LOVE
DESIGN
STUDIO

May 2023

61 Redington Road

Energy and Sustainability Statement

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May 2023
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Section Zero

0 Executive Summary

Executive Summary

An assessment of the sustainability and energy credentials has been carried out for the proposed development at 61 Redington Road, Hampstead, London, NW37RP situated within the jurisdiction of the London Borough of Camden.

The proposal is to convert the three existing residential units into one family dwelling and a one-bedroom flat at the lower ground floor level.

The energy strategy follows the energy hierarchy; Use Less Energy (Be Lean), Supply energy efficiently (Be Clean) and use Renewable and low carbon energy (Be Green) as per local policy requirements.

The energy strategy has been set out within this report and the scheme meets an on-site cumulative **CO_2 reduction of 81%.**

The scheme will continue to integrate the core sustainability principles stemming from Local Development Framework within its design, with a focus on maximising the reuse of the building, lowering the embodied carbon associated with the proposal.

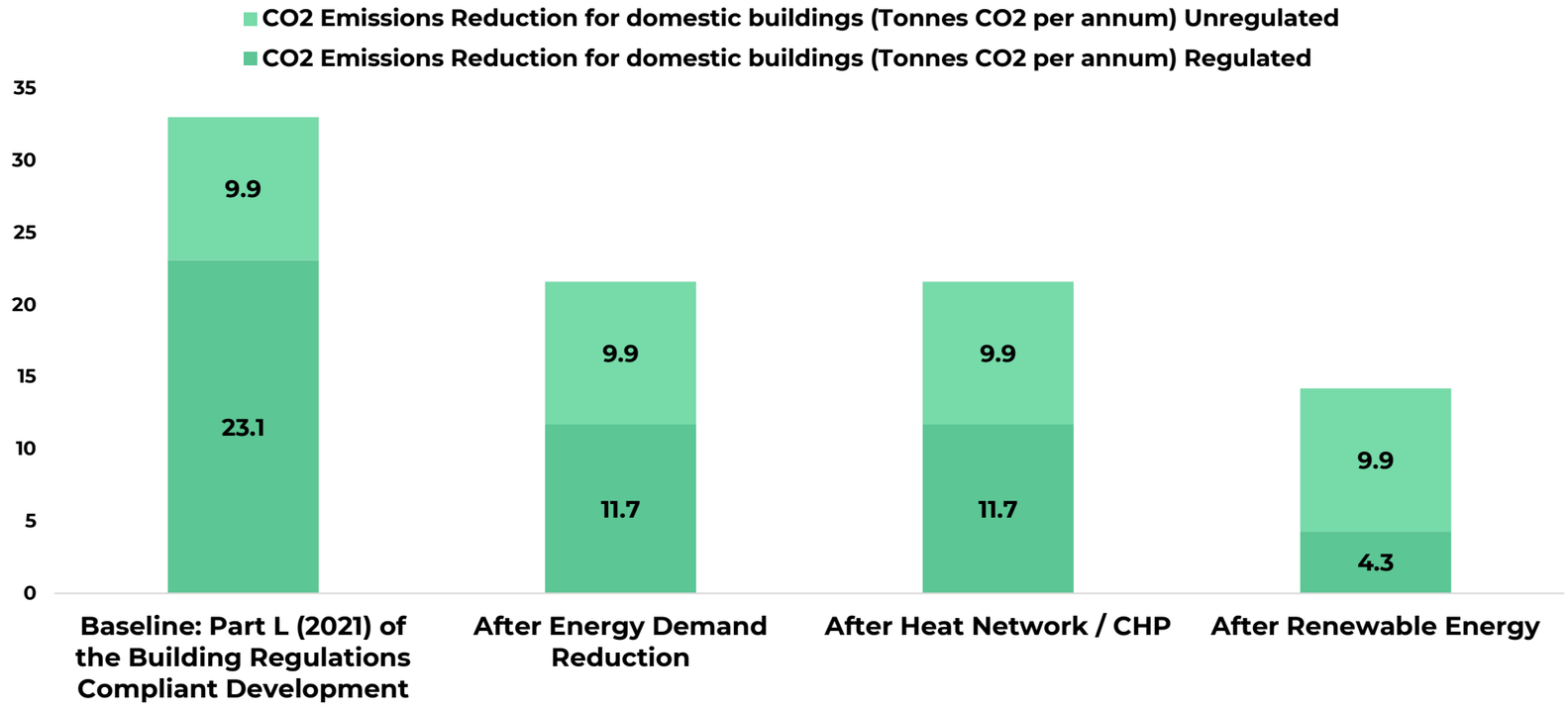


Figure 1: Total site-wide savings at each stage of the energy hierarchy

*Table 1: Total site-wide savings at each stage of the energy hierarchy **

	Regulated domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	**(%)***
Savings from energy demand reduction	11.4	49%
Savings from heat network / CHP	0.0	0%
Savings from renewable energy	7.4	32%
Cumulative onsite savings	**18.8**	**81%**

Emissions within this report are based on the following CO_2 emission rates:

- Natural Gas 0.210 kgCO_2/kWh
- Grid electricity 0.138 kgCO_2/kWh

These represent the SAP 10.2 carbon factor figures.

Section One

1 Introduction

Site Overview

Love Design Studio have been appointed to prepare this energy and sustainability statement for the proposed development at 61 Redington Road, Hampstead, London, NW37RP situated within the jurisdiction of the London Borough of Camden.

The proposal is to convert the three existing residential units into one family dwelling and a one-bedroom flat at the lower ground floor level.

Redington Road is a residential street that runs between West Heath Road and Frognal. This property is very close proximity to the Heath (less than 0.1m) and within reach of Hampstead Village (0.8m) where there is an array of shops, bars, and restaurants as well as excellent transport links to the City & the West End.

