compliant EPC
dynamic energy consultancy

Tel: 01623 573009
Email: info@compliant-epc.co.uk
Website: www.compliant-epc.co.uk
Address: J2, Mill 3, Pleasley Vale Business Centre, Mansfield, Nottingham, NG19 8RL

EPCs • Floor Plans • Legionella Risk Assessments • SAP & SBEM Calculations • Water Efficiency Calculations • Air Pressure Testing

Energy Statement

Project:

Address:

18 No. Apartments at:
7-11 & 13 Woodcote Road
Wallington, London
Energy Statement

REV	DESCRIPTION	DATE
01	Energy Statement	19/11/2019
02	Energy Statement – Revised Layout	12/02/2020

Compliant EPC Ltd
Dynamic Energy Consultancy

1.0 Executive Summary

This energy statement report has been prepared to demonstrate compliance with Part L 2013 for the proposed 18 apartments at 1-2 Ross Parade, Wallington, London, SM6 8QF.

This development incorporates 18 no. apartments which will be created from the conversion of an existing building and as such, fall under Part L1B of the building regulation 2013.

The London Borough of Sutton authority policy states that 'each of the remaining dwellings to be created through residential conversion will comply with Part L1A of the building regulations **as far as possible** by meeting the minimum energy efficiency standards and CO2 emissions targets that would apply to a new dwelling of the same size and orientation'.

The design for this building includes upgrades to the thermal elements which meet or exceed the requirements of Part L1B along with high efficiency gas central heating and hot water to each apartment to provide a carbon efficient design. This assessment reviews the potential to minimise CO2 emissions through application of the mayor's energy hierarchy:

- **Be lean**
- **Be clean**
- **Be green**

In summary it is assessed that each flat will meet compliance with Part L1B 2013 due to the upgrades of the building fabrics and services.

As no district heating network is available in the local area and CHP is not viable given the size and use of the apartments, the clean measures have been discounted.

A review of potential green measurements has been carried out and it has been deemed that PV would be the most appropriate measure for the project although this has not currently been included in the design as this is not required to meet the requirements of the local plan.

2.0 Introduction

This report has been compiled to provide a concept energy strategy which aims to provide figures and an understanding of the potential renewable technologies which could be incorporated within this development to satisfy local planning regulations.

Note: Due to the constraints of the site, Photovoltaic panels have been deemed the most appropriate with all renewable other system types being discounted as not viable.

2.1 Software

Energy benchmarking has been produced using **STROMA FSAP** version **1.0.4.18**.

2.2 Local planning guidance

The London Borough of Sutton Planning authority states that a minimum carbon reduction of **35%** must be obtained and a **10%** carbon reduction from a decentralised or low carbon energy source to achieve overall compliance for the scheme – New build only (not applicable).

A fabric first approach has been considered with a view to reducing the total demand and meeting the planning requirements by considering a solar PV array for the scheme.

From the assessments completed and information provided in this report it is evident that all dwellings are meeting the requirements for the building regulations and the local authority specific requirements.

2.3 Methodology

This report details the following analysis:

a) SAP analysis of each apartment to benchmark the carbon emissions.
b) High level renewable energy analysis of available technologies.
c) Determine best method of carbon reduction.
d) Summarise the most appropriate option.

2.4 Site Details

This project comprises of an existing building which has been converted into 18 no. apartments. Each apartment has a living area, kitchen, bedrooms and bathrooms contained within. The building also has communal access corridors and stairwells.

The conditioned internal floor area for each apartment range is approximately **20-75m².**

Building fabric and passive design measures have been considered as the primary approach to achieve compliance with the L1B regulations.

PV has not currently been included in the design but has been reviewed the assess the requirements in achieve a nominal 10% reduction in carbon emissions.

3.0 London Borough of Sutton Plan

This section summarises the work undertaken that has informed the strategy and building design in accordance with the London plan.

