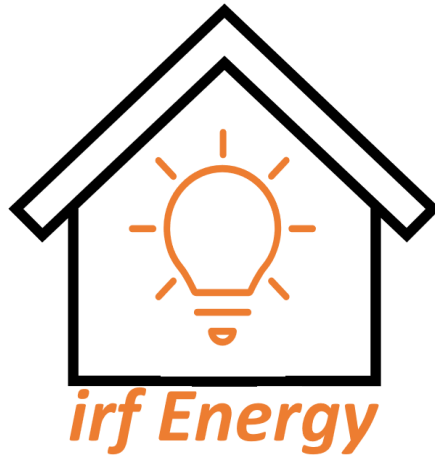




TECHNICAL ENERGY STATEMENT

**34 KINGSWAY PLACE
LONDON N6**

<i>Document reference</i>	<i>34 KINGSWAY PLACE- TECHNICAL ENERGY STATEMENTH</i>
<i>Prepared for</i>	<i>D HAYHURST</i>
<i>Date</i>	<i>29 March 2026</i>
<i>Issue number</i>	<i>First issue</i>
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Link to appendices:

https://drive.google.com/drive/folders/1oJn2Pg8wDWGbaSGUf8GBG4jykpQrZUfb?usp=drive_link



1 SUMMARY

This report is prepared by IRF Energy Ltd. It provides supporting evidence for the Energy and Sustainability Statement by D Hayhurst, for the proposed residential dwelling at 34 Kingsley Place, London. The proposed strategy to meet regulated and planning energy and carbon targets is set out, with details of the methodology, specifications, calculations and results. Energy and carbon data were calculated using Elmhurst Energy's SAP10.2 software, and results included in the Part L-2021_GLA carbon emissions reporting spreadsheet v2.0.

The proposed property is a small three story dwelling, with a footprint of approximately 50m². This replaces an existing small dwelling on this site. Bedrooms are located in a basement, with kitchen, bathroom and living room on the ground floor. A workspace is included on the top floor.

The table below is taken from the GLA carbon emissions reporting spreadsheet. Targets are shown from from Haringey's Energy Statement, showing that these requirements are met.

The property achieves zero regulated carbon targets, without need for off-set payments.

REGULATED CO₂ SAVINGS FROM EACH STAGE OF THE ENERGY HEIRACY:

	Regulated residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.6	44%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.7	56%
Cumulative on site savings	1.3	100%
Annual savings from off-set payment	0.0	-
(Tonnes CO₂)		
Cumulative savings for off-set payment	0	-
Cash in-lieu contribution (£)	-12	

HARINGEY CARBON TARGETS

BE LEAN: Min 10%

BE GREEN: Min 20%

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development



2 POLICY FRAMEWORK

Part L of the building regulations deals with energy usage and carbon emissions. The 2021 revision of these regulations included major upgrades in fabric and energy standards, and were introduced as a stepping stone to the Future Homes standard. These will bring in standards that create zero carbon ready dwellings. All new developments must meet the carbon and fabric targets included in these regulations.

London Borough of Haringey Explanatory Note: Energy Statement and Sustainability Assessment Information Requirements for Minor Developments. This sets out policy requirements and targets. Under Haringey Local Plan Policy SP4, all developments are required to be zero carbon, meaning a 100% reduction in regulated carbon emissions compared to the Part L 2021 Building Regulations baseline.

The London Plan 2021 Policy SI 2 sets a net zero carbon target for all major developments, with further guidance provided in the Mayor of London's Energy Assessment Guidance (June 2022). This stipulates a hierarchical approach of be lean, be clean, be green as set out below:

i) Be lean (Demand reduction)

- Residential developments should achieve at least a 10 per cent improvement on Building Regulations from energy efficiency measures alone.