The purpose of this statement is to outline the sustainability credentials of the scheme and demonstrate the alignment of the proposed energy strategy with relevant national, regional, and local planning policy requirements.

Figure 2: Site boundary (Red)

National Planning Policy

The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.

Planning law requires that applications for planning permission be determined in accordance with the development plan unless material considerations indicate otherwise. The National Planning Policy Framework must be considered in preparing the development plan and is a material consideration in planning decisions. Planning policies and decisions must also reflect relevant international obligations and statutory requirements.

The purpose of the planning system is to contribute to the achievement of sustainable development. In summary the framework advises:

"Plans should take a proactive approach to mitigating and adapting to climate change, considering the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.

New development should be planned for in ways that:

- *Avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and*
- *Can help to reduce greenhouse gas emissions, such as through its location, orientation, and design. Any local requirements for the sustainability of buildings should reflect the government's policy for national technical standards.*

To help increase the use and supply of renewable and low carbon energy and heat, plans should:

- *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);*
- *Consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and*
- *Identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.*

Regional Planning Policy

London Plan (2021)

Under the legislation establishing the Greater London Authority (GLA), the Mayor is required to publish a Spatial Development Strategy (SDS) and keep it under review. The London Plan, published in 2021, is the overall strategic plan for London which sets out an integrated economic, environmental, and social framework for the development of London over the next 20-25 years.

The document brings together the geographical and locational aspects of the Mayor's other strategies, to ensure consistency with those strategies, including those dealing with transport, environment, economic development, housing, culture, and health inequalities.

The energy strategy of the proposed scheme has followed the energy hierarchy written in the key policy below.

POLICY SI 2 - MINIMISING GREENHOUSE GAS EMISSIONS

Policy SI 2 relates to major developments and requires new development to follow the energy hierarchy below:

1. Be Lean - use less energy and manage demand during operation.
2. Be Clean - exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly.
3. Be Green - maximise opportunities for renewable energy by producing, storing, and using renewable energy on-site.
4. Be Seen - monitor, verify and report on energy performance.

Other policy extracts from the London Plan that are deemed relevant to Energy and/or Sustainability have been set out below for reference:

POLICY D6 - HOUSING QUALITY AND STANDARDS

POLICY G1 - GREEN INFRASTRUCTURE

POLICY G5 - URBAN GREENING

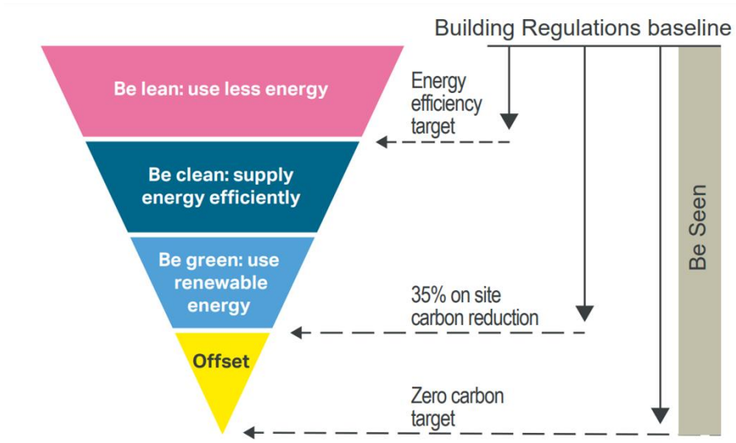
POLICY SI 1 - IMPROVING AIR QUALITY

POLICY SI 3 - ENERGY INFRASTRUCTURE

POLICY SI 4 - MANAGING HEAT RISK

POLICY SI 5 - WATER INFRASTRUCTURE

POLICY SI 7 - REDUCING WASTE AND SUPPORTING THE CIRCULAR ECONOMY



Source: Greater London Authority

Figure 3: The energy hierarchy proposed in the London Plan 2021.

Local Planning Policy

Camden Local Plan 2017

The Camden Local Plan sets out the Council's planning policies and replaces the Core Strategy and Development Policies planning documents (adopted in 2010). It ensures that Camden continues to have robust, effective and up-to-date planning policies that respond to changing circumstances and the borough's unique characteristics and contribute to delivering the Camden Plan and other local priorities. The Local Plan will cover the period from 2016-2031 and includes specific policy regarding '8. Sustainability and climate change'. Key policies have been set out below:

Policy CC1 Climate change mitigation

"The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation:

a. promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;...

...c. ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;

d. support and encourage sensitive energy efficiency improvements to existing buildings;

e. require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and

f. expect all developments to optimise resource efficiency."

Policy CC2 Adapting to climate change

The Council will require development to be resilient to climate change.

All development should adopt appropriate climate change adaptation measures such as:

a. the protection of existing green spaces and promoting new appropriate green infrastructure;
b. not increasing, and wherever possible reducing, surface water run-off through increasing permeable surfaces and use of Sustainable Drainage Systems;
c. incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
d. measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy...

Other Policies to consider are:

Policy CC3 Water and flooding
Policy CC4 Air quality
Policy CC5 Waste

Section Two

2 Energy

Methodology and Assumptions

The scheme looks to meet operational energy targets, in reference to the London Plan energy hierarchy (Policy SI 2 'Minimising Greenhouse Gases'):

1. **Be Lean** - use less energy and manage demand during operation.
2. **Be Clean** - exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly.
3. **Be Green** - maximise opportunities for renewable energy by producing, storing, and using renewable energy on-site.

To achieve compliance Local Policy, and to consider future policy, the following assumptions, definitions, and methodology have been applied:

Domestic

- SAP software has been used to calculate the carbon dioxide emissions for the scheme using SAP 10.2 Carbon Factors.
- The latest version of SAP 10 software version has been used following recent updates that now mean the tool is functional.
- Building fabric will be selected based on the U-values provided by the manufacturer to achieve a high level of building efficiency.
- Renewable technology, for the purpose of the report, includes for the provision of low carbon technologies, including heat-pump technology and PV solar panels.
- Drawings used to model the scheme are based on the drawing set prepared by Ashby Design, received on the 14th April 2023.