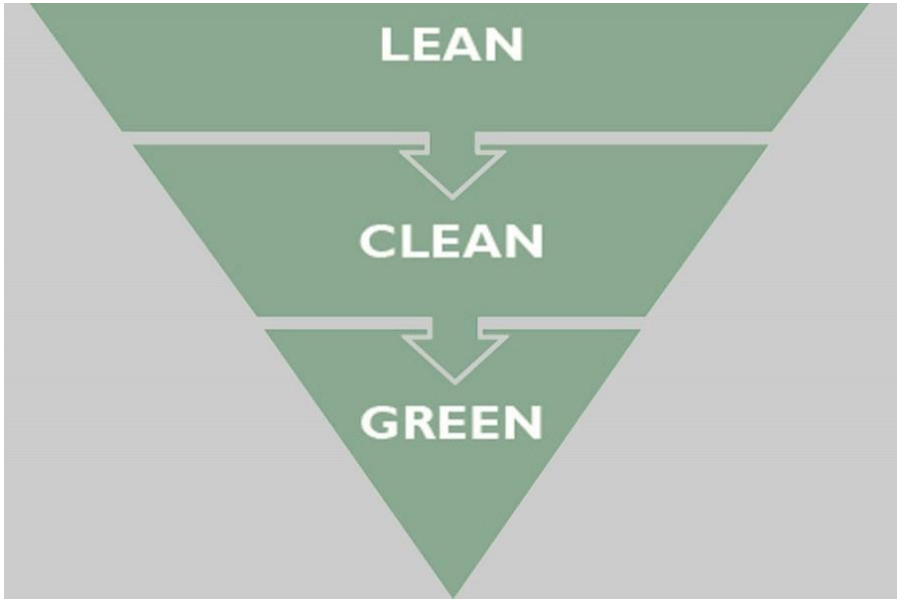
It is understood that the London Borough of Sutton local plan requires a 35% reduction in carbon emissions reduction on the 2013 building regulations for new build dwellings. Dwellings forming part of a conversion are required to comply with Part L1A 2013 as far as possible by meeting the minimum MEES standards and CO2 emissions targets.

This section reviews:

- **Demand Reduction (Be Lean)** to achieve Building Regulations Part L1B 2013 CO2 emissions compliance through active energy efficiency measures alone.
- **Heating Infrastructure including CHP (Be Clean)** review of the potential to connect to existing district heating networks and the feasibility of the inclusion of combined heat and power (CHP).
- **Renewable Energy (Be Green)** consideration of renewable technologies.

The proposed design achieves the following:

- Part L1B 2013 compliant through the inclusion of energy efficient (Be Lean) measures alone.
- Be clean measures are unavailable or deemed not appropriate for the scheme.
- The scheme has the potential for green measures and this has been reviewed.



3.1 Demand Reduction (Be Lean)

The scheme aims to demonstrate that it achieves the Part L1B 2013 compliance from energy efficiency (Be Lean) measures alone.

The following energy efficiency measures have been incorporated within the design in order to achieve Part L compliance. The benefit of these is reflected in the ability of the building to demonstrate Part L1B 2013 compliance without reliance upon LZC technologies.

The building fabrics are as follows:

Building Fabrics (W/m²K)	Achieved U-Value (W/m²K)	Limiting U-value
Floor U-value	0.26-0.28	0.70
External wall U-value	0.18-0.28	0.30
Roof U-value	0.17-0.18	0.18
Roof light U-value	1.6	1.6
Glazing U-value	1.6	1.6
Door U-value	1.8	1.8

Building services strategy:

Building Services
Gas fired central heating system - 89% efficient combi boiler
Intermittent extract fans
100% Low energy lighting