ii) Be clean (Heating infrastructure- e.g. District heating Networks)



iii) Be Green (Renewable energy) e.g. Photovoltaic panels, heat pumps

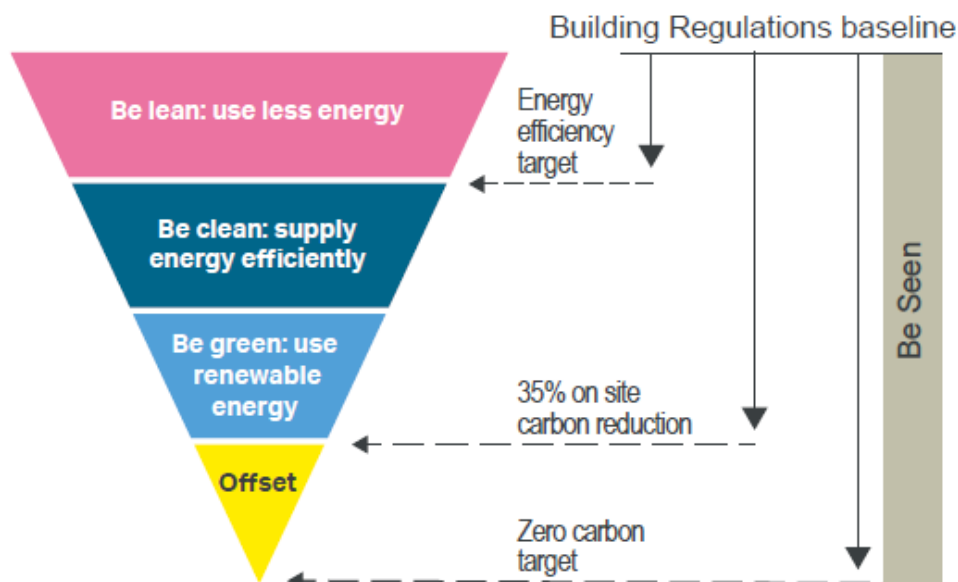
An onsite reduction of 35% beyond regulated targets is generally required. This is increased to a 50% reduction for residential developments, in the Mayor of London's Energy Assessment Guidance. Although, for this scheme, these targets are met, they are assumed to be superseded by Haringey's Energy Statement.

iv) Be seen: Monitor, verify and report on energy performance

This fourth element is intended to assess actual energy performance during its usage.

Once on-site reductions have been maximised, the residual emissions can be offset via a payment into the relevant borough's carbon offset fund.; or alternatively offset against measures installed off-site.

These steps are illustrated in the figure below taken from the London Plan.



Source: Greater London Authority



3 METHODOLOGY

The methodology set out in the Mayor of London's Energy Assessment Guidance (June 2022) has been followed.

Regulated carbon emissions and energy use:

Energy use and carbon emissions have been assessed using Elmhurst Energy's SAP 10.2 software, which is an approved software for the current 2021 Part L of the Building Regulations. The specification detailed in the following section was included in the "*Be Green*" SAP assessments. For the "*Be Lean*" category the assessments were re-run with the same fabric specification, but with PV power removed, and the heat pump replaced with a notional gas boiler and heating specification. The results were then entered into the GLC carbon emissions reporting spreadsheet in the appendix.

Unregulated carbon emissions and energy use: Residential flats

Unregulated carbon emissions energy use are those associated with elements not covered in regulated targets included in the SAP methodology. These include emissions and energy use associated with cooking and electrical appliances such as dishwashers, TVs and washing machines. They are not calculated in the current version of SAP. However, a methodology for calculating them is included the SAP10.2 Document Appendices L2 Electrical appliances and L3 Cooking. A calculation following this methodology is in the appendix. The results from this calculation are included in the GLC carbon emissions reporting spreadsheet. The methodology followed is likely to be conservative and potentially more accurate estimates could be gained using manufacturer's data.



4 PROPOSED SPECIFICATION

The table below summarises the proposed specification. The results in the next section show that this passes all Part L regulated targets. This follows the principles of “*be lean, be clean and be green*” set out in the London Plan:

Be Lean: Fabric standards on individual elements are significantly better than regulated limits. The whole dwelling fabric energy efficiency target is passed by 14.9% (See next section). These high fabric standards provide a passive means of reducing energy usage. The fabric performance is further enhanced by a low air permeability target, providing air tight, draft free dwellings.

Be clean: There is not a local district heat network to connect to. No allowance has therefore been made for this category.

Be Green: An array of photovoltaic (PV) panels is proposed on the roof, providing an on-site source of renewable energy. A heat pump is also proposed. With the decarbonisation of the national grid these provide a low carbon solution to heating dwellings.