Energy Assessment Guidance (June 2022)

Part L 2021 of national building regulations took effect on 15 June 2022. Now that the accompanying Part L software is available and functional, all planning applicants are encouraged to follow the 2022 Energy Assessment guidance and use the 2022 Carbon Emissions Reporting Spreadsheet.

As per Camden Council Planning Guidance the baseline emissions should be based on the "Dwelling Emissions Rate (DER) for the existing dwelling, as well as a Building Regulations Compliant baseline (i.e. inputting the minimum building specification according to Part L1B following application of the usual Part L1B "payback test" methodology)"

The calculation for the Target Emission Rate (TER) is therefore based on the Dwelling Emission Rate (DER) of the existing 61 Redington Road following Part L1 and GLA 2022 Energy Assessment guidance for assuming building fabric, air tightness and HVAC performance.

Be Lean

Passive Design Measures Summary

The table opposite sets out the inputs used for the SAP calculations to generate carbon emission reduction findings.

In summary, the scheme benefits from:

- An orientation that promotes good daylight and sunlight access.
- A well-insulated building fabric, with room for further improvement should low airtightness levels are achieved;
- Low-energy ventilation extract.
- 100% efficient lighting.
- Dual aspect spaces with openable windows to enhance cross-ventilation and mitigate overheating risks.

The Dwelling Fabric Energy Efficiency (DFEE) provides an improvement upon building regulations Part L (2021) standards (see Table 4).

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Table 2: SAP Model inputs

Whole Scheme Technical Information				
Building Fabric	**Existing Upgraded**	**New Elements**	**Unit**	**Comment**
External Wall U-value	0.30	0.14	W/m²K	Include unheated areas
Roof U-value	0.16	0.11	W/m²K	Include roof to terraces
Ground Floor U-value	0.25	0.11	W/m²K	-
Windows U-value	1.4	1.2	W/m²K	-
Doors U-Value	1.4	1.0	W/m²K	-

Technical Information			
Building Fabric	**Input**	**Unit**	**Comment**
Windows g-value	0.4 / 0.7	-	Lower G-Values to South / West facing facades to reduce overheating risk
Frame-Factor	0.7	-	-
Thermal Mass Parameter	Medium (250 kJ/m²K)		Default value
Thermal Bridge Y-value	0.05-0.20	-	Thermal Bridging calculations to be carried out Post-Planning.
Ventilation Method	Natural ventilation		Natural ventilation with intermittent fans
Air permeability	-		Default value. A low air permeability required to incorporate mech vent.

Table 3: Scheme overheating mitigation measures

Overheating Mitigation Measures	
1. Minimising Internal Heat	Pipe lengths minimised, insulated pipework.
2. Reducing heat entering	Balconies, internal blinds, ~100mm window reveals
3. Use of thermal mass	-
4. Passive ventilation	Openable windows, dual aspect where possible
5. Mechanical Ventilation	None
6. Active cooling	None

Be Clean

Heating Infrastructure

Once demand for energy has been minimised, planning applications should demonstrate how their energy systems will exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly to reduce CO_2 emissions.

As well as carbon dioxide emissions, all combustion processes can emit oxides of nitrogen (NO_x) and solid or liquid fuelled appliances (such as those using biomass or biodiesel) can also emit particulate matter. These pollutants contribute to poor air quality and can have negative impacts on the health of residents and occupants of the development. It is important that these impacts are considered in determining the heating strategy of a development.

Existing Networks, Planned Networks and Supplying Heat Beyond the Site Boundary

Where a heat network exists in the vicinity of the proposed development, the applicant should look to prioritise connection and provide evidence of active two-way correspondence with the network operator. Applicants should investigate the potential for connecting the development to an existing heat network system by using the London Heat Map and by contacting the local borough, local heat network operators and nearby developments.

If there is not an existing network, the applicant must investigate whether a network is being planned for the area. Applicants should also investigate opportunities for expanding their heat network to supply heat to local developments and buildings outside the boundaries of their site, particularly if this has the potential to facilitate an area-wide heat network.

The scheme is located at too greater distance from any existing or proposed heat networks.

Therefore, individual efficient space heating and domestic hot water systems are advised.

There are no CO2 savings at this stage of the energy hierarchy.

Be Green

Renewable Energy

Energy assessments should explain how the opportunities for producing, storing, and using renewable energy on-site will be maximised.

The capacity for renewable technologies at the site has been discussed with the wider design team. The following technologies were considered:

- Biomass
- Air Source Heat Pumps (ASHPs)
- Ground Source Heat Pumps (GSHPs)
- Photovoltaic Solar Panels
- Solar Thermal Hot Water
- Wind Technology

Of the above technologies ASHPs were deemed the most appropriate to supply heat, on the grounds of feasibility, viability and scale of whole life energy and carbon savings. Further details on the specification and operation of the ASHP system is given on the page that follows.

A summary of the input details is set out on this page for reference use.

Table 6: Summary of Low Carbon and Renewable measures proposed at the Be Green Stage.

Technical Information		
Domestic Be Green Stage		
Space Heating System	Individual Air Source Heat Pumps	>170% default efficiency, MCS certified
Heating Emitter	Radiators / underfloor	-
Domestic Hot Water System	Same as space heating	-
Storage	Yes	~180 litres, 80mm foam insulation
Space Cooling System	No	-
Low/Zero Carbon Technologies used	Air Source Heat Pumps	>170% default efficiency, MCS certified

Be Green

Air Source Heat Pumps (ASHPs)

Where heat pumps are proposed, a high specification of energy efficiency will be expected to ensure the system operates efficiently and to reduce peak electricity demand. This applies to any type of heat pump proposals including air source heat pumps (ASHPs), ground source heat pumps (GSHPs), water source heat pumps (WSHPs) or hybrid and ambient loop types of systems.

