.7966	167.3602	167.3602	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	33.0278	(69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)													
-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	-80.2225	(71)
Water heating gains (Table 5)													
156.2968	153.8425	148.9868	138.1705	131.5829	124.6802	120.3644	123.8148	127.8743	135.5331	145.8924	154.9008	154.9008	(72)
Total internal gains													
480.2863	489.9154	470.2148	452.8457	430.7604	415.4881	400.2531	401.8866	413.7185	427.9301	453.7870	471.1651	471.1651	(73)

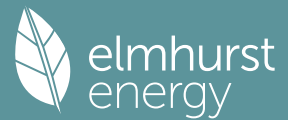
6. Solar gains

[Jan]													
					Area m2	Solar flux Table 6a W/m2		g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d		Gains W	
Northeast					4.0400	11.2829		0.6300	0.7000	0.7700		13.9308 (75)	
Southeast					4.0500	36.7938		0.6300	0.7000	0.7700		45.5409 (77)	
Solar gains	59.4717	105.9296	157.2282	215.4146	260.0862	266.4766	253.4698	218.8783	177.1792	120.3886	72.0761	50.3501	(83)
Total gains	539.7581	595.8449	627.4430	668.2603	690.8467	681.9647	653.7228	620.7649	590.8976	548.3187	525.8631	521.5152	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)	
Utilisation factor for gains for living area, nil,m (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	40.3237	40.4568	40.5881	41.2163	41.3361	41.9026	41.9026	42.0092	41.6826	41.3361	41.0946	40.8452	
alpha	3.6882	3.6971	3.7059	3.7478	3.7557	3.7935	3.7935	3.8006	3.7788	3.7557	3.7396	3.7230	
util living area													
	0.9896	0.9840	0.9739	0.9461	0.8834	0.7514	0.5999	0.6438	0.8377	0.9525	0.9827	0.9909	(86)

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Living	19.0965	19.2908	19.6055	20.0668	20.4949	20.8209	20.9438	20.9257	20.7048	20.1669	19.5717	19.0798
Non living	17.4348	17.6836	18.0840	18.6689	19.1755	19.5176	19.6043	19.5989	19.4155	18.8027	18.0544	17.4231
24 / 16	0	0	0	0	0	0	0	0	0	0	0	0
24 / 9	3	0	0	0	0	0	0	0	0	0	0	0
16 / 9	28	0	0	0	0	0	0	0	0	0	0	10
MIT	20.0263	19.2908	19.6055	20.0668	20.4949	20.8209	20.9438	20.9257	20.7048	20.1669	19.5717	19.3484 (87)
Th 2	19.5757	19.5796	19.5835	19.6017	19.6051	19.6211	19.6211	19.6241	19.6149	19.6051	19.5982	19.5910 (88)
util rest of house												
MIT 2	0.9862	0.9786	0.9646	0.9247	0.8326	0.6417	0.4351	0.4823	0.7507	0.9293	0.9759	0.9879 (89)
Living area fraction	18.7222	17.6836	18.0840	18.6689	19.1755	19.5176	19.6043	19.5989	19.4155	18.8027	18.0544	17.8138 (90)
MIT	19.2766	18.3669	18.7309	19.2632	19.7365	20.0717	20.1738	20.1630	19.9636	19.3827	18.6995	18.4662 (91)
Temperature adjustment												0.0000
adjusted MIT	19.2766	18.3669	18.7309	19.2632	19.7365	20.0717	20.1738	20.1630	19.9636	19.3827	18.6995	18.4662 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	0.9853	0.9722	0.9569	0.9181	0.8383	0.6816	0.5054	0.5506	0.7763	0.9245	0.9697	0.9845	(94)
Useful gains	531.8115	579.2710	600.4083	613.5540	579.1044	464.8098	330.4031	341.7829	458.7397	506.9135	509.9277	513.4400	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1505.1837	1349.0058	1221.2267	1018.9700	787.9029	529.1940	345.6417	363.0169	570.0938	861.0615	1143.9067	1415.4826	(97)
Space heating kWh	724.1889	517.2618	461.8890	291.8995	155.3461	0.0000	0.0000	0.0000	0.0000	263.4861	456.4649	671.1197	(98a)
Space heating requirement - total per year (kWh/year)												3541.6559	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	724.1889	517.2618	461.8890	291.8995	155.3461	0.0000	0.0000	0.0000	0.0000	263.4861	456.4649	671.1197	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3541.6559	
Space heating per m2										(98c) / (4) =		58.2031	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													249.3317 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	724.1889	517.2618	461.8890	291.8995	155.3461	0.0000	0.0000	0.0000	0.0000	263.4861	456.4649	671.1197	(98)
Space heating efficiency (main heating system 1)	249.3317	249.3317	249.3317	249.3317	249.3317	0.0000	0.0000	0.0000	0.0000	249.3317	249.3317	249.3317	(210)
Space heating fuel (main heating system)	290.4520	207.4593	185.2508	117.0727	62.3050	0.0000	0.0000	0.0000	0.0000	105.6769	183.0753	269.1674	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	274.6555	243.1157	258.2987	226.5446	219.3557	197.3325	194.2533	201.9739	204.2490	228.1947	243.2657	271.5317	(64)
Efficiency of water heater (217)m	180.4322	180.4322	180.4322	180.4322	180.4322	180.4322	180.4322	180.4322	180.4322	180.4322	180.4322	180.4322	(216)
Fuel for water heating, kWh/month	152.2209	134.7407	143.1555	125.5566	121.5724	109.3666	107.6600	111.9389	113.1999	126.4712	134.8239	150.4896	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	20.3708	16.3422	14.7144	10.7804	8.3271	6.8033	7.5962	9.8739	12.8252	16.8273	19.0064	20.9370	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												1420.4593	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												180.4322	
Water heating fuel used												1531.1962	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year												0.0000	(231)
Electricity for lighting (calculated in Appendix L)												164.4043	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												0.0000	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												3116.0598	(238)

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12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	1420.4593	0.1547	219.7369 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	1531.1962	0.1409	215.7856 (264)
Space and water heating			435.5224 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	164.4043	0.1443	23.7286 (268)
Total CO2, kg/year			459.2511 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			7.5500 (273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	1420.4593	1.5727	2233.9425 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	1531.1962	1.5211	2329.0953 (278)
Space and water heating			4563.0378 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	164.4043	1.5338	252.1688 (282)
Total Primary energy kWh/year			4815.2066 (286)
Dwelling Primary energy Rate (DPER)			79.1300 (287)

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Plot Reference	Unit 5			Issued on Date	07/06/2026	
Assessment Reference	00001		Plot Type Ref			
Plot Address	Unit 5, 73-77, Clarence Road, Wood green, London, N22 8PG			SAP Version	10.2	
SAP Rating	81 B	DER	20.00	TER		
Environmental	83 B	% DER < TER				N/A
CO ₂ Emissions (t/year)	1.41	DFEE	48.58	TFEE		
Compliance Check	N/A	% DFEE < TFEE				
% DPER < TPER		DPER	110.63	TPER		
Assessor Details	Mr. Ben Whittingham			Assessor ID	EU31-0001	
Client						

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	79.7300 (1b)	2.4100 (2b)	192.1493 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	79.7300		192.1493 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	192.1493 (5)

2. Ventilation rate

	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	20.0000 / (5) = 0.1041 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5041 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4285 (21)

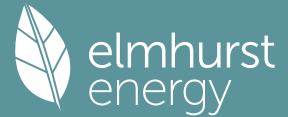
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.5463	0.5356	0.5249	0.4713	0.4606	0.4070	0.4070	0.3963	0.4285	0.4606	0.4820	0.5035 (22b)
Effective ac	0.6492	0.6434	0.6377	0.6111	0.6061	0.5828	0.5828	0.5785	0.5918	0.6061	0.6162	0.6267 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
windows			6.0300	1.3258	7.9943		(27)
HG door			3.3300	1.4000	4.6620		(26a)
new wall	7.9300	3.3300	4.6000	0.1800	0.8280	140.0000	644.0000 (29a)
existing wall	51.5000	6.0300	45.4700	0.2500	11.3675	190.0000	8639.3000 (29a)
External Roof 1	79.7300		79.7300	0.1100	8.7703	9.0000	717.5700 (30)
Total net area of external elements Aum(A, m ²)			139.1600				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	33.6221		(33)
Main dwelling							
Party Wall 1			35.0600	0.0000	0.0000	20.0000	701.2000 (32)
Party Floor 1			79.7300			30.0000	2391.9000 (32d)
Internal Wall 1			127.5900			9.0000	1148.3100 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 14242.2800 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							178.6314 (35)
Thermal bridges (Default value 0.200 * total exposed area)							27.8320 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	61.4541 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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(38)m	41.1668	40.7994	40.4392	38.7476	38.4311	36.9577	36.9577	36.6849	37.5253	38.4311	39.0714	39.7407 (38)
Heat transfer coeff	102.6209	102.2535	101.8933	100.2017	99.8852	98.4119	98.4119	98.1390	98.9794	99.8852	100.5255	101.1948 (39)
Average = Sum(39)m / 12 =												100.2002

