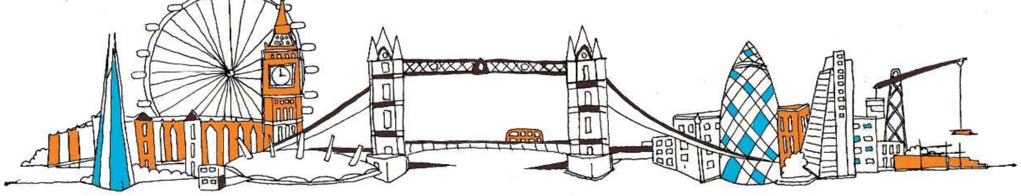
Energy Strategy

3 New Road, London, N8 8TA

On behalf of Barry Shaw

Revision 02

Date: 28th April 2022



REVISION HISTORY

Revision	Issue Date	Description	Issued By	Checked By
00	28/03/2022	First Issue	RP	TW
01	14/04/2022	Minor comments from client	RP	TW
02	28/04/2022	Planning consultant comments incorporated	RP	-

Calculations contained within this report have been produced based on information supplied by the Client and the design team. Any alterations to the technical specification on which this report is based will invalidate its findings.

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CONTENTS

1. EXECUTIVE SUMMARY

1.1 Purpose of the Strategy

This Energy Strategy has been produced by Energist UK on behalf of Barry Shaw ('the Applicant').

It will set out the climate change mitigation measures incorporated by the Applicant as part of the development scheme: 3 New Road, London, N8 8TA ('the Development').

The Strategy is written in support of the full planning application being submitted to London Borough of Haringey.

The Strategy will demonstrate measures taken by the Applicant to comply with:

i) National Planning Policy Framework.

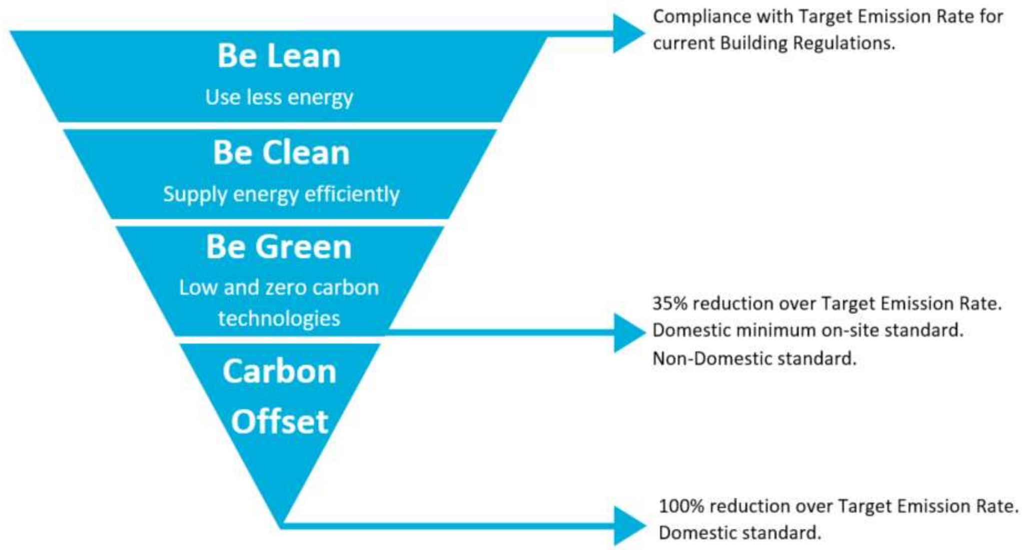
ii) Local Planning Policy requirements to:

  - *'Apply the energy hierarchy to to minimise energy use in order to meet, and if possible exceed, minimum carbon dioxide targets'*

iii) Energy officer comments to align with the approved energy strategy submitted in 2016 which achieved a 37% site wide reduction in emissions.

The Energy Strategy describes demand-reduction measures, energy-efficiency measures and low-carbon and renewable energy in relation to how the Applicant meets the objectives of the energy hierarchy: Be Lean, Be Clean, Be Green. Refer to Figure 1.

Figure 1. The Energy Heirarchy.