The details of the air source heat pump water heaters will be provided at the detailed design stage; for the purposes of this report, efficiencies within the SAP calculations are based on default efficiency values from the SAP database.

Evidence that the heat pump complies with the minimum performance standards as set out in the Enhanced Capital Allowances (ECA) product criteria are typically required for the relevant The ASHP should look to meet the requirements of the Microgeneration Certification Scheme.

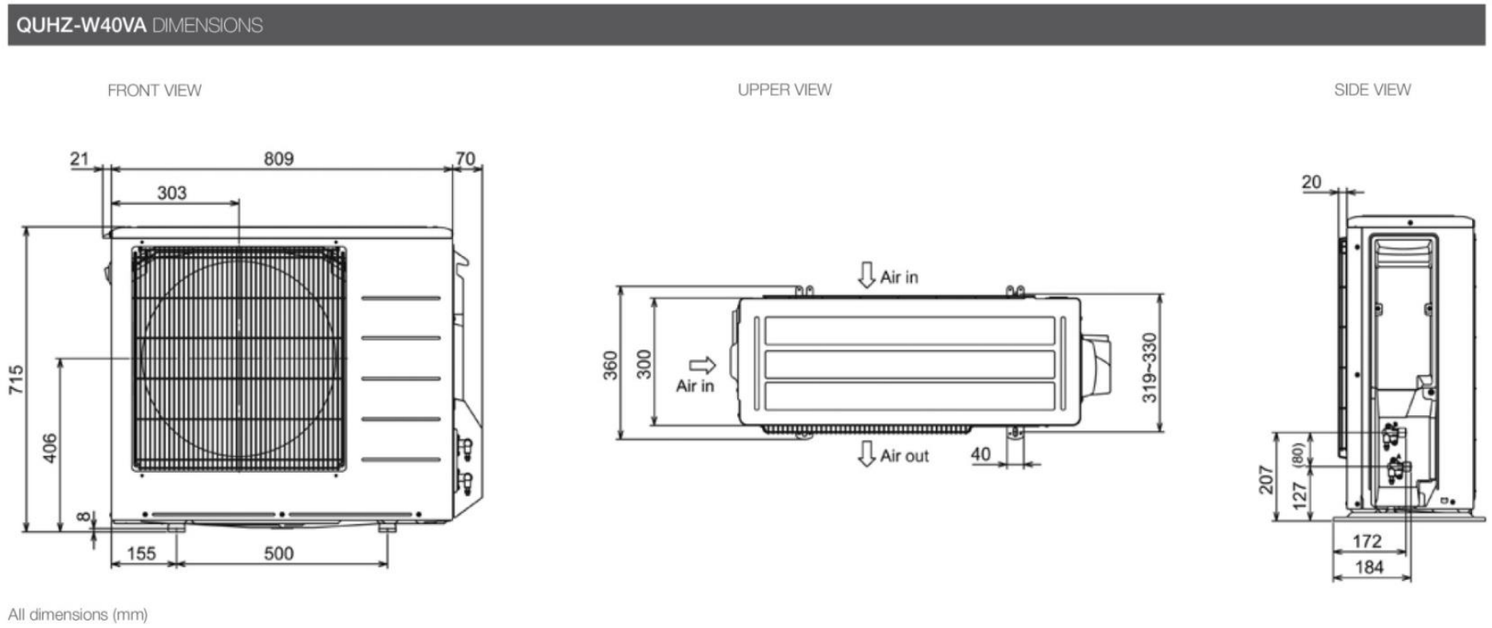


Figure 6: (top-left and top-right) ©Daikin Altherma 3 application in a house and the H Ht outdoor unit model. (Bottom) ©Mitsubishi QUHZ-W40VA example dimensions

Carbon Emission Results Summary

The energy strategy follows the energy hierarchy; reduce energy demand), supply energy efficiently and use renewable and low carbon energy. The overall energy strategy capitalises on passive design measures to maximise the fabric energy efficiency and energy demand.

Following the energy hierarchy process, the applicant has opted for an individual ASHP system per dwelling for space heating and domestic hot water.

Overall. the scheme meets a combined on-site regulated CO2 reduction of 81% (Part L 2021 Baseline).