3.2 Passive Design

PASSIVE DESIGN	DETAIL	COMMENT
Orientation	Consider orientation of the building to reduce solar gains in summer and maximise the potential winter solar gains and daylight	Buidling is an existing structure and orientation cannot be changed.
Daylight	Including through dual aspect, optimal window size, higher floor to ceiling heights, shallow floor plates, the use of light wells and roof lights.	Window openings are existing and cannot be changed
Solar Gains	Depending whether heat is required – by altering the size and depth of windows on the north and south elevations. To retain heat, providing a thermal buffer will provide a transition area between entry/exit areas. If heat is not required include shading devices, low g-value glazing.	High performance windows are to be incorporated
Insulation	In non-residential development, the level will vary to limit overheating, depending on solar gain and internal heat gains as well as air tightness. Maximise insulation of heating infrastructure including hot water pipes and hot water storage units.	Included
Cold Bridging	To prevent the loss of heat and to prevent the development of cold spots which can lead to mould.	Included
Thermal Mass	Which can help retain heat, or if exposed, lose heat to the cooler external environment.	Assumed indicative: medium thermal mass due to existign structure
Natural Ventilation	Including through openable windows, shallow floor plates, dual aspect units, passive ventilation with heat recovery, designing in the 'stack effect' system where pressure differences are used to draw air through a building and double façade where the inner façade has openings to release heat without occupants being exposed to external wind and noise.	Openable windows included

3.3 Active Design

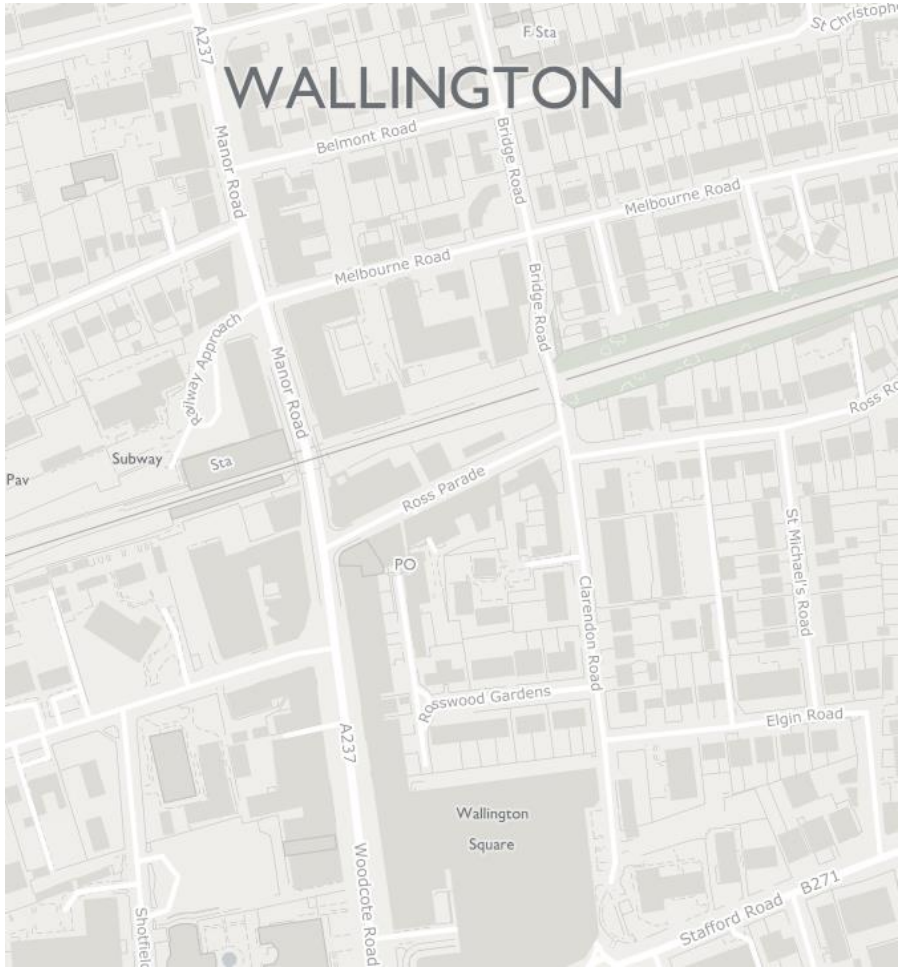
ACTIVE DESIGN	DETAIL	COMMENT
Efficient heating systems	Such as efficient, low temperature heating e.g. underfloor, community heating systems, combined heat and power plants for large schemes	The high performance building fabric and sizing of the centralised gas-fired space heating system will be such that it is able to consistently run in a high efficiency condensing mode.
Heat recovery	Recovery waste energy from heating or process energy to reduce energy consumption	Not applicable for building type
Natural cooling and efficient cooling systems	Openable windows, MVHR systems	Openable windows are the only viable solution for the buidling as it is existing.
Efficient ventilation systems	Including ventilation with heat recovery, which is a growing requirement due to the increased air tightness of buildings. Passive ventilation with heat recovery units, that do not require electricity.	Heat recovery not viable due to buidling type. Intermittent extracts to bathrooms and kitchens only.
Low energy mechanical services	Maximise use of low energy equipment	Domestic hot water (DHW) is to be provided by a fully condensing direct gas-fired system able to achieve a seasonal efficiency of 89%.
Energy efficient lighting	systems, such as using LED lighting.	Lighting energy will be minimised through the use of highly efficient LED luminaires.