1.2 Design Measures

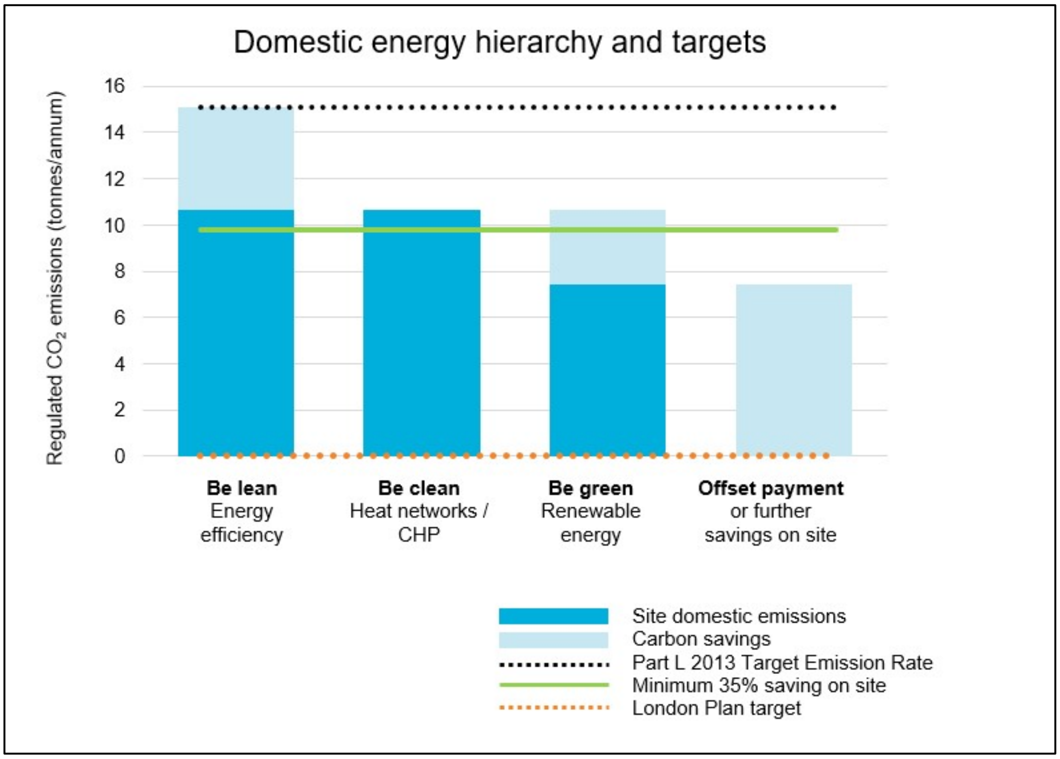
The Strategy concludes that the following combination of measures, summarised here in Table 1, are included in the design of the Development.

Table 1. Measures incorporated to deliver the energy standard.

Be Lean	▪ Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs. ▪ High-efficiency double-glazed windows throughout. ▪ Efficient-building services including high-efficiency heating systems. ▪ Low-energy lighting throughout the building.
Be Clean	▪ No measures incorporated.
Be Green	▪ An ASHP has been incorporated to serve the heating and hot water demand for all dwellings. This will have a SCOP of 3.2.

The impact of these design measures and low-carbon and renewable energy solutions, in terms of how the Applicant delivers their commitment to the energy hierarchy for domestic elements of the development is illustrated in Figure 2 overleaf.

Figure 2. The Domestic Energy Hierarchy.



1.3 Domestic Buildings

The CO_2 emissions at each stage of the energy hierarchy and percentage savings for domestic buildings are set out in Tables 2 and 3.

Table 2. CO_2 emissions after each stage of the Energy Hierarchy for Domestic Buildings.

Carbon dioxide emissions after each stage of the Energy Hierarchy for domestic buildings		
	Carbon dioxide emissions for domestic buildings Tonnes CO_2 per annum	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations	20.13	4.61
After energy demand reduction	13.79	4.61
After heat network / CHP	13.79	4.61
After renewable energy	9.64	4.61

Table 3. Site-Wide Regulated CO_2 emissions and Savings.

Carbon dioxide emissions after each stage of the Energy Hierarchy for site			
	Total regulated emissions	**CO_2 savings**	**Percentage savings**
	Tonnes CO_2 per annum		%
Part L 2013 Baseline	20.13	-	-
Be Lean	13.79	6.34	31.5%
Be Clean	13.79	0.00	0.0%
Be Green	9.64	4.15	20.6%
Total		10.49	52.1%

2. INTRODUCTION

2.1 Site Description

This Energy Strategy has been prepared for the change of use residential development scheme at 3 New Road, London, N8 8TA. This falls under the jurisdiction of the London Borough of Haringey.

The Development consists of seven domestic units converted from the previous non-domestic space on the scheme.

The site lies to the North of New Road, bounded by residential dwellings to all sides.

Map 1. Site location for 3 New Road, London. Existing site plan, illustrating previously approved commercial space to the ground floor.

Source: Hampson Williams, April 2016

2.2 Purpose of the Energy Strategy

The Strategy will demonstrate measures taken by the Applicant to comply with:

i) National Planning Policy Framework.

iv) Local Planning Policy requirements to:

- *'Apply the energy hierarchy to to minimise energy use in order to meet, and if possible exceed, minimum carbon dioxide targets'*

ii) Energy officer comments to align with the approved energy strategy submitted in 2016 which achieved a 37% site wide reduction in emissions.

For a detailed summary of the planning policy requirements and design guidance specific to the Development, refer to Appendix 2.

The way in which the Applicant incorporates climate change mitigation measures and meets the CO_2 reduction target at 3 New Road, London will be explained in this Strategy as follows:

- **The Baseline:** The Development's baseline energy demand: This will be calculated to establish the minimum on-site standard for compliance with AD L1B 2013. The baseline is calculated using a mains gas heating system.
- **Be Lean:** The Development's Dwelling Emission Rate (DER) will be calculated to explain how the Applicant's design specification has led to a reduced energy demand and an improved fabric-energy efficiency. The better the design of the building fabric in terms of, for example, insulation, air tightness and orientation to maximise solar gain, the less energy required to heat the dwelling and so the better the fabric energy efficiency.
- **Be Clean:** The potential to provide energy to the development in an efficient way, by either connecting to a District Heat Network (DHN) or installing on-site Combined Heat and Power (CHP), will be assessed and viability concluded.
- **Be Green:** Low-carbon and renewable energy technologies will be assessed for their suitability and viability in relation to the Development. Solutions will be put forward for the development and the resulting CO_2 emission savings presented.

