



Energy Statement

For

Adamsrow

Project:

1 Norfolk Road, Camden, NW8

July 2015

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1 Energy Statement

1.1 Background to statement

There is a requirement for an Energy Statement to be submitted with planning documents for the following project:

Development of a detached house at 1 Norfolk Road, Camden, London, NW8 6AX.

This energy statement has been prepared, according to the guidelines published by London Borough of Camden.

This statement fulfills all the requirements of Camden Planning Guidance, in particular CPG 2.6, CPG 3.12, CPG 3.2, CPG 3.21, CPG 6.2

This statement also shows compliance with London Plan SPG Para 2.4.3 requirement for a flat CO2 improvement target of 35% beyond Part L 2013.

The related SAP calculations have been carried out by an NHER Registered SAP assessor.

1.2 About this document

This report has been written by Steven Knight of Code Consultancy Services Ltd, who is an NHER registered SAP Assessor.

The brief was provided by Mark Hailey of Adamsrow.

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2 Code for Sustainable Homes – Level 4

This development has been designed to meet the Code for Sustainable Homes (version November 2010) level 4, which means there is a mandatory threshold requirement for both Ene 1: Energy and Carbon Dioxide emissions.

Whilst the Code has now been withdrawn, this has been used as a convenient way to demonstrate compliance with the sustainable development principles.

SAP calculations have been done to satisfy Building regulations Part L1A 2013.

2.1 Ene 1: Energy and Carbon Dioxide emissions

To reach Code Level 4, a 19% improvement in dwelling emission rate (DER) over the target emission rate (TER) is required.

2.2 Ene 2: Fabric Energy Efficiency.

To reach Code Level 4, for a detached house, there is no threshold Fabric Energy Efficiency target. However this development shows very good enhanced fabric performance.

3 Camden Planning Guidance (CPG) requirements

3.1 Policy section 2.6: Energy Statement requirements

- Baseline Energy demand and CO2 emissions
- Reduce Demand for energy
- Supply energy efficiently
- Use renewable energy
- Conclusion

3.2 Policy section 3.20 Minimising CO2 Emissions

This policy section refers to the London Plan requirements.

For developments applying for planning permission between 2013 and 2016, there is a requirement for a 40% reduction in CO2 emissions over the 2010 building regulations. As the latest building regulations are now 2013, the London Plan SPG Para 2.4.3 requirement is for a flat CO2 improvement target of 35% beyond Part L 2013.

A 35% reduction in CO2 emissions is therefore required from the 2013 building regulations.

3.3 Policy section 3.21/2 Building Fabric Standards

Fabric performance minimum required is shown below

Fabric element	Minimum Requirement
External wall - u value	0.20
Roof - u value	0.13
Floor - u value	0.20
Windows - u values	1.50 British Fenestration Rating Council band B or better
Doors - u value	1.00 (solid), 1.50 (glazed)
Air tightness	3.00 (m ³ /h.m ² at 50 Pa)
Proportion of energy efficient lighting	100%
Code for Sustainable Homes	Developments should achieve 50% of the un-weighted credits in the Energy category

4 Baseline Case

The baseline case is based on a standard case SAP as defined in the Code Ene 7, Table Cat 1.2.

This provides the baseline reference for the reductions predicted when the specification is improved.

4.1 Baseline Specification Summary

The baseline specification (see Code for Sustainable Homes Table Cat 1.2 for full specification)

Actual construction as shown on the plans submitted with the planning application
Mains Gas

Boiler (88% efficiency) and radiators

Heating controls: Programmer, room thermostats, TRV's, Boiler interlock

Stored hot water – cylinder 150 litre, insulated with 35mm foam

Primary pipework insulated

4.2 Baseline energy consumption – Regulated and non-regulated

The baseline total energy demand for both regulated and unregulated energy is **74,485.72 kWh/yr.**

4.3 Baseline CO₂ emissions

The baseline Total CO₂ emissions are **20,039.32 kgCO₂/yr.**

4.4 Unregulated energy calculations

The non-regulated energy from appliances has been calculated from the following:

Kg CO₂/year from appliances and cooking. See Ene 1:

$$99.9 \times (\text{TFA} \times \text{N})^{0.4714} - (3.267 \times \text{TFA}) + (32.23 \times \text{N}) + 72.6$$

Where TFA = Total Floor area and N = Number of Occupants

For TFA < 43 m²; N = 1.46

TFA ≥ 43 m²; N = 2.844 × (1 - exp(-0.000391 × TFA²))

The NHER calculator tool was used for this calculation.