3.4 Heating and Cooling Infrastructure (Be Clean)

The European Heat Road map image (below) details the site location for this area (https://maps.london.gov.uk/heatmap). Currently there are no existing district heating schemes within range of the site, and it is not viable for the building.

The adjacent image shows the existing district heating networks which are closest to the site - None.

It is evident that it would be unviable to connect as there are no networks currently available.



The image above shows the current and future potential networks for the area – It is evident that there are no current or future networks available in the area.

3.5 Combined Heat and Power (CHP)

CHP is the use of a heat engine to simultaneously generate both electricity and useful heat. It is one of the most common forms of energy recycling.

Capital costs for CHP systems are higher than for alternative systems, therefore it is important for designers to accurately assess the suitability of each development for the potential inclusion of this technology.

A detailed understanding of the heating and electrical load profiles of daily and annual use is required to correctly size and match systems with actual usage. The assessment of the predicted load profiles can determine whether the CHP will be viable for a development. Assessment of the predicted load profiles can determine whether the CHP will be viable for a development.

As these are domestic flats will relatively small floor areas and standard usage, it is deemed that these would not see the full benefit from this system type.

Therefore at this stage no further CHP feasibility analysis is proposed to be performed as the consensus of opinion is that a standalone CHP installation would be a poor solution in terms of environmental, economic and practical performance.

4.0 LZC Technology (Be green)

The following summary provides a high level assessment of the potential renewable technologies which could be incorporated in the scheme.

Those technologies which are not considered functionally viable are discounted at this stage. Technologies which are suitable for the project are included in the detailed analysis.

LZC Technology	Basic Technical Information	Technical and Planning Issues	Suited Application	Site Specific Comment	Considered for Detailed Assessment	Recommendation			Comments
						High	Medium	Low	
Solar hot water heating	Solar collectors (flat plate or tube) transfer energy into transfer liquid to a closed loop twin coil hot water cylinder.	Ideally located south facing roof.	Domestic and commercial applications with high hot water load; leisure centres, canteens, washrooms.	Sufficient roof space, although fairly low hot water demand, with little demand during the hot summer.	No			✓	Small annual CO_2 saving Modest capital cost Modest payback period
Photovoltaics	Converts sunlight to DC electrical power. Requires inverter to convert to DC.	Consideration given to shading, roof loading, wind sheer, roof access and connection to DNO.	Wide range of building types, schools, offices, hotels, residential. Site with good access to solar radiation.	Roof with potential to site PV array.	Yes		✓		Modest annual CO_2 saving High capital cost Modest payback period
Small scale hydro power, tidal power, wave power	Small scale turbines in fast flowing rivers provide electrical power. Tidal wave platform movement generates energy.	Adequate access to owned fast flowing river source required. Detailed planning approval required for any tidal installation.	Rural and costal situations required.	No access to fast flowing rivers and site located inland.	No			✓	Modest annual CO_2 saving High capital cost Modest payback period
Wind Turbine	Turbine/generator converts wind energy to electrical power. Turbines available with outputs from 600W to 2MW	Best performance in open, non-urban locations. Can be installed on or integrated in a building. Location wind speed is the determining factor	Large sized turbines in non-urban or off-shore locations will be more effective	Generally not suitable in urban/suburban locations.	No			✓	Small annual CO_2 saving High capital cost Modest payback period