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.2871	1.2825	1.2780	1.2568	1.2528	1.2343	1.2343	1.2309	1.2414	1.2528	1.2608	1.2692 (40)
HLP (average)												1.2567
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.4577 (42)
Hot water usage for mixer showers												
Hot water usage for baths	115.5537	113.8172	111.2867	106.4450	102.8720	98.8874	96.6226	99.1339	101.8868	106.1651	111.1107	115.1110 (42a)
Hot water usage for other uses	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)
Average daily hot water use (litres/day)	39.7995	38.3522	36.9050	35.4577	34.0105	32.5632	32.5632	34.0105	35.4577	36.9050	38.3522	39.7995 (42c)
												142.7180 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	155.3532	152.1694	148.1916	141.9028	136.8825	131.4507	129.1858	133.1444	137.3446	143.0700	149.4629	154.9105 (44)
Energy conte	246.0415	216.6872	227.7650	194.2578	184.2701	161.6339	156.2391	164.8606	169.3596	194.1447	212.9374	242.5523 (45)
Energy content (annual)												
Distribution loss (46)m = 0.15 x (45)m	36.9062	32.5031	34.1648	29.1387	27.6405	24.2451	23.4359	24.7291	25.4039	29.1217	31.9406	36.3829 (46)
Water storage loss (or HIU loss):												
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage												
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Combi loss	50.9589	46.0274	50.9589	49.3151	50.9589	49.3151	50.9589	50.9589	49.3151	50.9589	49.3151	50.9589 (61)
Total heat required for water heating calculated for each month	297.0004	262.7146	278.7239	243.5728	235.2291	210.9490	207.1980	215.8195	218.6746	245.1036	262.2524	293.5112 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	297.0004	262.7146	278.7239	243.5728	235.2291	210.9490	207.1980	215.8195	218.6746	245.1036	262.2524	293.5112 (64)
12Total per year (kWh/year)												2970.7492 (64)
Electric shower(s)												2971 (64)
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
												0.0000 (64a)
Heat gains from water heating, kWh/month	94.5485	83.5553	88.4716	76.9195	74.0096	66.0720	64.6892	67.5559	68.6408	77.2928	83.1304	93.3884 (65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	122.8859	122.8859	122.8859	122.8859	122.8859	122.8859	122.8859	122.8859	122.8859	122.8859	122.8859	122.8859 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	134.6356	149.0608	134.6356	139.1234	134.6356	139.1234	134.6356	134.6356	139.1234	134.6356	139.1234	134.6356 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	218.8753	221.1466	215.4231	203.2386	187.8577	173.4019	163.7446	161.4733	167.1968	179.3814	194.7622	209.2180 (68)
Pumps, fans	35.2886	35.2886	35.2886	35.2886	35.2886	35.2886	35.2886	35.2886	35.2886	35.2886	35.2886	35.2886 (69)
Losses e.g. evaporation (negative values) (Table 5)	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000 (70)
Water heating gains (Table 5)	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087	-98.3087 (71)
Total internal gains	127.0813	124.3383	118.9134	106.8326	99.4752	91.7667	86.9479	90.8009	95.3345	103.8882	115.4589	125.5220 (72)
	543.4580	557.4114	531.8379	512.0603	484.8343	464.1579	445.1938	446.7756	461.5205	480.7709	512.2103	532.2413 (73)

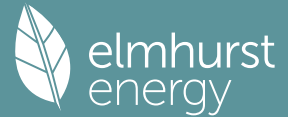
6. Solar gains

[Jan]					Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W		
Southwest					4.5300	36.7938	0.6300	0.7000	0.7700	50.9384 (79)		
Northwest					1.5000	11.2829	0.6300	0.7000	0.7700	5.1723 (81)		
Solar gains	56.1107	97.2953	137.6871	178.2499	206.6364	208.2131	199.4617	177.8146	151.6606	108.7624	67.5205	47.8166 (83)
Total gains	599.5687	654.7067	669.5250	690.3103	691.4707	672.3710	644.6554	624.5902	613.1810	589.5334	579.7308	580.0579 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
alpha	38.5515	38.6900	38.8268	39.4823	39.6074	40.2003	40.2003	40.3121	39.9698	39.6074	39.3551	39.0948
util living area	3.5701	3.5793	3.5885	3.6322	3.6405	3.6800	3.6800	3.6875	3.6647	3.6405	3.6237	3.6063
	0.9846	0.9775	0.9672	0.9399	0.8830	0.7599	0.6113	0.6454	0.8258	0.9407	0.9754	0.9863 (86)
MIT	19.1102	19.3055	19.6011	20.0453	20.4603	20.7976	20.9338	20.9176	20.6998	20.1791	19.5924	19.0948 (87)
Th 2	19.8509	19.8546	19.8581	19.8749	19.8780	19.8926	19.8926	19.8954	19.8870	19.8780	19.8716	19.8650 (88)
util rest of house	0.9808	0.9720	0.9586	0.9224	0.8446	0.6768	0.4819	0.5203	0.7581	0.9201	0.9684	0.9829 (89)
MIT 2	18.1558	18.3512	18.6456	19.0907	19.4832	19.7807	19.8699	19.8646	19.7035	19.2265	18.6491	18.1506 (90)

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Living area fraction									fLA = Living area / (4) =		0.2477 (91)	
MIT	18.3922	18.5876	18.8823	19.3272	19.7253	20.0326	20.1334	20.1254	19.9503	19.4624	18.8828	18.3845 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.2422	18.4376	18.7323	19.1772	19.5753	19.8826	19.9834	19.9754	19.8003	19.3124	18.7328	18.2345 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9735	0.9627	0.9472	0.9085	0.8320	0.6760	0.4935	0.5303	0.7518	0.9065	0.9587	0.9762	(94)
Useful gains	583.6583	630.2553	634.1621	627.1764	575.2904	454.4987	318.1416	331.2321	460.9856	534.4204	555.8037	566.2503	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1430.7604	1384.2645	1246.3910	1029.7918	786.6224	519.8664	332.9701	350.8902	564.2126	870.2431	1169.3891	1420.2193	(97)
Space heating kWh	630.2440	506.6942	455.4983	289.8831	157.2310	0.0000	0.0000	0.0000	0.0000	249.8521	441.7815	635.3530	(98a)
Space heating requirement - total per year (kWh/year)												3366.5371	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	630.2440	506.6942	455.4983	289.8831	157.2310	0.0000	0.0000	0.0000	0.0000	249.8521	441.7815	635.3530	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3366.5371	
Space heating per m2										(98c) / (4) =		42.2242	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													88.4000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	630.2440	506.6942	455.4983	289.8831	157.2310	0.0000	0.0000	0.0000	0.0000	249.8521	441.7815	635.3530	(98)
Space heating efficiency (main heating system 1)	88.4000	88.4000	88.4000	88.4000	88.4000	0.0000	0.0000	0.0000	0.0000	88.4000	88.4000	88.4000	(210)
Space heating fuel (main heating system)	712.9457	573.1835	515.2696	327.9220	177.8631	0.0000	0.0000	0.0000	0.0000	282.6381	499.7529	718.7251	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	297.0004	262.7146	278.7239	243.5728	235.2291	210.9490	207.1980	215.8195	218.6746	245.1036	262.2524	293.5112	(64)
Efficiency of water heater													79.8000 (216)
(217)m	85.4503	85.2625	84.9256	84.2541	83.0364	79.8000	79.8000	79.8000	79.8000	83.9213	84.9882	85.4888	(217)
Fuel for water heating, kWh/month	347.5708	308.1243	328.1978	289.0931	283.2844	264.3471	259.6466	270.4505	274.0284	292.0636	308.5750	343.3331	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	28.6226	22.9621	20.6749	15.1473	11.7002	9.5592	10.6733	13.8736	18.0204	23.6438	26.7056	29.4181	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												3808.2999	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												79.8000	
Water heating fuel used												3568.7147	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
central heating pump												41.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												231.0011	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												0.0000	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												7694.0157	(238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	3808.2999	0.2100	799.7430	(261)