2.3 Methods

Energist UK has used SAP 2012 methodology to calculate energy demand for three sample dwellings. The data has been extrapolated to reflect more accurately the expected CO_2 emission rates and energy demand for all proposed dwellings included in the development proposals for this site.

3. BASELINE ENERGY DEMAND

3.1 Introduction

In order to measure the effectiveness of demand-reduction measures, it is first necessary to calculate the baseline energy demand and this has been assessed using SAP 2012 methodology and ADL1B minimum standards. The baseline is calculated using a mains gas heating system.

The resulting AD L1B 2013 baseline for 3 New Road, London has been calculated using Part L model designs which have been applied to the Applicant's Development details. The TER, or baseline energy demand, represents the maximum CO_2 emissions that are permitted for the Development in order to comply with AD L 2013.

3.2 The Development Baseline

The resulting baseline emissions, representing the total maximum CO_2 emissions permitted for the Development under L1B has been calculated as 20.13 tonnes CO_2/year. To ensure compliance with AD L 2013, CO_2 emissions should not exceed this figure.

4. BE LEAN – REDUCED ENERGY DEMAND

4.1 Introduction

The domestic, change of use development scheme at 3 New Road, London achieves a high quality, sustainable design by integrating the following passive and active design measures to reduce energy demand:

- Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs.
- High-efficiency double-glazed windows throughout.
- Efficient-building services including high-efficiency heating systems.
- Low-energy lighting throughout the building.

4.2 The Development - Reduced Energy Demand

The Applicant's design specification and intended demand-reduction measures for the Development have been modelled using the same SAP 2012 methodology as before. This allows us to assess the effectiveness of Be Lean measures as a percentage reduction in CO_2 emissions over the Baseline for domestic schemes.

The total calculated CO_2 emissions for 3 New Road, London is 13.79 tonnes CO_2/year which is a reduction of 31.5% or 6.34 tonnes CO_2/year over the Baseline. Refer to Appendix 3 for SAP Results and Table 5 for the Be Lean design specification.

Table 4. Be Lean design specification for 3 New Road, London

Element	Be Lean Design Specification
Ground Floor U-Value ($W/m^2.K$)	0.09
External Wall U-Value ($W/m^2.K$)	0.17
Party Wall U-Value ($W/m^2.K$)	0 (fully filled and sealed)
Roof – Flat U-Value ($W/m^2.K$)	0.2
Glazing U-Value – including Frame ($W/m^2.K$)	1.6
Glazing g-Value	0.63
Door U-Value ($W/m^2.K$)	1.3
Design Air Permeability	15 (assumed)
Space Heating	88.5% efficient gas combi boiler
Heating Controls	Time and temperature zone control
Domestic Hot Water	From main heating system.
Ventilation	Natural Ventilation
Low Energy Lighting	100%
Thermal Bridging	Y – 0.15

4.3 Conclusion

By incorporating sustainable design and energy-reduction design measures at 3 New Road, London, the Applicant will reduce regulated CO_2 emissions by 31.5% over the AD L1B 2013 baseline.

Table 5. CO_2 emissions and Be Lean demand-reduction measures for the Development.

Carbon dioxide emissions after each stage of the Energy Hierarchy for site			
	Total regulated emissions	CO_2 savings	Percentage savings
	Tonnes CO_2 per annum		%
Part L 2013 Baseline	20.13	-	-
Be Lean	13.79	6.34	31.5%

5. BE CLEAN – SUPPLY ENERGY EFFICIENTLY

Steps have been taken by the Applicant to reduce the energy demand of the Development as far as is feasible.

The next step in the energy hierarchy is to consider how the remaining energy demand can be met and whether there is the potential for this to be done through the mechanism of establishing and/or linking up with existing or planned decentralised energy systems.

To ensure compliance with the Greater London Authority's energy hierarchy, the potential to supply energy efficiently to the Development at 3 New Road, London and further reduce regulated CO_2 emissions through Be Clean measures, is evaluated.

5.1 Policy Drivers

This part of the assessment in line with planning policy SI 3 of The London Plan (2021) and the requirements of the GLA Energy Assessment Guidance (2020).

To ensure compliance with the energy hierarchy, the potential to supply energy efficiently to the development and further reduce regulated CO_2 emissions through 'Be Clean' measures, has been evaluated. This has been done with attention to the following hierarchy for selecting an energy system:

1. *Connection to an area wide heat network.*
2. *Communal heating system:*
    - *Site-wide heat network.*
    - *Building-level heating system.*
3. *Individual heating system.*

5.2 District Heat Network Viability

District Heat Networks (DHN), also referred to as either district energy systems or district heating schemes, produce steam, hot water or chilled water at a central energy centre. The steam or water is distributed in pre-insulated pipework, to individual buildings for space heating, domestic hot water and air conditioning. As a result, individual buildings served by a DHN do not require their own boilers or chillers (source: UK District Energy Association.)

The London Heat Map has been consulted to establish whether the Development lies within proximity of an existing DHN.

Map 2. 3 New Road within the context of the London Heat Map.

Key:

Heat Mapping Decentralised Energy Potential
Existing DHN
Potential DHN
Development Location

5.2.1 Application viability

The Development does not lie within the vicinity of an existing DHN. The closest live DHN is the Collendale Network which is approximately 5.6 kilometres to the East.