PROPOSED SPECIFICATION (Be Green)

ELEMENT	PROPOSED SPECIFICATION	REGULATED LIMIT
EXTERNAL WALLS	All walls $U=0.15 \text{ w/m}^2\text{k}$	$U<0.26 \text{ w/m}^2\text{k}$
ROOF	$U=0.13 \text{ w/m}^2\text{k}$	$U<0.16 \text{ w/m}^2\text{k}$
GROUND FLOOR	$U=0.10 \text{ w/m}^2\text{k}$	$U<0.18 \text{ w/m}^2\text{k}$
WINDOWS	Triple glazed units $U=0.80 \text{ w/m}^2\text{k}$	$U<1.6 \text{ w/m}^2\text{k}$
THERMAL BRIDGES	Thermally model junctions to quantify heat loss through structural junctions.	-
HEATING	High performing air source heat pump selected from SAP database to supply space and water heating.	-
AIR PERMEABILITY	$<3.0 \text{ m}^3/\text{h.m}^3$	$<8 \text{ m}^3/\text{h.m}^3$
VENTILATION	High performing MVHR system selected from SAP database	-
PHOTOVOTAIC POWER (PV)	Install PV array on roof. (Min 2.8KWp- Based on 7panels @ 0.4 KW each)	-



5 RESULTS: ENERGY AND CARBON

The SAP Summary report in Appendix A for the “Be Green” assessment shows the following results:

- Regulated carbon emissions are reduced by 100.3% (DER V's TER)
- Regulated primary energy is reduced by 85% (DPER V's DPER)
- Regulated fabric energy efficiency is improved 14.9% (DFEE V's TFEE)

The proposed installation of a high performing heat pump helps achieve carbon emissions and primary energy usage well below regulated levels. The addition of PV achieves zero regulated emissions, significantly reduces primary energy and raises the predicted EPC to an A rating, reflecting reduced energy bills for residents.

SAP data from the SAP full Calc report was also used to calculate energy usage. This is summarised in the table below.

	SPACE HEATING	WATER HEATING	PUMPS ETC	LIGHTING	PV: IN DWELLING	PV: EXPORTED	TOTAL ENERGY	TOTAL PV
UNIT	KWH/Y	KWH/Y	KWH/Y	KWH/Y	KWH/Y	KWH/Y	KWH/Y	KWH/Y
34 KINGSLEY PLACE	743.7	1172.5	157.1	247.0	1118.9	1299.3	2320.3	2418.2

This data has been entered into the EUI worksheet in the GLC carbon emissions reporting spreadsheet.

A further SAP assessment was run for the “Be Lean” scenario. In this the PV was removed, and the heat pumps replaced with a notional mains gas boiler and heating system. SAP reports for these assessments are in the appendix and resulting carbon emissions are included in the GLC carbon emissions reporting spreadsheet.

Results for both assessments are summarised in the table below:

	CARBON			PRIMARY ENERGY			FABRIC		
	DER	TER	% DER<TER	DPER	TPER	%DPER<TPER	DFEE	TFEE	%DFEE<TFEE
BE GREEN	-0.04	11.82	100.3%	9.37	61.87	85.0%	37.11	43.61	14.9%
BE LEAN	9.56	11.84	19.3%	54.86	61.99	11.5%	37.11	43.61	14.9%



Unregulated carbon emissions and energy use were also calculated.

Calculations are included in Appendix B.

Total unregulated carbon emissions=609 kg/year

Total unregulated energy use=3322 kwh/year

This data has been added to the GLC carbon emissions reporting spreadsheet



6 GLA SUMMARY TABLES

The following shows the summary tables from the GLC carbon emissions reporting spreadsheet. The full spreadsheet is included in Appendix C.

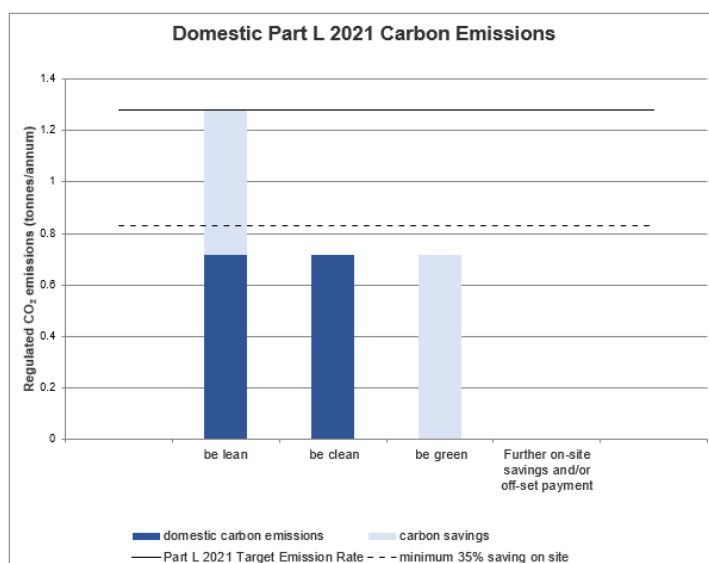
Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential buildings