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Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	3568.7147	0.2100	749.4301 (264)
Space and water heating			1549.1731 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	231.0011	0.1443	33.3406 (268)
Total CO2, kg/year			1594.4429 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			20.0000 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year	
Space heating - main system 1	3808.2999	1.1300	4303.3789	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	3568.7147	1.1300	4032.6476	(278)
Space and water heating			8336.0265	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	231.0011	1.5338	354.3171	(282)
Total Primary energy kWh/year			8820.4444	(286)
Dwelling Primary energy Rate (DPER)			110.6300	(287)

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Plot Reference	Unit 6			Issued on Date	07/06/2026
Assessment Reference	00001	Plot Type Ref			
Plot Address	Unit 6, 73-77, Clarence Road, Wood green, London, N22 8PG			SAP Version	10.2
SAP Rating	79 C	DER	27.90	TER	
Environmental	83 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	0.99	DFEE	60.70	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	153.90	TPER	
Assessor Details	Mr. Ben Whittingham			Assessor ID	EU31-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling	39.7000 (1b)	2.4100 (2b)	95.6770 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.7000		95.6770 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 95.6770 (5)

2. Ventilation rate

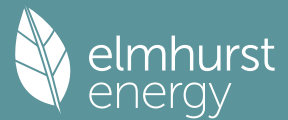
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.2090 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.6090 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.5177 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.6600	0.6471	0.6342	0.5694	0.5565	0.4918	0.4918	0.4789	0.5177	0.5565	0.5824	0.6083 (22b)
Effective ac	0.7178	0.7094	0.7011	0.6621	0.6549	0.6209	0.6209	0.6147	0.6340	0.6549	0.6696	0.6850 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K					
Main dwelling												
windows			8.0000	1.3258	10.6061		(27)					
new wall	21.0800	3.2000	17.8800	0.1800	3.2184	140.0000	2503.2000 (29a)					
existing wall	23.1800	4.8000	18.3800	0.2500	4.5950	190.0000	3492.2000 (29a)					
External Roof 1	39.7000		39.7000	0.1100	4.3670	9.0000	357.3000 (30)					
Total net area of external elements Aum(A, m2)			83.9600				(31)					
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	22.7865		(33)					
Main dwelling												
Party Wall 1			22.8000	0.0000	0.0000	20.0000	456.0000 (32)					
Party Floor 1			39.7000			30.0000	1191.0000 (32d)					
Internal Wall 1			33.6400			9.0000	302.7600 (32c)					
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	8302.4600 (34)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							209.1300 (35)					
Thermal bridges (Default value 0.200 * total exposed area)							16.7920 (36)					
Point Thermal bridges						(36a) =	0.0000					
Total fabric heat loss						(33) + (36) + (36a) =	39.5785 (37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	22.6643	22.3972	22.1355	20.9059	20.6759	19.6049	19.6049	19.4066	20.0174	20.6759	21.1412	21.6278 (38)

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Heat transfer coeff	62.2428	61.9757	61.7139	60.4844	60.2543	59.1834	59.1834	58.9851	59.5959	60.2543	60.7197	61.2062 (39)
Average = Sum(39)m / 12 =												60.4833
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.5678	1.5611	1.5545	1.5235	1.5177	1.4908	1.4908	1.4858	1.5012	1.5177	1.5295	1.5417 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.3984 (42)
Hot water usage for mixer showers												
84.0758	82.8123	80.9711	77.4484	74.8487	71.9496	70.3017	72.1289	74.1319	77.2447	80.8431	83.7536 (42a)	
Hot water usage for baths												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)	
Hot water usage for other uses												
28.9509	27.8981	26.8453	25.7926	24.7398	23.6871	23.6871	24.7398	25.7926	26.8453	27.8981	28.9509 (42c)	
Average daily hot water use (litres/day)												103.8340 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	113.0266	110.7104	107.8165	103.2410	99.5885	95.6366	93.9888	96.8687	99.9245	104.0900	108.7412	112.7045 (44)
Energy conte	179.0066	157.6501	165.7099	141.3317	134.0653	117.5964	113.6713	119.9437	123.2169	141.2492	154.9218	176.4680 (45)
Energy content (annual)										Total = Sum(45)m =		1724.8309
Distribution loss (46)m = 0.15 x (45)m												
26.8510	23.6475	24.8565	21.1998	20.1098	17.6395	17.0507	17.9916	18.4825	21.1874	23.2383	26.4702 (46)	
Water storage loss (or HIU loss):												
Total storage loss												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)	
If cylinder contains dedicated solar storage												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)	
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)	
Combi loss	50.9589	46.0274	50.9589	49.3151	50.7492	47.1633	47.8956	49.3632	49.2778	50.9589	49.3151	50.9589 (61)
Total heat required for water heating calculated for each month												
229.9655	203.6775	216.6688	190.6468	184.8145	164.7597	161.5669	169.3070	172.4947	192.2081	204.2368	227.4269 (62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)	
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)	
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)	
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)	
Output from w/h	229.9655	203.6775	216.6688	190.6468	184.8145	164.7597	161.5669	169.3070	172.4947	192.2081	204.2368	227.4269 (64)
12Total per year (kWh/year)												2317.7732 (64)
Electric shower(s)												2318 (64)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)	
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)
Heat gains from water heating, kWh/month												
72.2594	63.9255	67.8383	59.3216	57.2640	50.8916	49.7696	52.2221	53.2891	59.7051	63.8403	71.4153 (65)	

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m	69.9193	69.9193	69.9193	69.9193	69.9193	69.9193	69.9193	69.9193	69.9193	69.9193	69.9193	69.9193	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	61.3016	67.8696	61.3016	63.3449	61.3016	63.3449	61.3016	61.3016	63.3449	61.3016	63.3449	61.3016	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	120.7797	122.0330	118.8747	112.1510	103.6636	95.6866	90.3574	89.1041	92.2624	98.9861	107.4735	115.4505	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	29.9919	29.9919	29.9919	29.9919	29.9919	29.9919	29.9919	29.9919	29.9919	29.9919	29.9919	29.9919	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	-55.9354	(71)
Water heating gains (Table 5)	97.1229	95.1273	91.1805	82.3911	76.9678	70.6828	66.8946	70.1910	74.0126	80.2488	88.6670	95.9884	(72)
Total internal gains	326.1798	332.0056	318.3324	304.8628	288.9086	273.6901	262.5294	264.5725	273.5957	287.5122	306.4613	319.7162	(73)

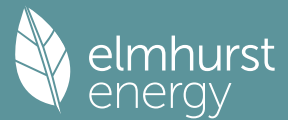
6. Solar gains

[Jan]					Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W		
Northeast					6.4000	11.2829	0.6300	0.7000	0.7700	22.0686 (75)		
Southwest					1.6000	36.7938	0.6300	0.7000	0.7700	17.9915 (79)		
Solar gains	40.0600	75.5673	122.8651	184.8715	236.8597	248.2497	233.8864	193.0976	144.0218	88.7678	49.3176	33.4193 (83)
Total gains	366.2399	407.5729	441.1976	489.7342	525.7684	521.9398	496.4158	457.6701	417.6176	376.2800	355.7789	353.1355 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)											21.0000 (85)		
Utilisation factor for gains for living area, nil,m (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	37.0523	37.2120	37.3698	38.1295	38.2751	38.9677	38.9677	39.0987	38.6979	38.2751	37.9817	37.6798	
alpha	3.4702	3.4808	3.4913	3.5420	3.5517	3.5978	3.5978	3.6066	3.5799	3.5517	3.5321	3.5120	
util living area													
	0.9825	0.9733	0.9552	0.9049	0.8045	0.6442	0.4988	0.5526	0.7756	0.9276	0.9721	0.9845 (86)	
MIT	19.0619	19.2836	19.6465	20.1697	20.6044	20.8769	20.9629	20.9466	20.7478	20.2007	19.5688	19.0493 (87)	
Th 2	19.6370	19.6420	19.6469	19.6699	19.6742	19.6944	19.6944	19.6982	19.6866	19.6742	19.6655	19.6564 (88)	
util rest of house													
	0.9775	0.9657	0.9418	0.8756	0.7439	0.5408	0.3624	0.4137	0.6860	0.8988	0.9628	0.9801 (89)	
MIT 2	17.9356	18.1571	18.5153	19.0296	19.4169	19.6388	19.6851	19.6831	19.5525	19.0737	18.4576	17.9369 (90)	
Living area fraction									fLA = Living area / (4) =				0.7428 (91)