LZC Technology	Basic Technical Information	Technical and Planning Issues	Suited Application	Site Specific Comment	Considered for Detailed Assessment	Recommendation			Comments
						High	Medium	Low	
Biomass Heating	Uses plant-derived organic material. Can produce heat or biogas depending on technology	Relatively low efficiency, highly carbon efficient. Issues include; storage area, access, stability of fuel supply, maintenance and air quality	Buildings with sufficient access for storage	Insufficient storage space and access for delivery.	No			✓	High annual CO2 saving High capital cost Long payback period
CHP - natural gas	Generates both electricity and heat using fossil or renewable fuels.	Requires predictable and relatively constant base power and heat loads for best performance approximate 4500 hours running.	Hotels, hospitals, leisure centres, some industrial premises.	Limited Level and duration of DHW demand is not consistent with complexity of CHP system.	No		✓		Modest annual CO_2 saving High capital cost Modest payback period
Community Heating	Utilises waste heat from process such as large scale power generation where the majority of heating comes from waste heat.	Requires access to existing community scheme or creation of scheme to serve a large predictable energy load for viability.	Hotels, hospitals, leisure centres, some industrial premises.	No local district heating is currently available for connection.	No			✓	Modest annual CO_2 saving High capital cost Long payback period
Air source heat pump (elec)	A heat exchanger extracts heat from the air. The heat pump raises the temperature of refrigerant via the compression cycle and reverse for cooling. Used for space heating, hot water and cooling.	Plant space required for external condensers. Noise from condensers to be considered in residential areas.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	Heating required to scheme. Sufficient external space required for condensers. Potential noise concerns in residential area. Limited real-life CO2 emittions reductions Vs. condensing gas-fired boiler.	No		✓		Modest annual CO_2 saving Modest capital cost Long payback period
Air source heat pump (gas)	As electric heat pump using gas as fuel for the compressor. Relatively carbon efficient in comparison with gas fired boiler.	Plant space required for external condensers. Noise from condensers to be considered in residential areas.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	Cooling not required to scheme. Sufficient external space required for condensers. Typical system efficiencies relatively low compared with electric.	No			✓	Modest annual CO2 saving Modest capital cost Long payback period

LZC Technology	Basic Technical Information	Technical and Planning Issues	Suited Application	Site Specific Comment	Considered for Detailed Assessment	Recommendation			Comments
						High	Medium	Low	
Ground source heat pump (elec)	Takes up heat from the ground and releases it at high temperatures. Heat can be used for space heating and domestic hot water.	Requires a large area for horizontal systems, vertical bore holes approx. 5kW required 6m diameter spacing. A licence may be required from the Environment Agency.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	Insufficient external space required for vertical bore holes or ground loop.	No			✓	Modest annual CO_2 saving High capital cost Long payback period
Water source heat pump (elec)	Takes up heat from a local water source, lake or river and releases it at relatively low temperatures. Heat can be used for space heating and domestic hot water.	Requires a large area for water. A licence may be required from the Environment Agency	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating	Insufficient water course on site.	No			✓	Modest annual CO_2 saving High capital cost Long payback period
Geothermal heat pump (elec)	Takes up heat from a local geothermal underground courses. Heat can be used for space heating and domestic hot water.	Requires a access to high temperature geothermal water courses. A licence is required from the Environment Agency for water/energy extraction.	All building types where heating and cooling required. Air to water suited for low temperature systems i.e. underfloor heating.	No local geothermal activity.	No			✓	Modest annual CO_2 saving High capital cost Long payback period
Fuel Cells	Hydrogen fuel cells used to store energy from any renewble technologies.	Requires sufficient base and physical space to make the system viable. Does not provide energy saving but allows storage of energy for long periods to smooth consumption.	All buildings where energy is produced on site.	Insufficient installation/ storage space Relatively low heating requirement.	No			✓	 High capital cost Long payback period