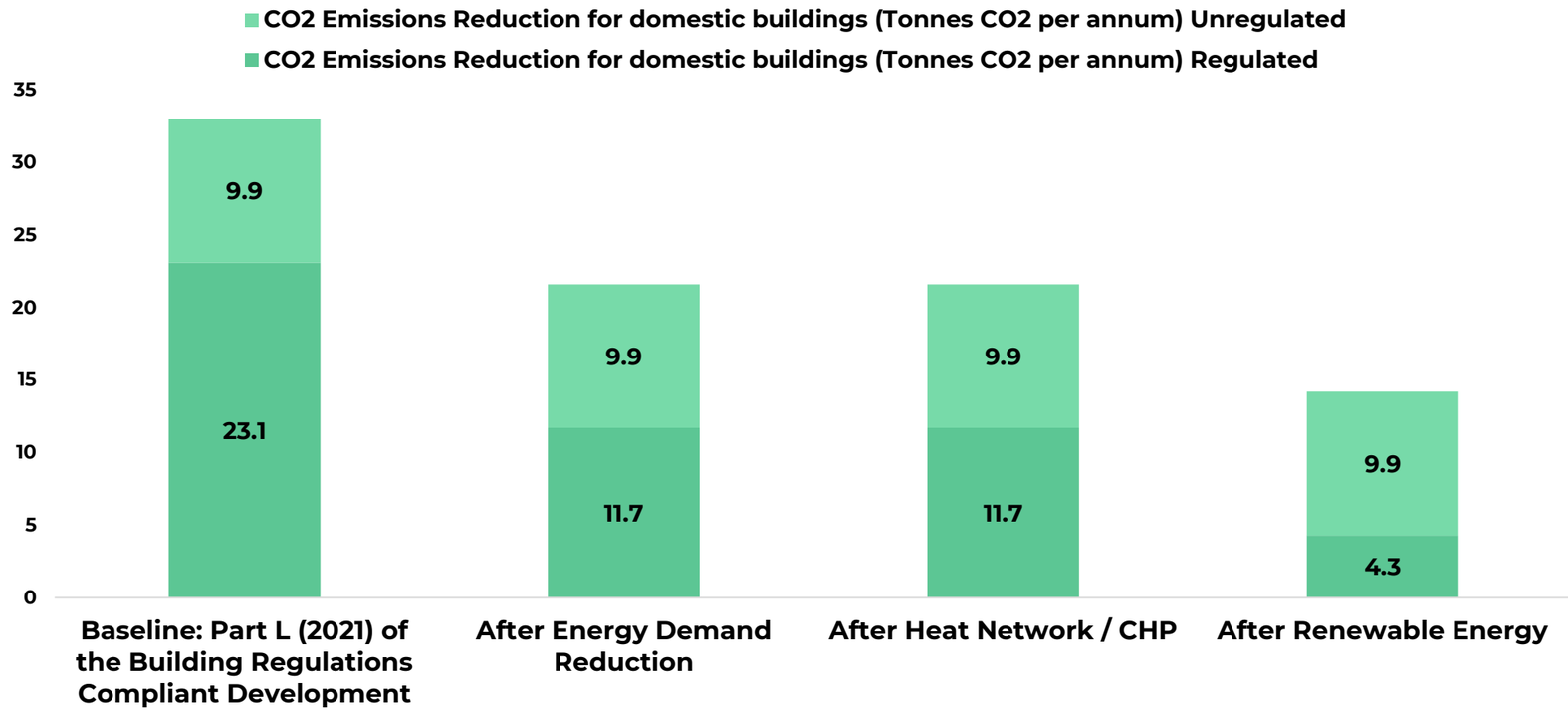


Figure 7: Total site-wide savings at each stage of the energy hierarchy

Table 8: Carbon dioxide emissions after each stage of the Energy Hierarchy for domestic buildings (SAP 10.2)

	Carbon dioxide emissions from domestic buildings (tonnes CO_2 per annum)	
	Regulated	**Unregulated**
Baseline: Part L 2013 of the Building Regulations Compliant Development	20.7	9.9
After energy demand reduction	18.3	9.9
After heat network / CHP	4.3	9.9
After renewable energy	2.9	9.9

Table 9: Total site-wide savings at each stage of the energy hierarchy

	Regulated domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	**(%)**
Savings from energy demand reduction	11.4	49%
Savings from heat network / CHP	0.0	0%
Savings from renewable energy	7.4	32%
Cumulative savings	**18.8**	**81%**

Section Three

3 Sustainability

Sustainability and Climate Change Appraisal

To meet the Local Authority's sustainability requirements, we have set out the sustainability credentials of the scheme in similar format to that of the, now defunct, Code for Sustainable Homes.

In a statement made on 25 March 2015, the Secretary of State for Communities and Local Government, Eric Pickles, confirmed that from 27 March 2015, changes to the 2008 Climate Change Act would mean local authorities in England could no longer require code level 3, 4, 5 or 6 as part of the conditions imposed on planning permissions. Applicants should work towards to the relevant Building Regulations standard; however, energy requirements for dwellings in the UK are now typically set by the Building Regulations equivalent to code level 4.

For the purpose of this assessment, we have used the Code as a method for assessing and demonstrating the residential part of the scheme's sustainability credentials and summarised the scheme's aspirations against each category.

Energy Display Devices

The scheme will be provided with the ability to display energy consumption data and record energy use; this is to promote the specification of equipment to display energy consumption data, thus empowering dwelling occupants to reduce energy use.

Drying Space

To promote a reduced energy means of drying clothes. Space will look to be made available for the ability to dry clothes to avoid utilising heat energy.

Energy Labelled White Goods

Where white goods will be provided, the scheme will look to have them classified as energy efficient with at least an A-rating, where feasible. This is to promote the provision or purchase of energy efficient white goods, thus reducing the CO_2 emissions from appliance use in the dwelling.

External Lighting

All external space lighting, including lighting in common areas, will be provided by dedicated energy efficient fittings with appropriate control systems in-line with Building Regulations standards; this is to promote the provision of energy efficient external lighting, thus reducing CO_2 emissions associated with the dwelling.

Home Office

Either the living spaces or main bedrooms will have space to allow for a desk, chair and filing cabinet or bookshelf to be installed, with space to move around the front and side of the desk; this is to promote working from home by providing occupants with the necessary space and services thus reducing the need to commute.

In all cases, the room will be large enough to allow the intended use of that room, e.g. if a home office is to be set up in the main bedroom, that room also will be able to fit in a double bed and other necessary furnishing.

Sustainability and Climate Change Appraisal

Water and Surface Water Run-Off

Indoor Water Use

The water consumption criteria for the dwellings will be in line with the 110 l/p/day in compliance with Building Regulations. To reduce the consumption of potable water in the home from all sources, including borehole well water, using water efficient fittings, appliances, and water recycling systems.

External Water Use

Space should be made available for the provision of water butts in private amenity spaces; this is to promote the recycling of rainwater and reduce the number of mains potable water used for external water uses.

Management of Surface Water Run-off from Developments

To design surface water drainage for housing developments which avoid, reduce and delay the discharge of rainfall run-off to watercourses and public sewers the scheme will use SuDS techniques; this will protect receiving waters from pollution and minimise the risk of flooding and other environmental damage in watercourses.