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MIT	18.7723	18.9939	19.3556	19.8765	20.2990	20.5585	20.6343	20.6217	20.4403	19.9108	19.2831	18.7632 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.6223	18.8439	19.2056	19.7265	20.1490	20.4085	20.4843	20.4717	20.2903	19.7608	19.1331	18.6132 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9726	0.9600	0.9365	0.8770	0.7676	0.6000	0.4470	0.4991	0.7309	0.9011	0.9580	0.9755	(94)
Useful gains	356.2033	391.2706	413.1673	429.5150	403.5549	313.1585	221.9177	228.4104	305.2172	339.0614	340.8355	344.4960	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	891.4566	864.1804	784.1096	654.8333	509.0867	343.7672	229.8852	240.1678	368.9195	551.9797	730.6433	882.1795	(97)
Space heating kWh	398.2284	317.7954	275.9811	162.2292	78.5157	0.0000	0.0000	0.0000	0.0000	158.4113	280.6616	400.0366	(98a)
Space heating requirement - total per year (kWh/year)												2071.8592	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	398.2284	317.7954	275.9811	162.2292	78.5157	0.0000	0.0000	0.0000	0.0000	158.4113	280.6616	400.0366	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2071.8592	
Space heating per m2										(98c) / (4) =		52.1879	(99)

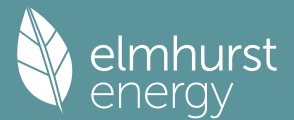
9a. Energy requirements - Individual heating systems, including micro-CHP

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													88.4000 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	398.2284	317.7954	275.9811	162.2292	78.5157	0.0000	0.0000	0.0000	0.0000	158.4113	280.6616	400.0366	(98)
Space heating efficiency (main heating system 1)	88.4000	88.4000	88.4000	88.4000	88.4000	0.0000	0.0000	0.0000	0.0000	88.4000	88.4000	88.4000	(210)
Space heating fuel (main heating system)	450.4846	359.4971	312.1958	183.5171	88.8186	0.0000	0.0000	0.0000	0.0000	179.1983	317.4905	452.5301	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	229.9655	203.6775	216.6688	190.6468	184.8145	164.7597	161.5669	169.3070	172.4947	192.2081	204.2368	227.4269	(64)
Efficiency of water heater	85.0448	84.8293	84.3997	83.5362	82.1839	79.8000	79.8000	79.8000	79.8000	83.4688	84.5616	79.8000	(216)
Fuel for water heating, kWh/month	270.4050	240.1028	256.7175	228.2206	224.8792	206.4657	202.4648	212.1641	216.1588	230.2755	241.5244	267.3196	(219)
Space cooling fuel requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	13.8152	11.0830	9.9791	7.3111	5.6473	4.6139	5.1516	6.6963	8.6978	11.4120	12.8899	14.1991	(232)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												2343.7321	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												79.8000	
Water heating fuel used												2796.6981	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
central heating pump												41.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												86.0000	(231)
Electricity for lighting (calculated in Appendix L)												111.4963	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												0.0000	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												5337.9265	(238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2343.7321	0.2100	492.1837 (261)	
Total CO2 associated with community systems			0.0000 (373)	

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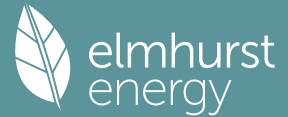


Water heating (other fuel)	2796.6981	0.2100	587.3066 (264)
Space and water heating			1079.4903 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	111.4963	0.1443	16.0924 (268)
Total CO2, kg/year			1107.5120 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			27.9000 (273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	2343.7321	1.1300	2648.4172 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2796.6981	1.1300	3160.2689 (278)
Space and water heating			5808.6861 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	111.4963	1.5338	171.0168 (282)
Total Primary energy kWh/year			6109.8037 (286)
Dwelling Primary energy Rate (DPER)			153.9000 (287)

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Plot Reference	Unit 7			Issued on Date	07/06/2026
Assessment Reference	00001	Plot Type Ref			
Plot Address	Unit 7, 73-77, Clarence Road, Wood green, London, N22 8PG			SAP Version	10.2
SAP Rating	79 C	DER	23.32	TER	
Environmental	82 B	% DER < TER			N/A
CO ₂ Emissions (t/year)	1.4	DFEE	58.10	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	128.59	TPER	
Assessor Details	Mr. Ben Whittingham			Assessor ID	EU31-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	2.9300 (1b)	x 2.6600 (2b)	= 7.7938 (1b) - (3b)
First floor	65.3300 (1c)	x 2.4100 (2c)	= 157.4453 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	68.2600		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 165.2391 (5)

2. Ventilation rate

	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1210 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	8.0000 (17)
Infiltration rate	0.5210 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.4429 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.5647	0.5536	0.5425	0.4872	0.4761	0.4207	0.4207	0.4097	0.4429	0.4761	0.4982	0.5204 (22b)
Effective ac	0.6594	0.6532	0.6472	0.6187	0.6133	0.5885	0.5885	0.5839	0.5981	0.6133	0.6241	0.6354 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
windows			7.2600	1.3258	9.6250		(27)
door			2.1000	1.4000	2.9400		(26)
HG door			3.3300	1.4000	4.6620		(26a)
Heatloss Floor 1			2.9300	0.1800	0.5274	110.0000	322.3000 (28a)
new wall	27.5400	2.0200	25.5200	0.1800	4.5936	140.0000	3572.8000 (29a)
existing wall	49.9500	10.6700	39.2800	0.2500	9.8200	190.0000	7463.2000 (29a)
External Roof 1	65.3300		65.3300	0.1100	7.1863	9.0000	587.9700 (30)
Total net area of external elements Aum(A, m ²)			145.7500				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		39.3543		(33)
Main dwelling							
Party Wall 1			26.0600	0.0000	0.0000	20.0000	521.2000 (32)
Party Floor 1			65.3300			30.0000	1959.9000 (32d)
Internal Wall 1			122.2800			9.0000	1100.5200 (32c)
Internal Floor 1			2.9300			18.0000	52.7400 (32d)
Internal Ceiling 1			2.9300			9.0000	26.3700 (32e)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	15607.0000 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							228.6405 (35)
Thermal bridges (Default value 0.200 * total exposed area)							29.1500 (36)

$$\begin{aligned} (33) + (36) + (36a) &= 68.5043 \quad (37) \end{aligned}$$
[illegible]

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	145.1817	142.2064	138.4891	132.6120	127.9204	122.8442	120.7277	124.4270	128.3522	133.7028	139.6771	144.7680 (44)
Energy conte	229.9324	202.5001	212.8526	181.5392	172.2055	151.0513	146.0096	154.0667	158.2711	181.4334	198.9957	226.6717 (45)
Energy content (annual)										Total =	Sum (45) =	2215.5293

12Total per year (kWh/year)												Total per year (kWh/year) = Sum(64)m = 2010.5252 (64)	
Electric shower(s)												2816 (64)	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)	
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)	
Heat gains from water heating, kWh/month													
89.1922	78.8381	83.5132	72.6905	69.9980	62.5533	61.2879	63.9669	64.9539	73.0663	78.4948	88.1081	(65)	

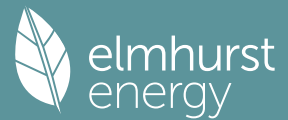
Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	110.1576	110.1576	110.1576	110.1576	110.1576	110.1576	110.1576	110.1576	110.1576	110.1576	110.1576	110.1576 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	111.0590	122.9582	111.0590	114.7610	111.0590	114.7610	111.0590	111.0590	114.7610	111.0590	114.7610	111.0590 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	193.2024	195.2072	190.1551	179.3997	165.8230	153.0628	144.5382	142.5334	147.5855	158.3409	171.9176	184.6778 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.0158	34.0158	34.0158	34.0158	34.0158	34.0158	34.0158	34.0158	34.0158	34.0158	34.0158	34.0158 (69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260	-88.1260 (71)
Water heating gains (Table 5)	119.8821	117.3186	112.2490	100.9591	94.0834	86.8796	82.3762	85.9770	90.2138	98.2075	109.0206	118.4248 (72)
Total internal gains	483.1908	494.5313	472.5104	454.1671	430.0127	410.7507	394.0208	395.6167	408.6075	426.6546	454.7465	473.2089 (73)