5.3 Combined Heat and Power

Combined Heat and Power (CHP) is a relatively simple technology comprising of an engine (usually gas fired, but can be oil or biomass fired) which fires a generator producing on-site electricity. This process also generates heat as a by-product which can then be used to provide space heating and hot water. CHP systems can be small scale, used in single buildings, or large scale and used in a community or district heating network. As electricity is produced on site, distribution losses in comparison to the national grid are minimal and the heat by-product is captured instead of being wasted. As a result CHP provides an efficient, low carbon electricity and heat generation solution.

The following extracts from the GLA guidance on preparing energy assessments (2021) detail situations where CHP is unlikely to be a viable solution:

Small-medium residential development (eg. containing fewer than 500 apartments).

At this scale it is generally not economic to install CHP in residential led, mixed use developments (and where CHP is installed it tends to have lower electricial efficiencies). Due to the small landlord electrical demand, CHP installed to meet the base hear load would require the export of electricity to the grid. However, the administrative burden of managing CHP electricity sales at this small scale where energy service companies (ESCOs) are generally not active, and the low unit price available for small volumes of exported CHP electricity, means it is generally uneconomic for developers to pursue. This can lead to CHP being installed but not operated.

Non-domestic developments with a simultaneous demand for heat and power for less than 5,000 hours per annum.

Examples of such developments may include offices and schools.

5.3.1 Installation considerations

- The sizing of a CHP system is critical to its efficiency and operation. An oversized system will require a large buffer tank to absorb excess heat and will often have to turn off. This is not good for long term operation.
- Systems should therefore be undersized and meet base heating demand (usually hot water demand) to ensure continuous operation.
- Large scale CHP systems will require sufficient plant room to accommodate the engine and buffer vessel.
- Large systems suitable for developments of 500 or more units, although can be viable on smaller schemes.
- Systems perform well where there is a consistent demand for heat.
- Export of electricity can sometimes require an upgrade to a local substation.
- Flue design important.
- Design needs to be bespoke to the needs of the development.

5.3.2 Approximate upfront costs (TBC by supplier)

- Costs vary dependant on the size of the system. Small 24 kWt/1 kWe systems may start at £10,000 with larger systems costing substantially more.

5.3.3 Advantages

- There are significant CO_2 reductions for large-scale development (multiple apartment blocks) where there is a consistent requirement for heat.

5.3.4 Disadvantages

- Not financially viable on smaller developments.
- Plant room space required.
- Will not perform well where there is inconsistent demand for heat.
- Up-front and ongoing costs are higher than commercial gas boilers.

5.3.5 Application Viability

CHP is not considered suitable for the development. It is not expected that the simultaneous demand for heat and power will exceed 5,000 hours per annum and so, in accordance with the London Plan and Mayor of London guidance, is considered too small, and the anticipated heat demand considered too low for CHP to be an economically viable option. CHP is also not aligned with the New London Plan or the upcoming changes to Part L of the building regulations.

5.4 Conclusion

As the provision of onsite CHP is not considered viable for the Development, and as district heating networks are not currently available in this area, the Applicant should consider alternative options for providing heating in the building.

This will be covered in the following Be Green section.

There is no reduction to be shown via the Be Clean method.

6. BE GREEN – LOW-CARBON AND RENEWABLE ENERGY

6.1 Introduction

The Applicant adopts a fabric-first approach as the priority solution for this Development and steps have been taken to reduce energy demand through passive measures and high-quality sustainable design. The planned integration of efficient building fabric and building services has been modelled and is predicted to lead to an enhancement over Part L1B of the Building Regulations 2013.

The next step in the energy hierarchy is referred to as Be Green. To ensure compliance with the Greater London Authority's energy hierarchy, opportunities to supply energy through low-carbon and renewable energy technologies will be assessed for their feasibility and solutions presented for the Development at 3 New Road, London.

The selected solution will be put forward together with the resulting CO_2 emission savings.

Viability of the following low-carbon and renewable energy technologies have been considered:

- Wind
- Solar
- Aerothermal
- Geothermal
- Biomass

6.3 Wind	*The ability to generate electricity via a turbine or similar device which harnesses natural wind energy. This could be considered as an onsite solution to reducing carbon emissions (turbines included within the development), or offsite (investing financially into a nearby wind farm).*
Installation considerations	▪ Wind turbines come in a variety of sizes and shapes. Turbines of 1 Kw can be installed to single house and large-scale turbines of 1-2 MW can be installed on a development to generate electricity to multiple dwellings and other buildings. In both instances the electricity generated can be used on site or exported to the grid. Vertical- or horizontal-axis turbines are available. ▪ A roof-mounted 1 kW micro wind system costs up to £3,000. A 2.5 kW pole-mounted system costs between £9,900 and £19,000. A 6 kW pole-mounted system costs between £21,000 and £30,000 (taken from the Energy Saving Trust, TBC by supplier) ▪ Local average wind speed is a determining factor. A minimum average wind speed of 6 m/s is required. ▪ Noise considerations can be an issue dependent on density and build-up of the surrounding area. ▪ Buildings in the immediate area can disrupt wind speed and reduce performance of the system. ▪ Planning permission will be required along with suitable space to site the turbine, whether ground installed or roof mounted.
Advantages	▪ Generation of clean electricity which can be exported to the grid or used onsite. ▪ Can benefit from the Feed in Tariff, reducing payback costs.
Disadvantages	▪ Planning restrictions and local climate often limit installation opportunities. ▪ Annual maintenance required. ▪ High initial capital cost. It is usual for an investor to consider a series of turbines to make the investment financially sound.