The table below shows the calculations, with figures taken from the SAP sheet and NHER calculator.

Baseline Demand	Total Energy Demand (kWh/yr)	Associated Total CO2 emissions (kgCO2/yr)
Hot water	2,800.44	604.89
Space Heating - main 1	47,059.61	10,164.88
Space Heating - 2ndry	6,976.77	132.56
Fixed Electrical	6,260.22	3,249.04
Appliances / Non-- regulated	11,388.68	5,887.95
Other energy consumption	0.00	0.00
TOTAL - Baseline case	74,485.72	20,039.32

This assumes the following SAP input values

External walls: U value = 0.14 W/m²K
Ground Floor: U value = 0.10 W/m²K
Roof: U value = 0.10 W/m²K
Windows double glazed U value = 1.5 W/m²K

100% low energy lights

Air permeability q50 (M³/hour/m²) = 5.0

Other values as per standard case SAP.

5 Proposed Build

The proposed build improves the performance, to achieve at least 35% reduction in CO₂ emissions compared with the Part L1a 2013 regulations. This follows the energy hierarchy in the council's guidelines:

1st Using less energy – via fabric improvements and heat recovery

2nd Supplying energy efficiently – high efficiency systems and appliances

3rd Using renewable energy

The highest priority is given to Number 1 in the energy hierarchy 'Using less energy' as can be seen in the approach to the proposed specification.

5.1 Proposed Specification Summary – Energy Efficiency measures

Fabric enhancement

External walls:	U value = 0.14 W/m ² K
Ground Floor:	U value = 0.10 W/m ² K
Roof:	U value = 0.10 W/m ² K
Windows double glazed	U value = 1.2 W/m ² K

Air permeability q₅₀ (M³/hour/m²) = 3.0

Heating systems

Gas Boilers

Heat recovery Technology

Shower Heat recovery – Waste Water Heat recovery (2no. Units)

Renewable Energy

Solar PV panels will be installed on the roof

The energy hierarchy has been followed with the fabric first being enhanced to the highest practical performance level for this type of dwelling, then all means of heat recovery implemented, then renewables added to the maximum available roof space.

5.2 Predicted Energy Consumption - Regulated and non-regulated

The predicted energy consumption for the house is **58, 676 kWh/yr**. This includes both regulated and non-regulated energy.