[Jan]	Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W
Northeast	2.0200	11.2829	0.6300	0.7000	0.7700	6.9654 (75)
Southeast	1.9600	36.7938	0.6300	0.7000	0.7700	22.0396 (77)
Southwest	3.2800	36.7938	0.6300	0.7000	0.7700	36.8825 (79)

Solar gains	65.8875	114.5444	162.8700	212.1044	246.9766	249.3262	238.6560	212.0076	179.8209	128.2529	79.3393	56.1133 (83)
Total gains	549.0782	609.0757	635.3804	666.2715	676.9893	660.0769	632.6767	607.6242	588.4284	554.9075	534.0858	529.3222 (84)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	41.5009	41.6355	41.7682	42.4031	42.5241	43.0963	43.0963	43.2040	42.8741	42.5241	42.2801	42.0281
alpha	3.7667	3.7757	3.7845	3.8269	3.8349	3.8731	3.8731	3.8803	3.8583	3.8349	3.8187	3.8019
util living area	0.9912	0.9860	0.9775	0.9545	0.9022	0.7848	0.6357	0.6746	0.8558	0.9584	0.9851	0.9923 (86)

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MIT	19.1183	19.3118	19.6118	20.0520	20.4676	20.8007	20.9360	20.9181	20.6929	20.1660	19.5832	19.1001 (87)
Th 2	19.6648	19.6685	19.6721	19.6892	19.6924	19.7073	19.7073	19.7101	19.7015	19.6924	19.6859	19.6791 (88)
util rest of house	0.9884	0.9815	0.9698	0.9370	0.8596	0.6856	0.4772	0.5215	0.7788	0.9388	0.9795	0.9899 (89)
MIT 2	17.9994	18.1936	18.4927	18.9341	19.3248	19.6104	19.6904	19.6859	19.5304	19.0515	18.4767	17.9915 (90)
Living area fraction									fLA = Living area / (4) =			0.1992 (91)
MIT	18.2223	18.4164	18.7156	19.1568	19.5525	19.8475	19.9386	19.9314	19.7620	19.2736	18.6971	18.2124 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.0723	18.2664	18.5656	19.0068	19.4025	19.6975	19.7886	19.7814	19.6120	19.1236	18.5471	18.0624 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9834	0.9747	0.9607	0.9247	0.8475	0.6848	0.4883	0.5311	0.7721	0.9269	0.9724	0.9855 (94)
Useful gains	539.9675	593.6557	610.4032	616.1011	573.7666	451.9905	308.9359	322.7150	454.3193	514.3580	519.3623	521.6351 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	1438.6834	1391.7691	1252.3378	1033.3127	785.2576	512.7852	320.7553	339.3017	557.3579	868.9682	1173.7557	1429.9337 (97)
Space heating kWh	668.6446	536.3322	477.5994	300.3923	157.3492	0.0000	0.0000	0.0000	0.0000	263.8300	471.1633	675.7742 (98a)
Space heating requirement - total per year (kWh/year)												3551.0853
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (98b)
Solar heating contribution - total per year (kWh/year)												0.0000
Space heating kWh	668.6446	536.3322	477.5994	300.3923	157.3492	0.0000	0.0000	0.0000	0.0000	263.8300	471.1633	675.7742 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3551.0853
Space heating per m2										(98c) / (4) =		52.0229 (99)

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

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000 (201)
Fraction of space heat from main system(s)												1.0000 (202)
Efficiency of main space heating system 1 (in %)												88.4000 (206)
Efficiency of main space heating system 2 (in %)												0.0000 (207)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	668.6446	536.3322	477.5994	300.3923	157.3492	0.0000	0.0000	0.0000	0.0000	263.8300	471.1633	675.7742 (98)
Space heating efficiency (main heating system 1)	88.4000	88.4000	88.4000	88.4000	88.4000	0.0000	0.0000	0.0000	0.0000	88.4000	88.4000	88.4000 (210)
Space heating fuel (main heating system)	756.3853	606.7107	540.2708	339.8103	177.9969	0.0000	0.0000	0.0000	0.0000	298.4502	532.9901	764.4504 (211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (215)
Water heating												
Water heating requirement	280.8913	248.5274	263.8115	230.8543	223.1644	200.3664	196.9685	205.0256	207.5861	232.3923	248.3108	277.6306 (64)
Efficiency of water heater (217)m	85.6689	85.4829	85.1353	84.4453	83.1448	79.8000	79.8000	79.8000	79.8000	84.1527	85.2299	79.8000 (216)
Fuel for water heating, kWh/month	327.8803	290.7337	309.8732	273.3772	268.4044	251.0857	246.8277	256.9243	260.1330	276.1554	291.3422	323.9178 (219)
Space cooling fuel requirement												
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041 (231)
Lighting	23.6104	18.9412	17.0544	12.4948	9.6513	7.8852	8.8043	11.4441	14.8648	19.5034	22.0291	24.2666 (232)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)												
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)												
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)												
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235c)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)												
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)												
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)												
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235d)
Annual totals kWh/year												
Space heating fuel - main system 1												4017.0648 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												79.8000
Water heating fuel used												3376.6549 (219)
Space cooling fuel												0.0000 (221)
Electricity for pumps and fans:												
central heating pump												41.0000 (230c)
main heating flue fan												45.0000 (230e)
Total electricity for the above, kWh/year												86.0000 (231)
Electricity for lighting (calculated in Appendix L)												190.5496 (232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV generation												0.0000 (233)
Wind generation												0.0000 (234)
Hydro-electric generation (Appendix N)												0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)												0.0000 (235)
Appendix Q - special features												
Energy saved or generated												-0.0000 (236)
Energy used												0.0000 (237)
Total delivered energy for all uses												7670.2693 (238)

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12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	4017.0648	0.2100	843.5836 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	3376.6549	0.2100	709.0975 (264)
Space and water heating			1552.6811 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	190.5496	0.1443	27.5022 (268)
Total CO2, kg/year			1592.1126 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			23.3200 (273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	4017.0648	1.1300	4539.2832 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	3376.6549	1.1300	3815.6200 (278)
Space and water heating			8354.9032 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	190.5496	1.5338	292.2714 (282)
Total Primary energy kWh/year			8777.2754 (286)
Dwelling Primary energy Rate (DPER)			128.5900 (287)

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Plot Reference	Unit 1			Issued on Date	07/06/2026
Assessment Reference	00001	Plot Type Ref			
Plot Address	Unit 1, 73-77, Clarence road, Wood green, London, N22 8PG			SAP Version	10.2
SAP Rating	79 C	DER	23.79	TER	
Environmental	80 C	% DER < TER			N/A
CO ₂ Emissions (t/year)	1.74	DFEE	66.32	TFEE	
Compliance Check	N/A	% DFEE < TFEE			
% DPER < TPER		DPER	130.57	TPER	
Assessor Details	Mr. Ben Whittingham			Assessor ID	EU31-0001
Client					

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling	84.1900 (1b)	2.6100 (2b)	219.7359 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	84.1900		219.7359 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 219.7359 (5)

2. Ventilation rate

	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)

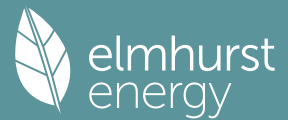
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) =	0.0910 (8)
Pressure test	Yes	
Pressure Test Method	Blower Door	
Measured/design AP50	8.0000	(17)
Infiltration rate	0.4910	(18)
Number of sides sheltered	2	(19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.4174 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.5321	0.5217	0.5113	0.4591	0.4487	0.3965	0.3965	0.3861	0.4174	0.4487	0.4695	0.4904 (22b)
Effective ac	0.6416	0.6361	0.6307	0.6054	0.6007	0.5786	0.5786	0.5745	0.5871	0.6007	0.6102	0.6202 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
windows			16.3800	1.3258	21.7159		(27)
door			2.1000	1.4000	2.9400		(26)
new floor			47.0900	0.1200	5.6508	110.0000	5179.9000 (28a)
existing floor			37.1000	0.1800	6.6780	110.0000	4081.0000 (28a)
External Wall 1	33.6700	8.4300	25.2400	0.2500	6.3100	190.0000	4795.6000 (29a)
new wall	45.4100	10.0500	35.3600	0.1800	6.3648	140.0000	4950.4000 (29a)
flat roof	21.5000		21.5000	0.1400	3.0100	9.0000	193.5000 (30)
bay roof	1.3500		1.3500	0.1500	0.2025	9.0000	12.1500 (30)
Total net area of external elements A _{um} (A, m ²)			186.1200				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	52.8720		(33)
Main dwelling							
Party Wall 1			50.8200	0.0000	0.0000	20.0000	1016.4000 (32)
Party Ceiling 1			61.3400			20.0000	1226.8000 (32b)
Internal Wall 1			150.2300			9.0000	1352.0700 (32c)
Heat capacity C _m = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		22807.8200 (34)
Thermal mass parameter (TMP = C _m / TFA) in kJ/m ² K							270.9089 (35)
Thermal bridges (Default value 0.200 * total exposed area)							37.2240 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss					(33) + (36) + (36a) =		90.0960 (37)