4.1 PV

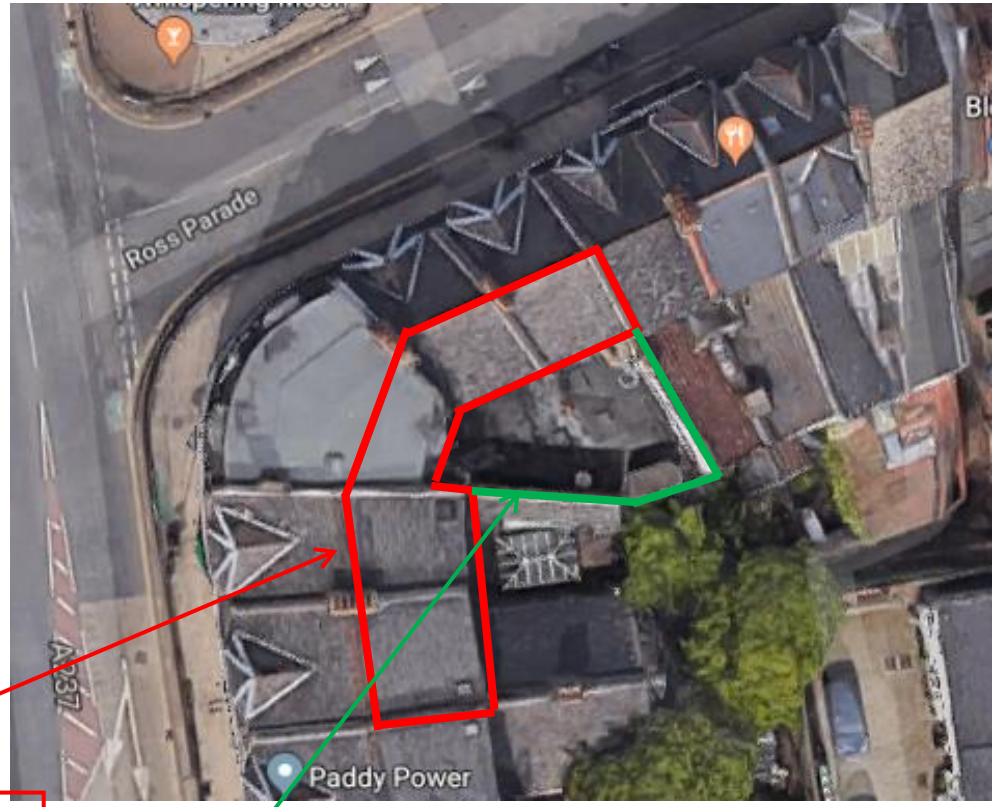
Ross Parade has a pitched roof area which lies on a South / East orientation with little to no overshading and a approximate total area of **100m²** and an area of flat roof which does have an element of overshading with a total approximate area of **70m²** which would make both spaces potentially suitable for housing a PV array.

Note: These areas are appromimate and should be confirmed on site and a PV installer should confirm that that overshading, angle and oritentaiton are appropiate to get optimal performance from an array.

The total usable roof area is approximately **170m²** with less than half of this being sitatuted on an optimal orientation (South) with no overshading issues and can therefore accommodate the proposed PV array of **13 kWp / 85m²**.

As such it is deemed that the proposed array size would be most suited to the space avaliable to still obtain optimal performance from the system.

The section below details the PV requirment to acheieve a 10% energy reduction based upon the calculated figures.



Available area for PV array – Sloped roof

Available area for PV array – Flat roof

Site Overview

4.2 SAP Carbon Benchmark

Based on the building layout and strategy outlined in this report, the following baseline carbon emissions (CO_2) have been calculated for each apartment (excluding additional PV). The columns below show the proposed carbon figures based upon the inclusion of a PV array to meet a minimum 10% CO2 reduction.

The proposed design (DER) allows each apartment to achieve compliance in line with the requirements as set out in the approved document Part L1B without the inclusion of any additional renewable technologies.