Flood Risk

There are no known watercourses within or adjacent to the site. The site is located within Flood Zone 1 on the EA flood map, which indicates a ‘low’ risk of flooding from fluvial and tidal sources. ‘Low’ risk areas have an annual probability of flooding of less than 0.1% (or 1 in 1000 years).

Materials

Environmental Impact of Materials

To specify materials with lower environmental impacts over their life cycle; where feasible, key elements of the building Envelope will achieve an equivalent rating of A+ to D in the 2008 version of The Green Guide:

- Roof
- External walls
- Internal walls (including separating walls)
- Upper and ground floors (including separating floors)
- Windows.

Responsible Sourcing of Materials - Basic Building Elements

To promote the specification of responsibly sourced materials for the basic building elements; materials in the following Building Elements will be responsibly sourced:

a) Frame
b) Ground floor
c) Upper floors (including separating floors)
d) Roof
e) External walls
f) Internal walls (including separating walls)
g) Foundation/substructure (excluding sub-base materials)
h) Staircase

Additionally, timber in these elements will be legally sourced

Responsible Sourcing of Materials - Finishing Elements

To promote the specification of responsibly sourced materials for the finishing elements; materials in the following Finishing Elements will be responsibly sourced:

a) Staircase
b) Windows
c) External & internal doors
d) Skirting
e) Panelling
f) Furniture
g) Fascias
h) Any other significant use

Additionally, timber in these elements will be legally sourced

Sustainability and Climate Change Appraisal

Waste

Storage of Non-recyclable Waste and Recyclable Household Waste

To provide adequate internal and external storage space for non-recyclable waste and recyclable household waste, a recycling scheme operator will be appointed based on the local authority's requirements to maintain bins and collect recyclable waste regularly. Space for recycling containers will:

- be located in an adequate external space
- be sized according to the frequency of collection, based on guidance from the
- recycling scheme operator
- store recyclable waste in identifiably different bins

Construction Site Waste Management

A compliant Site Waste Management Plan (SWMP) will be carried out setting out target benchmarks for waste, procedures for minimising hazardous waste and monitoring/measuring/reporting of hazardous and non-hazardous waste groups; this is to promote resource efficiency via the effective and appropriate management of construction site waste. The Site Waste Management Plan (SWMP) will include procedures to sort and divert waste from landfill, through either.

a) Re-use on site (in situ or for new applications)
b) Re-use on other sites
c) Salvage/reclaim for re-use
d) Return to the supplier via a 'take-back' scheme
e) Recovery and recycling using an approved waste management contractor
f) Compost

according to the defined waste groups (in line with the waste streams generated by the scope of the works).

Composting

Space for individual home composting facilities will be provided to promote the provision of compost facilities to reduce the amount of household waste sent to landfill.

Pollution

Global Warming Potential (GWP) of Insulants

To promote the reduction of emissions of gases with high GWP associated with the manufacture, installation, use and disposal of foamed thermal and acoustic insulating materials; where feasible, insulating materials in the elements of the dwelling listed below will have a low GWP (in manufacture AND installation):

- Roofs: including loft access
- Walls: internal and external including lintels and all acoustic insulation
- Floors: including ground and upper floors
- Hot water cylinder: pipe insulation and other thermal stores
- Cold water storage tanks: where provided
- External doors

NOx Emissions

To promote the reduction of nitrogen oxide (NOX) emissions into the atmosphere; there will be no combustion boilers provided on-site within the dwellings.

Sustainability and Climate Change Appraisal

Health and Wellbeing

Daylight

The Building Research Establishment's publication "Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice" (2022) has been used to assess the daylight access to each habitable room. This is to promote good daylighting, especially in living rooms, thereby improving quality of life and reducing the need for energy to light the home.

Sound Insulation

Building materials will be chosen as such to improve the sound insulation between dwellings and to the main road; in-line with BS8223; this is to promote the provision of improved sound insulation to reduce the likelihood of noise complaints from neighbours.

Private Space

To improve quality of life by promoting the provision of an inclusive outdoor space which is at least partially private outdoor space (private or semi-private) has been provided that is:

- Of a minimum size that allows all occupants to use the space.
- Provided with inclusive access and usability.
- Accessible only to occupants of designated dwellings.

Management

Home User Guide

A Home User Guide will be provided to the owner prior to handover to promote the provision of guidance enabling occupants to understand and operate their home efficiently and make the best use of local facilities.

Considerate Constructors Scheme

There is a commitment to meet best practice under a nationally or locally recognised certification scheme such as the Considerate Constructors Scheme; this is to promote the environmentally and socially considerate, and accountable management of construction sites.

Construction Site Impacts

To promote construction sites managed in a manner that mitigates environmental impacts; where feasible, there will be procedures that will typically cover one or more of the following items:

- Monitor, report and set targets for CO_2 production or energy use arising from site activities
- Monitor and report CO_2 or energy use arising from commercial transport to and from site
- Monitor, report and set targets for water consumption from site activities
- Adopt best practice policies in respect of air (dust) pollution arising from site activities
- Adopt best practice policies in respect of water (ground and surface) pollution occurring on the site

Where feasible, 80% of site timber is reclaimed, re-used or responsibly sourced.

Security

The principles of Secure by Design will be carried out for the scheme, to promote the design of developments where people feel safe and secure-where crime and disorder, or the fear of crime, does not undermine quality of life or community cohesion.

Ecology

To minimise reductions and promote an improvement in ecological value and enhance the ecological value of the site, the scheme will look to promote:

- development on land that already has a limited value to wildlife, and discourage the development of ecologically valuable sites.
- the protection of existing ecological features from damage during the clearing of the site and the completion of construction works.
- the most efficient use of a building's footprint by ensuring that land and material use is optimised across the development.

No overriding constraints to development of the Site have been identified. Recommendations have been provided for ecological enhancement measures that could be delivered as part of the proposed development.

Section Four

4. Conclusion

Conclusion

An assessment of the sustainability and energy credentials has been carried out for the proposed development at 61 Redington Road, Hampstead, London, NW37RP situated within the jurisdiction of the London Borough of Camden.