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Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	46.5233	46.1246	45.7339	43.8984	43.5550	41.9563	41.9563	41.6603	42.5721	43.5550	44.2497	44.9760	(38)
Heat transfer coeff	136.6193	136.2206	135.8299	133.9944	133.6510	132.0523	132.0523	131.7563	132.6681	133.6510	134.3457	135.0720	(39)
Average = Sum(39)m / 12 =												133.9927	
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	1.6227	1.6180	1.6134	1.5916	1.5875	1.5685	1.5685	1.5650	1.5758	1.5875	1.5957	1.6044	(40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.5376	(42)
Hot water usage for mixer showers	91.8039	90.4243	88.4139	84.5673	81.7287	78.5631	76.7637	78.7589	80.9460	84.3449	88.2741	91.4522	91.4522	(42a)
Hot water usage for baths	30.3526	29.9018	29.2671	28.0966	27.2202	26.2484	25.7235	26.3538	27.0402	28.0800	29.2746	30.2500	30.2500	(42b)
Hot water usage for other uses	42.7550	41.2003	39.6456	38.0908	36.5361	34.9814	34.9814	36.5361	38.0908	39.6456	41.2003	42.7550	42.7550	(42c)
Average daily hot water use (litres/day)												151.6500	151.6500	(43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
	164.9116	161.5264	157.3265	150.7548	145.4850	139.7929	137.4686	141.6488	146.0770	152.0705	158.7489	164.4572	164.4572	(44)
Energy content (annual)	261.1796	230.0115	241.8050	206.3758	195.8508	171.8916	166.2563	175.3909	180.1276	206.3583	226.1670	257.5002	257.5002	(45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum (45)m =		2518.9145	2518.9145	
	39.1769	34.5017	36.2707	30.9564	29.3776	25.7837	24.9385	26.3086	27.0191	30.9537	33.9250	38.6250	38.6250	(46)
Water storage loss (or HIU loss):														
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage														
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)
Combi loss	50.9589	46.0274	50.9589	49.3151	50.9589	49.3151	50.9589	50.9589	49.3151	50.9589	49.3151	50.9589	50.9589	(61)
Total heat required for water heating calculated for each month														
	312.1385	276.0389	292.7639	255.6909	246.8097	221.2067	217.2152	226.3498	229.4426	257.3172	275.4821	308.4592	308.4592	(62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63d)
Output from w/h	312.1385	276.0389	292.7639	255.6909	246.8097	221.2067	217.2152	226.3498	229.4426	257.3172	275.4821	308.4592	308.4592	(64)
12Total per year (kWh/year)														
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)
										Total per year (kWh/year) = Sum(64a)m =		3118.9145	3118.9145	(64)
												3119	3119	(64)
Heat gains from water heating, kWh/month														
	99.5819	87.9857	93.1399	80.9487	77.8601	69.4827	68.0200	71.0572	72.2212	81.3538	87.5293	98.3586	98.3586	(65)

5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts													
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	126.8786	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
116.1579	128.6034	116.1579	120.0298	116.1579	120.0298	116.1579	116.1579	120.0298	116.1579	120.0298	116.1579	116.1579	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
227.9744	230.3401	224.3787	211.6876	195.6674	180.6106	170.5518	168.1861	174.1475	186.8386	202.8588	217.9156	217.9156	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	35.6879	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)													
-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	-101.5029	(71)
Water heating gains (Table 5)													
133.8467	130.9310	125.1880	112.4288	104.6507	96.5038	91.4247	95.5070	100.3072	109.3466	121.5685	132.2024	132.2024	(72)
Total internal gains	542.0426	553.9381	529.7882	508.2098	480.5395	458.2078	439.1979	440.9146	455.5481	476.4066	508.5207	530.3394	(73)

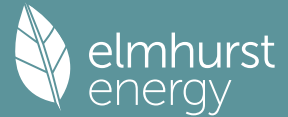
6. Solar gains

[Jan]					Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d				Gains W
Northeast					2.0200	11.2829	0.6300	0.7000	0.7700				6.9654 (75)
Southwest					3.7100	36.7938	0.6300	0.7000	0.7700				41.7177 (79)
Northwest					10.6500	11.2829	0.6300	0.7000	0.7700				36.7235 (81)
Solar gains	85.4066	159.9907	257.4519	383.6037	488.6396	511.0456	481.9076	399.5804	300.5126	187.2167	104.9401		71.3802 (83)
Total gains	627.4492	713.9288	787.2401	891.8135	969.1791	969.2534	921.1055	840.4950	756.0607	663.6233	613.4608		601.7196 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)													21.0000	(85)
Utilisation factor for gains for living area, nil,m (see Table 9a)														
tau	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
46.3734	46.5091	46.6430	47.2819	47.4034	47.9772	47.9772	47.9772	48.0850	47.7546	47.4034	47.1582	46.9047		
alpha	4.0916	4.1006	4.1095	4.1521	4.1602	4.1985	4.1985	4.2057	4.1836	4.1602	4.1439	4.1270		
util living area	0.9963	0.9932	0.9860	0.9606	0.8918	0.7487	0.5938	0.6589	0.8757	0.9753	0.9933	0.9969	(86)	
MIT	19.1696	19.3588	19.6794	20.1508	20.5792	20.8668	20.9620	20.9417	20.7179	20.1747	19.6038	19.1499	(87)	

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Th 2	19.5967	19.6001	19.6035	19.6195	19.6225	19.6365	19.6365	19.6391	19.6311	19.6225	19.6165	19.6101 (88)
util rest of house	0.9949	0.9906	0.9802	0.9427	0.8401	0.6346	0.4277	0.4929	0.7948	0.9607	0.9902	0.9958 (89)
MIT 2	17.9771	18.1677	18.4877	18.9580	19.3507	19.5808	19.6287	19.6252	19.4832	18.9910	18.4245	17.9673 (90)
Living area fraction									fLA = Living area / (4) =			0.3040 (91)
MIT	18.3396	18.5298	18.8499	19.3206	19.7241	19.9717	20.0340	20.0253	19.8585	19.3508	18.7829	18.3268 (92)
Temperature adjustment												-0.1500
adjusted MIT	18.1896	18.3798	18.6999	19.1706	19.5741	19.8217	19.8840	19.8753	19.7085	19.2008	18.6329	18.1768 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9927	0.9872	0.9748	0.9349	0.8379	0.6522	0.4600	0.5247	0.8006	0.9543	0.9869	0.9939	(94)
Useful gains	622.8963	704.7876	767.3965	833.7862	812.0742	632.1171	423.7505	440.9747	605.2868	633.3092	605.4221	598.0503	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	1897.5861	1836.2220	1657.1168	1376.1991	1052.3823	689.5353	433.6568	457.8967	744.0696	1149.5003	1549.3991	1887.8698	(97)
Space heating kWh	948.3691	760.3239	661.9519	390.5373	178.7893	0.0000	0.0000	0.0000	0.0000	384.0462	679.6634	959.6257	(98a)
Space heating requirement - total per year (kWh/year)												4963.3069	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	948.3691	760.3239	661.9519	390.5373	178.7893	0.0000	0.0000	0.0000	0.0000	384.0462	679.6634	959.6257	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												4963.3069	
Space heating per m2										(98c) / (4) =		58.9536	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)												0.0000 (201)
Fraction of space heat from main system(s)												1.0000 (202)
Efficiency of main space heating system 1 (in %)												88.4000 (206)
Efficiency of main space heating system 2 (in %)												0.0000 (207)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
Space heating requirement	948.3691	760.3239	661.9519	390.5373	178.7893	0.0000	0.0000	0.0000	0.0000	384.0462	679.6634	959.6257 (98)
Space heating efficiency (main heating system 1)	88.4000	88.4000	88.4000	88.4000	88.4000	0.0000	0.0000	0.0000	0.0000	88.4000	88.4000	88.4000 (210)
Space heating fuel (main heating system)	1072.8158	860.0949	748.8144	441.7843	202.2503	0.0000	0.0000	0.0000	0.0000	434.4414	768.8500	1085.5495 (211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (215)
Water heating												
Water heating requirement	312.1385	276.0389	292.7639	255.6909	246.8097	221.2067	217.2152	226.3498	229.4426	257.3172	275.4821	308.4592 (64)
Efficiency of water heater	86.1022	85.9333	85.5721	84.7847	83.2003	79.8000	79.8000	79.8000	79.8000	84.7362	85.7351	86.1418 (217)
Fuel for water heating, kWh/month	362.5209	321.2245	342.1256	301.5766	296.6454	277.2014	272.1996	283.6463	287.5221	303.6684	321.3176	358.0829 (219)
Space cooling fuel requirement												
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041 (231)
Lighting	24.6944	19.8108	17.8374	13.0684	10.0944	8.2472	9.2085	11.9695	15.5472	20.3988	23.0404	25.3807 (232)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)												
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)												
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)												
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235c)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)												
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)												
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)												
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (235d)
Annual totals kWh/year												
Space heating fuel - main system 1												5614.6006 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												79.8000
Water heating fuel used												3727.7313 (219)
Space cooling fuel												0.0000 (221)
Electricity for pumps and fans:												
central heating pump												41.0000 (230c)
main heating flue fan												45.0000 (230e)
Total electricity for the above, kWh/year												86.0000 (231)
Electricity for lighting (calculated in Appendix L)												199.2979 (232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV generation												0.0000 (233)
Wind generation												0.0000 (234)
Hydro-electric generation (Appendix N)												0.0000 (235a)
Electricity generated - Micro CHP (Appendix N)												0.0000 (235)
Appendix Q - special features												
Energy saved or generated												-0.0000 (236)
Energy used												0.0000 (237)
Total delivered energy for all uses												9627.6298 (238)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