The proposed PV array of **6.3 kWp** would give a total carbon emissions (CO_2) reduction for the building of **10.17%.**

Apartment Number	Baseline (CO2/kg.year)	Proposed (CO2/kg.year)	CO2 & reduction	Proposed Renewable Technology	PV Size (kWp)
Flat 1 - 7-11 Woodcote Road	1508.07	1351.20	10.40	PV	0.35
Flat 2 - 7-11 Woodcote Road	2080.83	1923.96	7.54	PV	0.35
Flat 3 - 7-11 Woodcote Road	1434.78	1277.91	10.93	PV	0.35
Flat 4 - 7-11 Woodcote Road	1217.50	1060.63	12.88	PV	0.35
Flat 5 - 7-11 Woodcote Road	1447.59	1290.72	10.84	PV	0.35
Flat 6 - 7-11 Woodcote Road	1389.36	1232.49	11.29	PV	0.35
Flat 7 - 7-11 Woodcote Road	1197.80	1040.93	13.10	PV	0.35
Flat 8 - 7-11 Woodcote Road	1244.87	1088.00	12.60	PV	0.35
Flat 9 - 7-11 Woodcote Road	1397.90	1241.03	11.22	PV	0.35
Flat 10 - 7-11 Woodcote Road	1483.55	1326.68	10.57	PV	0.35
Flat 11 - 7-11 Woodcote Road	1797.50	1640.63	8.73	PV	0.35
Flat 12 - 7-11 Woodcote Road	1441.27	1284.40	10.88	PV	0.35
Flat 13 - 7-11 Woodcote Road	1445.78	1288.91	10.85	PV	0.35
Flat 1 - 13 Woodcote Road	1262.66	1105.79	12.42	PV	0.35
Flat 2 - 13 Woodcote Road	1479.89	1323.02	10.60	PV	0.35
Flat 3 - 13 Woodcote Road	2226.72	2069.85	7.04	PV	0.35
Flat 4 - 13 Woodcote Road	1292.40	1135.53	12.14	PV	0.35
Flat 5 - 13 Woodcote Road	2411.75	2254.88	6.50	PV	0.35
Total CO2 reduction %			**10.17**	Total array (kWp)	**6.3**

5.0 Conclusion

This report has demonstrated a high-level review of the potential renewable technology available for the proposed new development at 1-2 Ross Parade, London, SM6 8QF. Approximate carbon savings have been assessed to provide guidance on the most appropriate method of reducing carbon in line with the local authority guidelines and meeting Part L compliance for building regulations requirements.

This assessment has been carried out in line with the London Borough of Sutton Local Planning authority stating that these dwellings should meet compliance with Part L1A as far as possible which is shown through the proposed specification. As part of the assessment we have also considered the inclusion of a PV array to meet a minimum carbon saving of **10%** through on-site generation of renewable energy this is to be obtained from a decentralised or low carbon energy source.

The report considers the 18 converted (L1B) apartments for the proposed scheme and details how Part L compliance and the planning requirements can be achieved based upon the site constraints and renewable technologies available.

Solar PV and passive design measures have been considered as the most appropriate technology to consider for the scheme.

As a whole the scheme would require approximately **6.3 kWp** of PV with a total size of approximately **40m²** to meet/exceed to achieve a **10%** carbon saving across the scheme.

The benefit from the proposed renewable technology to the individual apartments would be based upon the chosen metering option for the PV array:

There are typically two options for apartments. These options are to either have a single system which demonstrates compliance but does not reflect a reduced SAP rating or cost saving or to have individual systems metered into each apartment which would be reflected in the SAP rating and cost assessments.

The former, offers the lowest cost of compliance, whilst the latter allows the flat owner to benefit directly from the solar generated electricity and also the Feed in Tariff.

Further renewables on site would be unpractical due to site constraints of the building.

Appendix A. Combined SAP Worksheets, Compliance Checklists & PEAs

The following SAP Worksheets, compliance checklists & PEAs have been calculated for each apartment with the baseline specification as detailed in this report (Excluding PV).