The proposal is to convert the three existing residential units into one family dwelling and a one-bedroom flat at the lower ground floor level.

The energy strategy follows the energy hierarchy; Use Less Energy (Be Lean), Supply energy efficiently (Be Clean) and use Renewable and low carbon energy (Be Green) as per local policy requirements.

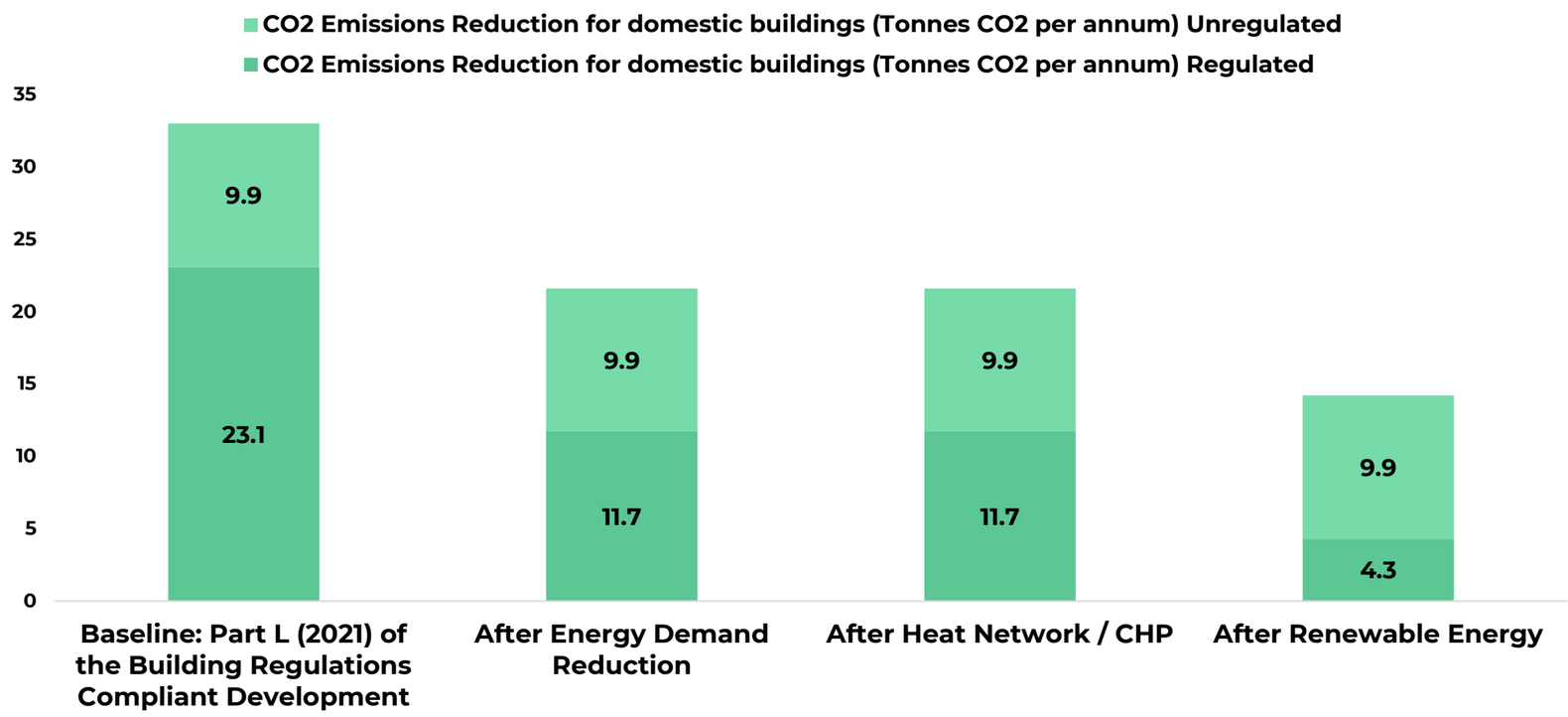
The overall energy strategy capitalises on passive design measures to maximise the fabric energy efficiency and energy demand.

The scheme has adopted a passive design measure first approach prior to adopting active methods and zero-carbon technologies; this is to reduce the demand for active heating and cooling.

The building will be capable of utilising passive opening methods for ventilation purposes; in most cases capitalising on cross-ventilation techniques to dissipate heat in the most efficient manner.

The energy strategy has been set out within this report and the scheme meets an on-site cumulative **CO_2 reduction of 81%.**

The scheme will continue to integrate the core sustainability principles stemming from Local Development Framework within its design, with a focus on maximising the reuse of the building, lowering the embodied carbon associated with the proposal.



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Section Five

5 Appendices

Appendix A - Be Lean Considerations

Demand Reduction

Passive design measures, including optimising orientation and site layout, natural ventilation and lighting, thermal mass and solar shading are set out in this document. Active design measures, including high efficiency lighting and efficient low-energy extract systems, are also set out below.

Building Insulation

Standard insulation materials are typically constructed from petrochemicals and include fibreglass, mineral wool, polystyrene, polyurethane foam, and multi-foils. These materials are typically inexpensive to both buy and install. However, these insulation materials contain many additives, and their process embodied energy is higher than natural insulation. Natural insulation products are typically defined as low impact to nature, generally being organic resources that have low embodied energy. They can be reused and recycled and are usually biodegradable. They tend to be more absorbent than standard man-made insulation materials reducing condensation issues. Thermal conductivity can be defined as the rate at which heat is transferred by conduction through a unit cross-section area of a material; the lower the thermal conductivity of the insulation materials the lower the rate of heat transfer through the wall, roof, or floor. This scheme will provide building insulation U-values improved upon the Building Regulations standard. At the detailed design stage both standard and natural insulation materials will be considered on merit, feasibility, and pricing.