Development feasibility

✗

- Installing a large turbine in an area such as this is not considered to be appropriate due to its appearance and physical impact on the built-up environment. Residents' and neighbours' concerns may include the look of the turbine, the hum of the generator and the possibility of stroboscopic shadowing from the blades on homes.

- Wind speed has been checked for the development scheme using the NOABL wind map: http://www.rensmart.com/Weather/BERR. The wind speed at ten metres for the development scheme is 4.5 metres per second (m/s) which is below the minimum of 5 m/s and threshold for technical viability.

- Typical payback times for a single turbine are expected to be greater than 15 years which means that the cost of installing and maintaining a single wind turbine is not considered a commercially-viable option.

6.4 Solar PV and Solar Thermal	*The ability to generate energy (either electricity, hot water or a combination of the two) through harnessing natural solar energy. This could include the use of solar thermal panels, photovoltaic (PV) panels, or a combined solution. PV panels, similarly to turbines, can be considered both on and offsite.* Solar Photovoltaics convert solar radiation into electricity which can be used on site or exported to the national grid. Solar Thermal generates domestic hot water from the sun's radiation. Glycol circulates within either flat plate or evacuated tube panels, absorbing heat from the sun, and transferring this energy to a water cylinder. A well designed solar thermal system will account for 50-60% of a dwelling's annual hot water demand. Sizing the system to meet a higher demand will lead to excess heat generation in the summer months, and overheating of the system.
Installation considerations	▪ Operate most efficiently on a south-facing sloping roof (between 30 and 45-degree pitch.) ▪ Shading must be minimal (one shaded panel can impact the output of the rest of the array.) ▪ Panels must not be laid horizontally on a flat roof as they will not self-clean. Panels will therefore need to be installed at an angle and with appropriate space between them, to avoid over-shading. ▪ Large arrays may require upgrades to substations if exporting electricity to the grid. ▪ Local planning requirements may restrict installation of panels on certain elevations. ▪ Installation must take into account pitch and fall of the roof, along with any additional plant on the roof to ensure there is sufficient room. ▪ The average domestic solar PV system is 4kWp and costs £5,000 - £8,000 (including VAT at 5 per cent) - (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Relatively straightforward installation, connection to landlord's supply and metering.

	▪ Linear improvement in performance as more panels are installed. ▪ Maintenance free. ▪ Installation costs are continually reducing. ▪ Can benefit from the Feed in Tariff to improve financial payback.
Disadvantages	▪ Not appropriate for high-rise developments, due to lack of roof space in relation to total floor area. ▪ With Solar Thermal, performance is limited by the hot water demand of the building – system oversizing will lead to overheating.
Development feasibility ✗	▪ The suitability of Solar panels has been considered for this Development and are concluded as a technically-viable option. ▪ Solar PV has been incorporated to feed the existing flats on the development and all available roof space has been maximised already. There is no further space available for PV for these change of use units.

6.5 Aerothermal

The transfer of latent heat in the atmosphere to a compressed refrigerant gas to warm the water in a heating system. This includes air to water heat pumps and air conditioning systems.

Air Source Heat Pumps (ASHPs) extract heat from the external air and condense this energy to heat a smaller space within a dwelling or non-domestic building. A pump circulates a refrigerant through a coil to absorb energy from the air. This refrigerant is then compressed to raise its temperature which can then be used for space heating and domestic hot water.

They can feed either low-temperature radiators or underfloor heating and often have electric immersion heater back-up for the winter months.

Installation Considerations	▪ ASHPs operate effectively in buildings with a low energy demand, as they emit low levels of energy suitable for maintaining rather than dramatically increasing internal temperatures. It is therefore vital that the dwelling has a low heating demand to ensure the system can provide appropriate space-heating capability. ▪ Underfloor heating will give the best performance but oversized radiators can also be used. ▪ Immersion heater back-up required to ensure appropriate Domestic Hot Water (DHW) temperature in winter months. ▪ Noise from the external unit can limit areas for installation. ▪ £7,000-£11,000 per dwelling (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Air source systems are a good alternative solution to providing heating and hot water to well-insulated, low heat loss dwellings. ▪ They require additional space when compared to a gas boiler. Space for an external unit is needed, as is space for the hot water cylinder and internal pump. ▪ Heat pumps are generally quiet to run, however if a collection of pumps were used, this could generate a noticeable hum while in operation. ▪ Running costs between heat pumps and modern gas boilers are comparable.
Disadvantages	▪ Residents need to be made aware of the most efficient way of using a heat pump; as the low flow rates used by such a system means that room temperature cannot be changed as reactively as a conventional gas or oil boiler system. ▪ Will not perform well in homes that are left unoccupied and unheated for a long period of time. ▪ Back-up immersion heating can drastically increase running costs. ▪ Noise and aesthetic considerations limit installation opportunities.

Development feasibility

✓

- ASHPs are considered a technically-viable option for this development scheme.
- ASHPs are aligned with the New London Plan and the upcoming changes to part L of the building regulations which seeks to move away from fossil fuels and on site combustion in favour of low energy al electric systems.

6.6 Geothermal

The transfer of latent heat from the ground to a compressed refrigerant gas to warm the water in a heating system. This includes ground source heat pumps. Heat can be collected through the use of either horizontally laid or vertically installed coils.

Ground Source Heat Pumps (GSHPs) operate on the same principle as an Air Source Heat Pump (ASHP) in that they extract heat from a source (in this instance the ground) and compress this energy to increase temperature for space heating and hot water. Pipework is installed into the ground, either through coils or in bore holes and piles, circulating a mix of water and antifreeze to extract energy from the ground, where the year-round temperature is relatively consistent (approx. 10℃ at 4 metres depth). This leads to a reliable source of heat for the building.