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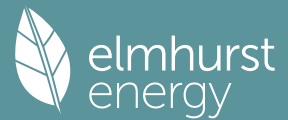


	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	5614.6006	0.2100	1179.0661 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	3727.7313	0.2100	782.8236 (264)
Space and water heating			1961.8897 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	199.2979	0.1443	28.7649 (268)
Total CO2, kg/year			2002.5838 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			23.7900 (273)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	5614.6006	1.1300	6344.4986 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	3727.7313	1.1300	4212.3364 (278)
Space and water heating			10556.8350 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	199.2979	1.5338	305.6898 (282)
Total Primary energy kWh/year			10992.6257 (286)
Dwelling Primary energy Rate (DPER)			130.5700 (287)

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Plot Reference	Unit 2			Issued on Date	07/06/2026	
Assessment Reference	00001		Plot Type Ref			
Plot Address	Unit 2, 73-77, Clarence road , Wood green, London, N22 8PG			SAP Version	10.2	
SAP Rating	72 C	DER	6.41	TER		
Environmental	94 A	% DER < TER				N/A
CO ₂ Emissions (t/year)	0.53	DFEE	57.87	TFEE		
Compliance Check	N/A	% DFEE < TFEE				
% DPER < TPER		DPER	66.99	TPER		
Assessor Details	Mr. Ben Whittingham			Assessor ID	EU31-0001	
Client						

SAP 10 WORKSHEET FOR Conversion (As Designed) (Version 10.2, February 2022)
CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	93.3400 (1b)	2.6100 (2b)	243.6174 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	93.3400		243.6174 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	243.6174 (5)

2. Ventilation rate

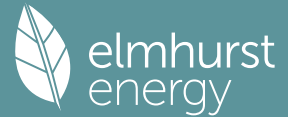
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	3 * 10 = 30.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c)	30.0000 / (5) = 0.1231 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	10.0000 (17)
Infiltration rate	0.6231 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.5297 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infiltr rate	0.6753	0.6621	0.6488	0.5826	0.5694	0.5032	0.5032	0.4899	0.5297	0.5694	0.5959	0.6224 (22b)
Effective ac	0.7280	0.7192	0.7105	0.6697	0.6621	0.6266	0.6266	0.6200	0.6403	0.6621	0.6775	0.6937 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Main dwelling							
windows			9.5700	1.3258	12.6875		(27)
door			2.1000	1.4000	2.9400		(26a)
new floor			47.3500	0.1200	5.6820	110.0000	5208.5000 (28a)
existing floor			45.9900	0.1800	8.2782	110.0000	5058.9000 (28a)
new wall	21.2500	7.9600	13.2900	0.1800	2.3922	140.0000	1860.6000 (29a)
existing wall	21.0600	3.7100	17.3500	0.2500	4.3375	190.0000	3296.5000 (29a)
External Roof 1	38.9900		38.9900	0.1400	5.4586	9.0000	350.9100 (30)
Total net area of external elements A _{um} (A, m ²)			174.6400				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 41.7760		(33)
Main dwelling							
Party Wall 1			90.1400	0.0000	0.0000	20.0000	1802.8000 (32)
Party Ceiling 1			54.3500			20.0000	1087.0000 (32b)
Internal Wall 1			186.5100			9.0000	1678.5900 (32c)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 20343.8000 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							217.9537 (35)
Thermal bridges (Default value 0.200 * total exposed area)							34.9280 (36)
Point Thermal bridges							(36a) = 0.0000
Total fabric heat loss							(33) + (36) + (36a) = 76.7040 (37)

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Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	58.5296	57.8177	57.1199	53.8425	53.2293	50.3747	50.3747	49.8460	51.4742	53.2293	54.4698	55.7667 (38)
Average = Sum(39)m / 12 =	135.2336	134.5217	133.8239	130.5465	129.9333	127.0787	127.0787	126.5500	128.1782	129.9333	131.1738	132.4707 (39)
												130.5435
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.4488	1.4412	1.4337	1.3986	1.3920	1.3615	1.3615	1.3558	1.3732	1.3920	1.4053	1.4192 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

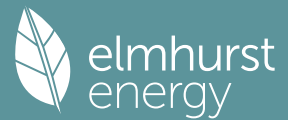
4. Water heating energy requirements (kWh/year)												
Assumed occupancy												2.6687 (42)
Hot water usage for mixer showers												
Hot water usage for baths	121.8240	119.9932	117.3254	112.2211	108.4542	104.2534	101.8656	104.5132	107.4155	111.9259	117.1399	121.3572 (42a)
Hot water usage for other uses	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)
Average daily hot water use (litres/day)	41.9605	40.4347	38.9088	37.3830	35.8572	34.3313	34.3313	35.8572	37.3830	38.9088	40.4347	41.9605 (42c)
												150.4635 (43)
Daily hot water use												
Energy conte	163.7845	160.4279	156.2342	149.6040	144.3113	138.5847	136.1970	140.3704	144.7985	150.8347	157.5746	163.3177 (44)
Energy content (annual)	259.3946	228.4472	240.1262	204.8005	194.2708	170.4060	164.7184	173.8079	178.5510	204.6813	224.4938	255.7161 (45)
Distribution loss (46)m = 0.15 x (45)m	38.9092	34.2671	36.0189	30.7201	29.1406	25.5609	24.7078	26.0712	26.7827	30.7022	33.6741	38.3574 (46)
Water storage loss (or HIU loss):												150.0000 (47)
Store volume												1.8000 (48)
a) If manufacturer declared loss factor is known (kWh/day):												0.5400 (49)
Temperature factor from Table 2b												0.9720 (55)
Enter (49) or (54) in (55)												
Total storage loss												
If cylinder contains dedicated solar storage	30.1320	27.2160	30.1320	29.1600	30.1320	29.1600	30.1320	30.1320	29.1600	30.1320	29.1600	30.1320 (56)
Primary loss	30.1320	27.2160	30.1320	29.1600	30.1320	29.1600	30.1320	30.1320	29.1600	30.1320	29.1600	30.1320 (57)
Combi loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624 (59)
Total heat required for water heating calculated for each month	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
WWHRS	312.7890	276.6744	293.5206	256.4725	247.6652	222.0780	218.1128	227.2023	230.2230	258.0757	276.1658	309.1105 (62)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
Output from w/h	312.7890	276.6744	293.5206	256.4725	247.6652	222.0780	218.1128	227.2023	230.2230	258.0757	276.1658	309.1105 (64)
Total per year (kWh/year) = Sum(64)m =												3128.0898 (64)
12Total per year (kWh/year)												3128 (64)
Electric shower(s)												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)
Heat gains from water heating, kWh/month												
	128.9642	114.5404	122.5575	109.4338	107.3106	97.9976	97.4844	100.5066	100.7058	110.7721	115.9818	127.7411 (65)