	Carbon Dioxide Emissions for residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	1.3	0.6
After energy demand reduction (be lean)	0.7	0.6
After heat network connection (be clean)	0.7	0.6
After renewable energy (be green)	0.0	0.6

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for residential buildings

	Regulated residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.6	44%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.7	56%
Cumulative on site savings	1.3	100%
Annual savings from off-set payment	0.0	-
(Tonnes CO₂)		
Cumulative savings for off-set payment	0	-
Cash in-lieu contribution (£)	-12	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development'





7 STRATEGY TO PREVENT OVERHEATING

Prior to construction commencing, a dynamic thermal model will be undertaken following CIBSE's TM59 methodology to demonstrate compliance with Part O Overheating. The property is located in a London postcode identified in Part O as at high risk of overheating. It is vital therefore that this risk is mitigated in the design. Passive means of heat control will be prioritised, with mechanical ventilation kept to a minimum.

Proposed mitigation measures include:

- Inclusion of tinted / low g glazing, to reduce solar gain
- Shading to windows provided by courtyards
- Limited facades of glazing, to control solar gain- particular on southern and western aspects
- A large percentage of opening windows, including secure overnight openings in bedrooms.
- Installation of a MVHR system to provide ventilation
- Inclusion of summer by-pass mode on the MVHR system, to bring in cooler air to the property during hot weather.

A copy of the Good Homes Alliance early stage overheating risk tool is included overleaf. This shows that although the property is located in a high risk area for overheating, the inclusion of the above mitigation measures reduces the risk to a score of 8, Medium risk.



EARLY STAGE OVERHEATING RISK TOOL Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating. The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes



KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING

KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map	South east	4	4
	Northern England, Scotland & NI	0	
	Rest of England and Wales	2	
#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	3	3
	Gr: London, Manchester, Birmingham	2	
	Other cities, towns & dense sub-urban areas	1	

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context	1
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Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant	Day - reasons to keep all windows closed	8	0
	Day - barriers some of the time, or for some windows e.g. on quiet side	4	
	Night - reasons to keep all windows closed	8	
	Night - bedroom windows OK to open, but other windows are likely to stay closed	4	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme	1
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#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels	1
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Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples	3	0
#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures	3	0

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance	1
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#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans	>2.8m and fan installed	2
	> 2.8m	1

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space	>65%	12	0
	>50%	7	
	>35%	4	
#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation	Single-aspect	3	0
	Dual aspect	0	

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6	Full Part	3
	>65%	6 3
	>50%	4 2
	>35%	2 1

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance	Openings compared to Part F purge rates	
	= Part F	+50% +100%
	Single-aspect minimum required	3 4
	Dual aspect	2 3

TOTAL SCORE	8	=	Sum of contributing factors:	11	minus	Sum of mitigating factors:	3
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score >12: Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)	score between 8 and 12: Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)	score <8: Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)
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APPENDIX

APPENDICES KEPT IN A SEPARATE ONLINE FOLDER

LINK: https://drive.google.com/drive/folders/1oJn2Pg8wDWGbaSGUf8GBG4jykpQrZUfb?usp=drive_link

APPENDIX A SAP REPORTS

APPENDIX B : CALCULATIONS FROM SAP DATA

APPENDIX C : GLA CARBON EMISSION REPORTING SPREADSHEET

APPENDIX D: DRAWINGS AND DOCUMENTS



CAVEAT

This document should only be used for the purpose for which it was commissioned. The author shall not be liable for the consequences of using this document for other projects or purposes.

Any advice given, either verbal or written, relates only to the Part L of the Building Regulations (Conservation of Fuel and Power). The suitability of any insulation, building fabric, heating/ventilation system etc should be checked for each development, particularly against fire safety and structural requirements.

REVISION SCHEDULE

Rev	Date	Prepared by	Changes/comments
-	29/03/26	IRF*	First Issue

* Ian Folkard IRF ENERGY LTD Accredited On-Construction Energy Assessor.