Again, an electrically powered pump circulates the liquid and powers the compressor, however annual efficiencies for GSHPs tend to be higher than those of ASHPs.

Installation considerations

- Require appropriate ground conditions to sink piles/bore holes or excavate for coils (which also require a large area of land.)
- Decision between coils or piles can lead to significant extra cost.
- Need to consider whether low temperature output is fed through underfloor heating (most efficient) or oversized radiators.

	▪ Similar to ASHPs, perform best in well-insulated buildings with a low heating demand. ▪ Electric immersion heater required for winter use. ▪ £11,000-£15,000 per dwelling dependent on the size of the system (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Perform well in well-insulated buildings, with limited heating demand. ▪ More efficient than ASHPs.
Disadvantages	▪ The coils can be damaged by natural earthworks and by intensive gardening practices – occupants would need to be aware of the location of the coils for this system, and how to operate the system efficiently. Coils may also be damaged within the dwelling where the circuit is connected to the internal unit. ▪ Will not perform well in buildings that are left unoccupied and unheated for a long period of time. ▪ Back up immersion heating can drastically increase running costs. ▪ Large area of ground needed for coil installation.
Development feasibility ✗	▪ GSHPs are not considered a technically-viable option for this development scheme as there are physical constraints in terms of ground conditions and area available for installation. ▪ The capital installation cost would also be high which leads us to the conclusion that GSHPs would not be a commercially-viable option for this development scheme.

6.7 Biomass	*Providing a heating system fuelled by plant based materials such as wood, crops or food waste.* Biomass boilers generate heat for space heating and domestic hot water through the combustion of biofuels, such as woodchip, wood pellets or potentially biofuel or bio diesel. Biomass is considered to be virtually zero carbon. They can be used on an individual scale or for multiple dwellings as part of a district-heating network. A back-up heat source should be provided as consistent delivery of fuel is necessary for continued operation.
Installation considerations	▪ Biomass boilers are larger than conventional gas-fired boilers and also require what can be significant storage space for the fuel source. This needs to be considered at planning stage to ensure an appropriate plant room can be provided. ▪ Flue required to expel exhaust gases – design needs to be in line with the requirements of the Building Regulations. ▪ Need to consider whether fuel deliveries will be reliable and consistent to the location of the site (especially relevant in rural areas) and whether the plant room can be easily accessed by the delivery vehicle. ▪ £9,000-£21,000 per dwelling dependent on size (taken from Energy Saving Trust, TBC by Supplier).
Advantages	▪ Considerable reduction in CO_2 emissions.
Disadvantages	▪ Limited reduction in running costs compared to A-rated gas boilers, but at a substantially higher up-front cost. ▪ Plant room space required for boiler and storage. ▪ Dependent on consistent delivery of fuel. ▪ Ongoing maintenance costs (need to be cleaned regularly to remove ash.)
Development Feasibility	▪ Biomass is not considered a technically-viable option for the development scheme. The primary reason for this is down to the Development's location within the

✗	context of Inner City London and the negative environmental impact of high levels of NOx gases that are emitted from biomass boilers and the subsequent impact on local air quality. This is contrary to planning policies for air quality in London. ▪ There are, however, concerns regarding a sustainable supply of biomass to the site. ▪ The capital installation cost would, however, be high which leads us to the conclusion that biomass would not be a commercially-viable option for this development scheme.

6.8 Conclusion

The following low-carbon and renewable energy technologies, summarised here in Table 6, are considered potentially-viable options for the Development at 3 New Road, London.

Table 6: Summary of Feasibility for 3 New Road, London.

✓	▪ Aerothermal
✗	▪ Solar thermal ▪ Solar PV ▪ Geothermal ▪ Biomass ▪ Wind

The applicant has opted to install an air source heat pump to serve the heating and hot water demand of these seven dwellings. It will be 320% efficient.

7. CONCLUSIONS AND RECOMMENDATIONS

The Applicant demonstrates commitment to delivering climate change mitigation measures at 3 New Road, London as follows:

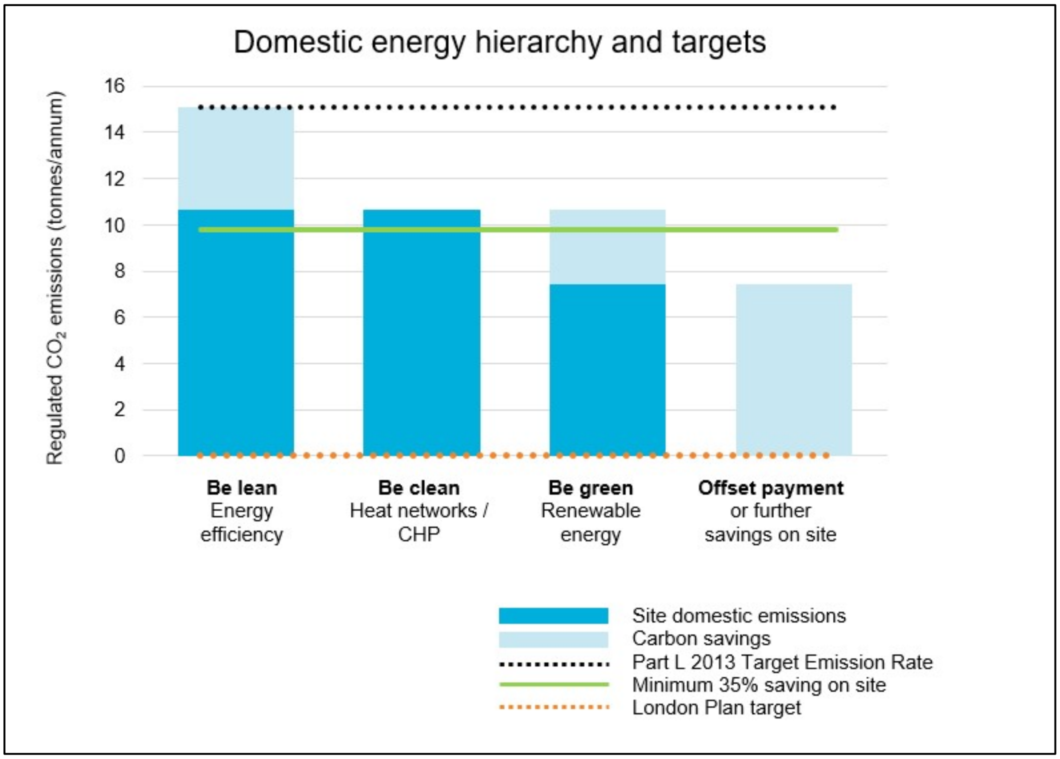
- The Development has been designed to achieve a total reduction in CO_2 emissions of 52.1% over the AD L1B 2013 baseline through Be Lean, Be Clean and Be Green measures and successfully exceeds the minimum of 37% reduction in CO_2 emissions over Approved Document Part L (AD L1B) 2013 for the Development in line with the approved energy strategy submitted in 2016.

Table 7. Measures incorporated to deliver the energy standard.

Be Lean	▪ Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs. ▪ High-efficiency double-glazed windows throughout. ▪ Efficient-building services including high-efficiency heating systems. ▪ Low-energy lighting throughout the building.
Be Clean	▪ No measures incorporated.
Be Green	▪ An ASHP has been incorporated to serve the heating and hot water demand for all dwellings. This will have a SCOP of 3.2.

The impact of these design measures and low-carbon and renewable energy solutions, in terms of how the Applicant delivers their commitment to the energy hierarchy for the development is illustrated in Figure 2 overleaf.

Figure 2. The Domestic Energy Hierarchy.



7.1 Domestic Buildings

The CO_2 emissions at each stage of the energy hierarchy and percentage savings for domestic buildings are set out in Tables 8 and 9 below.

Table 8. CO_2 emissions after each stage of the Energy Hierarchy for Domestic Buildings.

Carbon dioxide emissions after each stage of the Energy Hierarchy for domestic buildings		
	Carbon dioxide emissions for domestic buildings Tonnes CO_2 per annum	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations	20.13	4.61
After energy demand reduction	13.79	4.61
After heat network / CHP	13.79	4.61
After renewable energy	9.64	4.61

Table 9. Site-Wide Regulated CO_2 emissions and Savings.

Carbon dioxide emissions after each stage of the Energy Hierarchy for site			
	Total regulated emissions	**CO_2 savings**	**Percentage savings**
	Tonnes CO_2 per annum		%
Part L 2013 Baseline	20.13	-	-
Be Lean	13.79	6.34	31.5%
Be Clean	13.79	0.00	0.0%
Be Green	9.64	4.15	20.6%
Total		10.49	52.1%

8. APPENDICES

APPENDIX 1: LIST OF ABBREVIATIONS

AD L 2013	Approved Document Part L of Buildings Regulations 2013
ASHP	Air Source Heat Pump
CHP	Combined Heat & Power
DER	Dwelling Emission Rate
DHN	District Heat Network
DHW	Domestic Hot Water
ESCO	Energy Services Company
GSHP	Ground Source Heat Pump
LPA	Local Planning Authority
PV	Photovoltaics
SAP	Standard Assessment Procedure
L1B Baseline	The baseline established based on notional U-values which are the maximum allowable under L1B for a change of use scheme.

APPENDIX 2. PLANNING POLICY AND DESIGN GUIDANCE.

The Climate Change Act (2008)

Passed in November 2008, the Climate Change Act mandated that the UK would reduce emissions of six key greenhouse gases, including Carbon Dioxide, by 80% by 2050.

As a consequence, the reduction of carbon dioxide emissions is at the forefront of National, Regional and Local Planning Policy, along with continuing step changes in performance introduced by the Building Regulations Approved Document L (2013).

Approved Document L (2013)

This development is subject to the requirements of Approved Document L (2013). AD L 2013 represented an approximate reduction of 6% in the Target Emission Rate (Kg/CO_2/sqm per annum) over the requirements of Approved Document L (2010) for residential development and an aggregate 9% reduction for non-residential development. AD L (2013) also sees the introduction of a Fabric Energy Efficiency Target, a measure of heating demand (kW hrs/sqm per annum) to ensure new-build dwellings with low-carbon heating systems still meet satisfactory energy-efficiency standards.

