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DEVELOPMENT AT LAND OFF DRAYCOTT  
ROAD, BREASTON  
Outline Energy Statement

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**TABLE OF CONTENTS**

1.0 Introduction ..... 3

    1.1 Context ..... 3

    1.2. Description of Development..... 3

    1.3. Project Brief ..... 4

2.0 Methodology..... 5

    2.1 Assessment Methodology ..... 5

3.0 Baseline Energy Demand ..... 5

    3.1 The Development Baseline ..... 5

4.0 CO<sub>2</sub> Reduction Strategy – Fabric, Low Carbon, and Renewable Approach ..... 6

    4.1 Energy Hierarchy..... 6

    4.2 Energy Efficiency Measures ..... 7

    4.3 Proposed Fabric First Specification..... 7

5.0 Low and Zero Carbon (LZC) Technologies ..... 8

    5.1 Potential Technologies ..... 8

    5.2 Air Source Heat Pump (ASHP)..... 9

    5.3 Ground Source Heat Pump (GSHP) ..... 10

    5.4 Biomass Technology ..... 11

    5.5 Solar Hot Water (SHW) Technology..... 12

    5.6 Photovoltaic (PV) Technology..... 13

    5.7 Heat Networks ..... 14

    5.8 Potential Technology Conclusion..... 15

    5.9 Potential Fabric & LZC Results ..... 16

6.0 Water Conservation ..... 17

    6.1 Water Calculator..... 17

7.0 EV Charging ..... 18

    7.1 Part S Electric Vehicle Charging ..... 18

8.0 Overheating ..... 19

    8.1 Part O Overheating Assessments..... 19

9.0 Resource Efficiency ..... 20

    9.1 Household Waste..... 20

    9.2 Construction Waste ..... 20

    9.3 Materials..... 20

10.0 Summary ..... 21

    10.1 Technologies ..... 21

    10.2 Carbon Reduction ..... 21



## Energy & Design

10.3 Water Consumption .....	21
10.4 Electric Vehicle Charging .....	21
10.5 Overheating .....	21
10.6 Part L Compliance .....	21
Appendix A – Carbon Reduction Calculation .....	22

## 1.0 INTRODUCTION

### 1.1 CONTEXT

This document has been produced by Energy & Design Ltd. on behalf of Peveril Homes to support an outline application for a proposed development of up to 100 residential dwellings at land off Draycott Road, Breaston.

Specific details regarding energy and water conservation methods will be determined at a later stage. However, this report assesses the site's suitability and outlines how mitigation strategies can be implemented to ensure compliance with relevant policies.

### 1.2. DESCRIPTION OF DEVELOPMENT

The proposed development on land off Draycott Road, Breaston, will consist of up to 100 residential plots.

The current site location is shown below.



### 1.3. PROJECT BRIEF

This document demonstrates compliance with the following Policies:

Erewash Core Strategy (2014)

#### **3.2 Policy 1: Climate Change**

**1. All development proposals will be expected to mitigate and adapt to climate change, and to comply with national targets on reducing carbon emissions and energy use.**

##### **Sustainable Design and Adaptation**

**2. Relevant development, including refurbishment where it requires planning permission, will be expected to take account of the following:**

**a) how it makes effective use of sustainably sourced resources and materials, minimises waste, and water use. For residential development, planned water use should be no more than 105 litres per person per day;**

**b) how it is located, laid out, sited and designed to withstand the long and short term impacts of climate change, particularly the effect of rising temperatures, sustained periods of high temperatures and periods of intense rain and storms;**

**c) that the building form and its construction allows for adaptation to future changes in climate; and**

**d) that the building form and its construction permits further reduction in the building's carbon footprint, where feasible and viable.**

##### **Reducing Carbon Dioxide Emissions**

**3. Relevant development should demonstrate how carbon dioxide emissions have been minimised in accordance with the following energy hierarchy:**

**a) using less energy through energy efficient building design and construction, including thermal insulation, passive ventilation and cooling;**