5.3 Predicted Total CO₂ emissions

The predicted Total CO₂ emissions are **14,952 kgCO₂/yr**

5.4 Predicted CO₂ emissions reductions

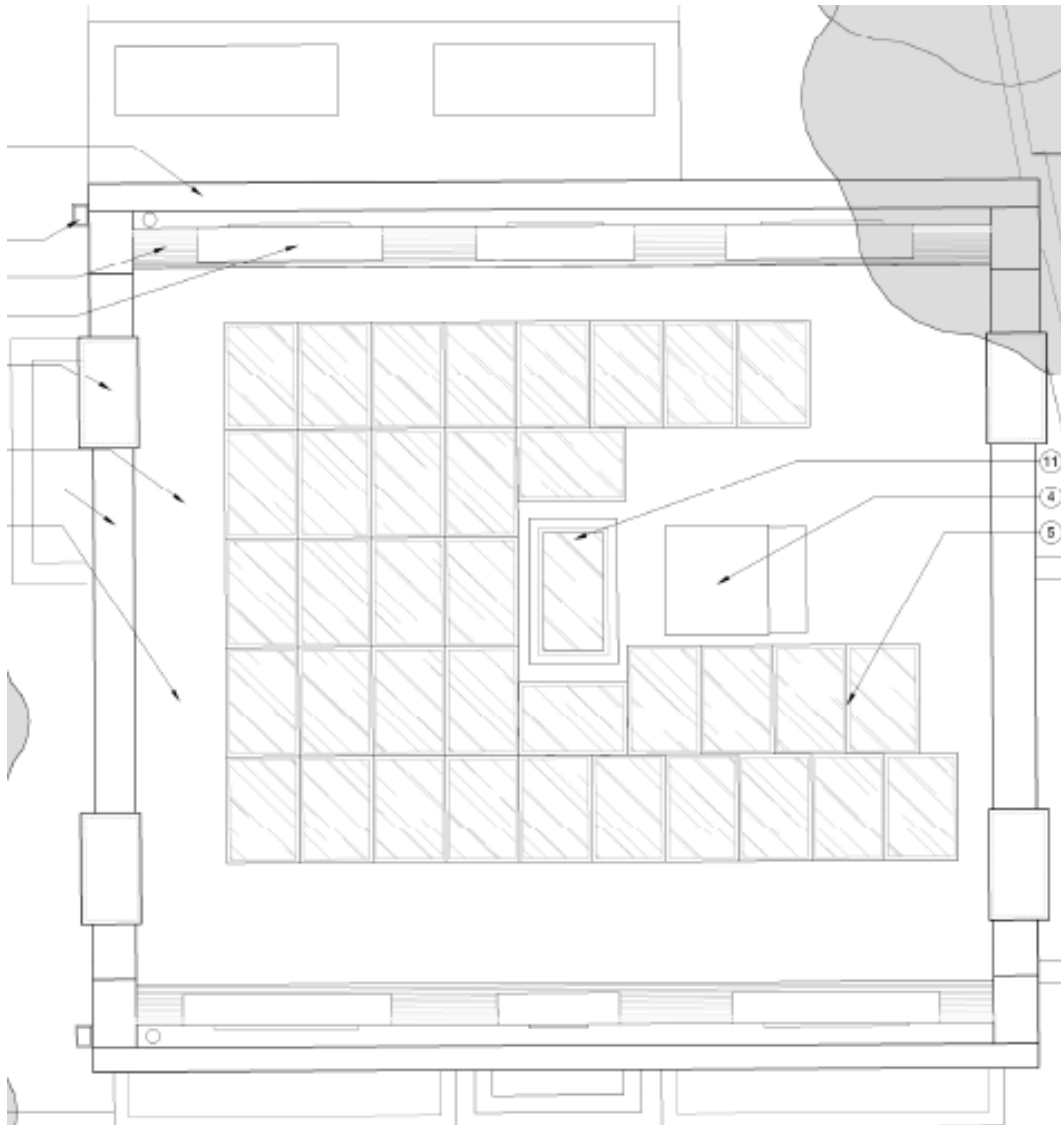
The predicted Total CO₂ emissions reductions below the baseline case are **37.69 %**.

5.5 Renewable Energy – Roof plan

The available roof area for installation of solar PV panels is approximately 95 m².

The roof is flat (very slight pitch), and is South West facing.

The plan below shows the roof area available. (excerpt from Roof Plan- number of panels may vary)



6 Summary Tables - Baseline Energy & CO2 Reductions

6.1 Summary: Baseline energy demand & CO2 Emissions

Baseline Demand	Total Energy Demand (kWh/yr)	Associated Total CO2 emissions (kgCO2/yr)
Hot water	2,800.44	604.89
Space Heating - main 1	47,059.61	10,164.88
Space Heating - 2ndry	6,976.77	132.56
Fixed Electrical	6,260.22	3,249.04
Appliances / Non-- regulated	11,388.68	5,887.95
Other energy consumption	0.00	0.00
TOTAL - Baseline case	74,485.72	20,039.32

The table above shows the baseline energy demand for the house based on compliance with L1A 2013 building regulations.