National Policy 2021

The National Planning Policy Framework encourages Local Planning Authorities to '*support the transition to a low carbon future in a changing climate, taking full account of flood risk and costal change' (*NPPF paragraph 152), *'whilst taking a proactive approach to mitigating and adapting to client change, taking into account the long-term implication for flood risk, costal change, water supply, biodiversity and landscapes, and the risk of over shading from rising temperatures'*. (NPFF Paragraph 153).
Paragraph 155, upholds the requirement for Local Plans to: *'To help increase the use and supply of renewable and low carbon energy and heat, plans should: a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts); b) consider identifying suitable areas of renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for collocating potential heat customers and suppliers.'*
In paragraph 157, NPPF stipulates that local planning authorities should take account of the benefits of decentralised energy and passive design measures as a means of energy efficiency in new development: *'In determining planning applications, local planning authorities should expect new development to: a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not*

feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.'
London Borough of Haringey, Development Management DPD (2017)
Policy DM21: Sustainable Design, Layout and Construction A All new development, including building and landscape works, will be expected to consider and implement sustainable design, layout and construction techniques. Proposals should: a Apply the energy hierarchy to minimise energy use in order to meet, and if possible exceed, minimum carbon dioxide reduction requirements; b Apply the cooling hierarchy to reduce the potential for overheating and limit reliance on mechanical air conditioning systems; c Maximise opportunities to enhance biodiversity on-site, including through appropriate landscaping, Sustainable Drainage Systems, living roofs and green walls d Wherever possible, use building materials with high environmental performance ratings; and e Seek opportunities for locally sourced labour. B The Council will support appropriate measures to sustainably retrofit existing homes and nonresidential buildings. C Proposals that fail to demonstrate adequate consideration for sustainable design, layout and construction techniques will be resisted. D 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
Energy Officer Comments (June 2021)

Our ref: HGY/2021/0929
Contact: Gareth Prosser

Date: 08/06/2021

Town and Country Act 1990 (As amended)

Location:	Land To Rear Of 3 New Road N8 8TA
Proposal:	Change of use and conversion of the ground, first and second floors from (vacant) Class B1 to provide 7no. self-contained flats (the application does not propose or involve any external physical alterations to the existing facades of the property).

Carbon Management Response 08/06/2021

Documents submitted

In preparing this consultation response, we have reviewed Design and Access Statement, proposed plans and documents approved under HGY/2016/1562.

Approved office space (2016)

The existing office space has been built in accordance with a planning permission HGY/2016/1562 and subsequent approved amendments. The Energy Strategy (dated April 2016) by Energist proposed a site-wide reduction of 37% in emissions (including the 9x residential homes and office space).

A screenshot of the office Be Lean design specification from the Energy Strategy has been copied below (this is much less efficient than the approved residential flats):

Element	Be Lean Design Specification
Ground Floor U-Value (W/m².K)	0.17
Exposed Floor U-Value (W/m².K)	0.2
External Wall U-Value (W/m².K)	0.35
Roof – Sloping U-Value (W/m².K)	0.2
Roof – Flat U-Value (W/m².K)	0.2
Glazing U-Value – including Frame (W/m².K)	1.6
Door U-Value (W/m².K)	1.3
Design Air Permeability	3
Space Heating	Air Source Heat Pump serving all office spaces (% reduction represented in figures for Be Green).
Hot Water	Combi-boiler at 91% efficiency
Ventilation	System 4, Mechanical Ventilation and Heat Recovery with SFP of 1.2 W/l/s and HR efficiency of 80% serving all office spaces.
Low Energy Lighting	5 W/sqm throughout. Daylight sensors to offices; auto on/dimmed to circulation areas; auto on/off to meeting room.
Thermal Bridging	Appendix R values

Change of Use application (2021)

The development includes features such cedar cladding, green roof, large windows, double height spaces, and outdoor planting.

This application proposes:

- Landscaping improvements, and a provision of a small storage and hangers for bikes. This is supported.
- Splitting of the existing outdoor space at rear between two ground floor apartments to create private terraces. Other flats would not benefit from dedicated outdoor space, instead, they have been designed to exceed basic internal space standards.
- The car-free nature of this part of the development is supported.

No detail has been provided about the revised Energy Strategy for this changed use, this should be addressed within this application.

Clarifications to address

- What is the proposed maximum water use? Has this been adapted to residential use?
- What are the integrated energy saving measures? Have they been adapted to residential use?
- The applicant should include provision for food waste bins.
- How has the heating strategy with air source heat pumps been changed to suit the residential uses? How will the space and hot water demand be met?
- How has the MVHR strategy been amended to serve the new 7 residential homes? Where will the units and ducting be located?
- This application should be accompanied by the SAP worksheets to demonstrate these residential units meet the carbon reduction requirements.
- Do flats 1 and 2 have sliding doors? Would it be possible to add a private terrace space (including buffer planting to surround this) for flats 1 and 2 next to the windows facing the car park? This would improve outlook and reduce looking into the flat. Are these parking spaces used? Who are they allocated to?
- Are the bike hangars outside the bedroom for flat 3 intended for visitors?
- Will the bedroom in flat 2 and bedroom 2 in flat 4 have enough daylight?
- Are there windows on the southern façade of L/K/D of flat 6? Will this be light enough?
- Has overheating been mitigated for the proposed flats? Particularly for southern/south-western facades. Please provide evidence that the cooling hierarchy has been followed. Please also submit the Good Homes Alliance overheating checklist (link here).
- The wall u-value of the office space would not meet the Building Regs Part L1A limiting fabric parameters. How will this be addressed?

Conclusion

Further information is required so we cannot currently support this application on carbon reduction grounds.

APPENDIX 3: SAP RESULTS.

Baseline, Be Lean and Be Green SAP reports to be sent separately.