Thermal Mass

Thermal mass is related to materials and the ability to absorb and store heat. High density materials like concrete, bricks and tiles require more energy to heat up; they are therefore considered to have high thermal mass. Lightweight materials such as timber have low thermal mass. For residential uses thermal mass is not commonly deemed to be the most reliable form of controlling heat build-up within spaces as heat may build up during the day in bedrooms during summer and may then be exhausted during the occupants sleeping period; therefore, for the SAP calculations the assumption of the thermal mass parameter is 'medium' (250 kJ/m²K).

Orientation & Site Layout

Orientation of dwellings is key in maximising the benefits of solar gain in the winter and improving daylight & sunlight access given the constraints of the site. Single aspect, south and southwest facing spaces should be minimised unless overheating mitigation measures are present.

Dual aspect facades, where feasible, promote better daylight and sunlight access. Facades also have significant opportunity for daylight and sunlight access to each dwelling.

The dwellings are predominantly north and south facing, allowing for cross ventilation when all doors are open.

Thermal Bridge Summary

Thermal Bridges (Linear) occur at junctions between elements, such as a wall and a floor or a window and a wall. At these locations heat can transfer more easily through the construction, resulting in greater heat loss from the dwelling and localised 'cold spots' in the building envelope. Improving junction details to reduce linear thermal bridging will help achieve Building Regulations compliance and in achieving healthy, low energy homes.

Accredited Construction Details (ACDs) to be implemented in the design and construction of the dwellings. ACD checklists to be completed and signed towards the end of construction.

Thermal junctions complied with are as follows:

- E5 Ground floor (normal)
- E6 Intermediate floor within a dwelling
- E14 Flat Roof
- E16 Corner (normal)
- E18 Party wall between dwellings

Lighting

Poorly lit areas can strain the eyes and increase the reliance of subsidiary lighting such as inefficient unregulated lamps. Health and wellbeing are proven to be linked to access to daylight and sunlight. Furthermore, inefficient lighting can lead to increased energy bills.

Within the property, all fixed light fittings will be low-energy lamps, including storage and infrequently accessed areas. The lux levels within each space will be designed to match relevant Building Regulations and industry guidance to reduce the requirement for additional unregulated lighting.

Appendix A - Be Lean Considerations

Materials

All construction materials will be considered, with particular focus given to minimising embodied carbon through the material's life cycle, from cradle to gate.

Natural Ventilation

Natural ventilation is a method of supplying fresh air to a space through passive means, typically by utilising differences in pressure and/or temperatures within a space.

The key for residential uses is to minimise the complexity of ventilation strategies; otherwise, the occupant may not manage the strategy appropriately. All windows to habitable rooms will be 50-75% openable to allow for maximum dispersion of heat and pollution build-up such as CO_2.

Solar Shading

The scheme will utilise window reveals, balconies, and internal blinds, where feasible, to reduce the requirement for active cooling.

The proposed site also benefits from local shade from existing trees and neighbouring properties, and it is envisioned that the green roofs will also assist with cooling and shade.

The scheme will adhere and comply with the requirements of the newly adopted Part O Building Regulations which governs overheating. In Particular, the scheme will adopt key principles of Table 1.2 (Limiting Solar Gains) and Table 1.4 (Removing Excess Heat) of the approved document.

Lateral hot-water pipework runs will be minimised to avoid heat loss; where there is hot water pipework

Appendix B - SAP Inputs

Item	Comment			
General				
Description	convert the three existing residential units into one family dwelling and a one-bedroom flat at the lower ground floor level.			
Calculation method	Elmhurst Design SAP10 & Approved Document Part L 2021			
Technical Information				
Building Fabric	**Existing Upgraded**	**New Elements**	**Unit**	**Comment**
External Wall U-value	0.30	0.14	W/m²K	
Roof U-value	0.16	0.11	W/m²K	Including roof to terraces
Ground Floor U-value	0.25	0.11	W/m²K	-
Windows U-value	1.4	1.2	W/m²K	Not including frame
Windows g-value	0.4 / 0.7		-	Lower G-Value specified to South and West facing facades.
Window Frame-Factor	0.7		-	-
Thermal Mass Parameter	Medium		TMP	Default value
Thermal Bridging Y-value	0.05		-	Thermal Bridging calculations TBD
Ventilation Method	Natural Ventilation		-	-
System Assumptions				
Air permeability	Default		@50Pa (m³/(h.m²))	-
Be Lean Stage				
Space Heating System	Gas Boiler			89.5% efficiency
Heating Emitter	Radiators			-
Domestic Hot Water System	Same as space heating			-
Storage	Yes			~180 litres, 100mm foam insulation
Space Cooling System	No			-
Be Clean Stage				
Space Heating System	Gas Boiler			89.5% efficiency
Heating Emitter	Radiators			-
Domestic Hot Water System	Same as space heating			-
Storage	Yes			~180 litres, 100mm foam insulation
Space Cooling System	No			-
Be Green Stage				
Space Heating System	ASHPs			170% default efficiency, MCS certified
Heating Emitter	Radiators			
Domestic Hot Water System	ASHP			170% default efficiency, MCS certified.
Storage	Yes			~180 litres, 100mm foam insulation
Space Cooling System	No			-
Low/Zero Carbon Technologies used	ASHPs			170% default efficiency, MCS certified

Appendix C - SAP DER/TER Worksheets

LOVE DESIGN STUD/O

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We help design teams within the built environment create sustainable spaces and buildings.

Our work encompasses all stages of a building’s lifetime; from advising developers on new development to landowners on improving their building stock. Our experience of each RIBA Stage enabling us to better advise on the other.

Environmental consultants, designers, engineers and technicians in the built environment.

Whether it be a single house extension, commercial property, school, or multi-residential masterplan; Love Design Studio will look to maximise the scheme’s sustainability credentials where most value is obtained.