6.2 Summary: Fabric Enhancements - predicted energy demand & CO2

Fabric enhancements/energy efficiency	Total Energy Demand (kWh/yr)	Associated Total CO2 emissions (kgCO2/yr)
Hot water	2,803.78	605.62
Space Heating - main 1	38,640.87	8,346.43
Space Heating - 2ndry	5,728.66	108.84
Fixed Electrical	6,289.72	3,270.65
Appliances / Non- regulated	11,388.68	5,887.95
Other energy consumption	0.00	0.00
	0.00	
TOTAL – predicted, enhanced fabric	64,851.71	18,219.49

The table above shows the energy demand and associated emissions for the house based on enhanced fabric and improved energy efficiency, exceeding the minimum compliance with L1A 2013 building regulations.

6.3 Summary: Renewables added- predicted energy demand & CO2

Renewables	Total Energy Demand (kWh/yr)	Associated Total CO2 emissions (kgCO2/yr)
Hot water	2,803.78	605.62
Space Heating - main 1	38,640.87	8,346.43
Space Heating - 2ndry	5,728.66	108.84
Fixed Electrical	6,289.72	3,270.65
Appliances / Non- regulated	11,388.68	5,887.95
Other energy consumption		
PV generation	-6,175.12	-3,266.64
Other energy consumption		
TOTAL - predicted for house	58,676.59	14,952.85

The table above shows the energy demand and associated emissions for the house based on enhanced fabric, improved energy efficiency and solar PV panels generating electricity.

A total of 7.5 kWp of solar PV panels are specified.

6.4 Summary of CO2 emissions reductions

Summary of reductions	% DER/TER
1. Baseline emissions	-5.77
2. % DER reduced by enhanced Fabric / energy efficiency	-17.38
3. % DER reduced after adding renewables to (2) - shows >20%	-37.69
% CO2 displaced in total (R)	-37.69
% CO2 displaced by renewable energy	-20.31

The table above shows the progressive reduction in dwelling emission rate due to enhanced fabric, energy efficiency and finally renewable energy.

This shows a total & reduction of over 35% as required for the London Plan and Camden guidelines and shows over 20% CO2 emissions reduced by adding solar PV as required in CPG 6.2, after improving fabric and systems.

7 Conclusion

This statement fulfills all the requirements of Camden Planning Guidance, in particular CPG 2.6, CPG 3.12, CPG 3.2, CPG 3.21, CPG 6.2

A 35% reduction in CO₂ emissions is required from the 2013 building regulations to meet the CPG and this house exceeds this to achieve 37.69 % CO₂ reductions.

The energy hierarchy has been followed with the fabric first being enhanced to the highest practical performance level for this type of dwelling, then heat recovery implemented, then renewables added to the available roof space.

Fabric enhancement

Fabric element	Minimum Requirement	Achieved by proposed design	Complies with CPG?
External wall - u value	0.20	0.14 W/m ² K	Yes ✓
Roof - u value	0.13	0.10 W/m ² K	Yes ✓
Floor - u value	0.20	0.10 W/m ² K	Yes ✓
Windows - u values	1.50 British Fenestration Rating Council band B or better	1.2 W/m ² K	Yes ✓
Doors - u value	1.00 (solid), 1.50 (glazed)	1.0 (solid), 1.2 (glazed) W/m ² K	Yes ✓
Air tightness	3.00 (m ³ /h.m ² at 50 Pa)	3.00 (m ³ /h.m ² at 50 Pa)	Yes ✓
Proportion of energy efficient lighting	100%	100%	Yes ✓

This fabric enhancement, exceeds the minimum required in policy CPG 3.21/2.

Over 50% of the credits are achieved in the energy category of the Code as required.

Air permeability q₅₀ (M³/hour/m²) = 3.0 which meets the required standard.

Heating systems

Gas Boiler, secondary wood burner

Heat recovery Technology

Shower Heat recovery – Waste Water Heat recovery (2no. Units)

Renewable Energy

Solar PV panels will be installed on the roof giving a peak power of 7.5 kwp.

8 Appendices

8.1 SAP Calculations – Baseline, Enhanced, Renewables