5. Internal gains (see Table 5 and 5a)												
Metabolic gains (Table 5), Watts												
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	133.4367	133.4367	133.4367	133.4367	133.4367	133.4367	133.4367	133.4367	133.4367	133.4367	133.4367	133.4367 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	141.9953	157.2091	141.9953	146.7285	141.9953	146.7285	141.9953	141.9953	146.7285	141.9953	146.7285	141.9953 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	245.0901	247.6333	241.2244	227.5805	210.3575	194.1703	183.3563	180.8130	187.2220	200.8659	218.0889	234.2760 (68)
Pumps, fans	36.3437	36.3437	36.3437	36.3437	36.3437	36.3437	36.3437	36.3437	36.3437	36.3437	36.3437	36.3437 (69)
Losses e.g. evaporation (negative values) (Table 5)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Water heating gains (Table 5)	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493	-106.7493 (71)
Total internal gains	173.3390	170.4471	164.7278	151.9913	144.2346	136.1078	131.0274	135.0896	139.8692	148.8872	161.0858	171.6951 (72)
	623.4554	638.3205	610.9785	589.3313	559.6184	540.0376	519.4100	520.9289	536.8507	554.7794	588.9342	610.9974 (73)

6. Solar gains												
[Jan]												
	Area	Solar flux	g	FF	Access	Gains						
	m2	Table 6a	Specific data	Specific data	factor	W						
		W/m2	or Table 6b	or Table 6c	Table 6d							
Northeast	5.8600	11.2829	0.6300	0.7000	0.7700	20.2065 (75)						
Southwest	3.7100	36.7938	0.6300	0.7000	0.7700	41.7177 (79)						
Solar gains	61.9243	112.1917	171.3334	242.1723	298.5281	308.3666	292.3056	248.4275	195.5758	128.8026	75.3933	52.2034 (83)
Total gains	685.3797	750.5123	782.3119	831.5036	858.1465	848.4042	811.7156	769.3564	732.4265	683.5820	664.3275	663.2008 (84)

7. Mean internal temperature (heating season)												
Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
alpha	41.7874	42.0085	42.2275	43.2877	43.4920	44.4690	44.4690	44.6547	44.0875	43.4920	43.0807	42.6589
util living area	3.7858	3.8006	3.8152	3.8858	3.8995	3.9646	3.9646	3.9770	3.9392	3.8995	3.8720	3.8439
	0.9923	0.9883	0.9811	0.9591	0.9062	0.7814	0.6308	0.6757	0.8651	0.9641	0.9872	0.9933 (86)

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Living	19.0982	19.2815	19.5826	20.0484	20.4752	20.8157	20.9423	20.9236	20.6933	20.1567	19.5814	19.1014
Non living	17.5497	17.7867	18.1731	18.7755	19.2936	19.6735	19.7719	19.7661	19.5549	18.9197	18.1878	17.5680
24 / 16	0	0	0	0	0	0	0	0	0	0	0	0
24 / 9	3	0	0	0	0	0	0	0	0	0	0	0
16 / 9	28	0	0	0	0	0	0	0	0	0	0	10
MIT	20.0271	19.2815	19.5826	20.0484	20.4752	20.8157	20.9423	20.9236	20.6933	20.1567	19.5814	19.3669 (87)
Th 2	19.7261	19.7319	19.7376	19.7644	19.7694	19.7930	19.7930	19.7974	19.7839	19.7694	19.7592	19.7486 (88)
util rest of house	0.9900	0.9847	0.9748	0.9439	0.8671	0.6883	0.4834	0.5330	0.7954	0.9477	0.9825	0.9913 (89)
MIT 2	18.8584	17.7867	18.1731	18.7755	19.2936	19.6735	19.7719	19.7661	19.5549	18.9197	18.1878	17.9609 (90)
Living area fraction									FLA = Living area / (4) =			
MIT	19.2000	18.2236	18.5850	19.1475	19.6389	20.0074	20.1140	20.1044	19.8876	19.2812	18.5951	18.3719 (92)
Temperature adjustment												0.0000
adjusted MIT	19.2000	18.2236	18.5850	19.1475	19.6389	20.0074	20.1140	20.1044	19.8876	19.2812	18.5951	18.3719 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9888	0.9784	0.9667	0.9339	0.8620	0.7071	0.5257	0.5731	0.8026	0.9389	0.9762	0.9881	(94)
Useful gains	677.7091	734.3089	756.2318	776.5334	739.6819	599.8888	426.7373	440.8879	587.8462	641.7875	648.4844	655.2919	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	2014.9806	1792.3115	1617.2659	1337.7777	1031.5314	687.1592	446.5506	468.7958	741.8473	1127.9828	1507.8582	1877.3561	(97)
Space heating kWh	994.9300	710.9778	640.6094	404.0959	217.1360	0.0000	0.0000	0.0000	0.0000	361.7293	618.7491	909.2158	(98a)
Space heating requirement - total per year (kWh/year)												4857.4432	
Solar heating kWh	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(98b)
Solar heating contribution - total per year (kWh/year)												0.0000	
Space heating kWh	994.9300	710.9778	640.6094	404.0959	217.1360	0.0000	0.0000	0.0000	0.0000	361.7293	618.7491	909.2158	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												4857.4432	
Space heating per m2												52.0403	(99)

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													240.5349 (206)
Efficiency of main space heating system 2 (in %)													0.0000 (207)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	994.9300	710.9778	640.6094	404.0959	217.1360	0.0000	0.0000	0.0000	0.0000	361.7293	618.7491	909.2158	(98)
Space heating efficiency (main heating system 1)	240.5349	240.5349	240.5349	240.5349	240.5349	0.0000	0.0000	0.0000	0.0000	240.5349	240.5349	240.5349	(210)
Space heating fuel (main heating system)	413.6323	295.5820	266.3270	167.9989	90.2721	0.0000	0.0000	0.0000	0.0000	150.3854	257.2388	377.9974	(211)
Space heating efficiency (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(212)
Space heating fuel (main heating system 2)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(213)
Space heating fuel (secondary)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating													
Water heating requirement	312.7890	276.6744	293.5206	256.4725	247.6652	222.0780	218.1128	227.2023	230.2230	258.0757	276.1658	309.1105	(64)
Efficiency of water heater (217)m	176.0219	176.0219	176.0219	176.0219	176.0219	176.0219	176.0219	176.0219	176.0219	176.0219	176.0219	176.0219	(216)
Fuel for water heating, kWh/month	177.6989	157.1818	166.7523	145.7048	140.7013	126.1650	123.9123	129.0761	130.7923	146.6157	156.8929	175.6091	(219)
Space cooling fuel requirement													
(221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)
Pumps and Fa	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(231)
Lighting	30.1873	24.2174	21.8050	15.9753	12.3398	10.0817	11.2568	14.6320	19.0055	24.9362	28.1654	31.0263	(232)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												2019.4338	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												176.0219	
Water heating fuel used												1777.1025	(219)
Space cooling fuel												0.0000	(221)
Electricity for pumps and fans:													
Total electricity for the above, kWh/year												0.0000	(231)
Electricity for lighting (calculated in Appendix L)												243.6286	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												0.0000	(233)
Wind generation												0.0000	(234)
Hydro-electric generation (Appendix N)												0.0000	(235a)
Electricity generated - Micro CHP (Appendix N)												0.0000	(235)
Appendix Q - special features													
Energy saved or generated												-0.0000	(236)
Energy used												0.0000	(237)
Total delivered energy for all uses												4040.1649	(238)

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----- 12a. Carbon dioxide emissions - Individual heating systems including micro-CHP -----

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	2019.4338	0.1547	312.3120	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	1777.1025	0.1410	250.5976	(264)
Space and water heating			562.9096	(265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000	(267)
Energy for lighting	243.6286	0.1443	35.1631	(268)
Total CO2, kg/year			598.0727	(272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			6.4100	(273)

----- 13a. Primary energy - Individual heating systems including micro-CHP -----

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year	
Space heating - main system 1	2019.4338	1.5725	3175.6401	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	1777.1025	1.5214	2703.7318	(278)
Space and water heating			5879.3720	(279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000	(281)
Energy for lighting	243.6286	1.5338	373.6857	(282)
Total Primary energy kWh/year			6253.0577	(286)
Dwelling Primary energy Rate (DPER)			66.9900	(287)