**b) utilising energy efficient supplies – including connecting to available heat and power networks; and**

**c) maximising use of renewable and low carbon energy generation systems.**

##### **Decentralised Energy Generation**

**4. The extension of existing or development of new decentralised renewable and low-carbon energy schemes appropriate for the plan area will be promoted and encouraged, including biomass power generation, combined heat and power, and micro generation systems. In line with the energy hierarchy, adjacent new developments will be expected to utilise such energy wherever it is feasible and viable to do so.**

## 2.0 METHODOLOGY

### 2.1 ASSESSMENT METHODOLOGY

Energy & Design Ltd. has modelled sample types using the L12021 (SAP 10) methodology to calculate dwelling emissions.

This process is used to demonstrate compliance.

- Baseline carbon emissions will be determined and presented as Total CO<sub>2</sub> emissions (kgCO<sub>2</sub>/year). SAP employs the Target Emission Rate (TER), defined as the number of kilograms of CO<sub>2</sub> per square meter of total useful floor area per year, to establish the baseline for compliance with Approved Document Part L12021. This value is then multiplied by the total useful floor area to calculate the overall target CO<sub>2</sub> emissions.
- Improved fabric performance and the integration of Low and Zero Carbon (LZC) technologies will be assessed to achieve reductions in CO<sub>2</sub> emissions (kgCO<sub>2</sub>/year). Results are derived from the Dwelling Emission Rate (DER) within the L12021 calculation and subsequently multiplied by the total useful floor area to determine the total site CO<sub>2</sub> emissions.
- A percentage reduction will be calculated by comparing the design emissions against the target emissions.

## 3.0 BASELINE ENERGY DEMAND

### 3.1 THE DEVELOPMENT BASELINE

To assess the effectiveness of the proposed energy strategy, it is necessary first to establish the baseline, which in this context refers to the Target Emission Rate for annual CO<sub>2</sub> emissions.

The sample dwellings, comprising 2-bedroom, 3-bedroom, 4-bedroom and 5-bedroom dwellings, have been assessed using SAP L12021. The following table details both the maximum allowable CO<sub>2</sub> emissions and the baseline emission values necessary for compliance with L12021 requirements.

This calculation is derived from a maximum of 100 plots designated for development on the site. We have assumed allocation of plots for each house type as follows:

- 2 Bed house type: 30 plots
- 3 Bed house type: 30 plots
- 4 Bed house type: 25 plots
- 5 Bed house type: 15 plots

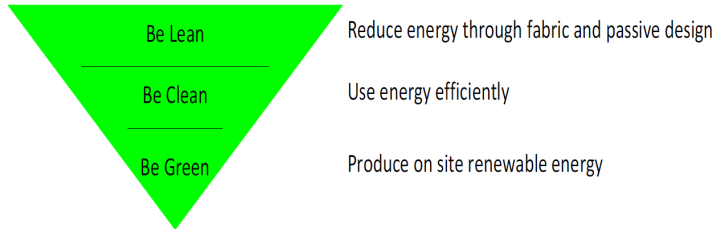
**The above is just an example and will change.**

Achieving compliance with L12021 reflects a 31% enhancement in performance over the requirements set by the L1a2013 building regulations.

Target Emission Rate: Compliant with AD L 2021	
Total CO <sub>2</sub> emissions – kgCO <sub>2</sub> /year	104,303

## 4.0 CO<sub>2</sub> REDUCTION STRATEGY – FABRIC, LOW CARBON, AND RENEWABLE APPROACH

### 4.1 ENERGY HIERARCHY



The proposed dwellings are designed in accordance with the energy hierarchy, prioritising the reduction of energy demand through passive design strategies and a fabric-first methodology prior to the incorporation of low-carbon technologies and on-site renewable energy generation.

## 4.2 ENERGY EFFICIENCY MEASURES

The proposed design should aim to decrease thermal energy demand by enhancing insulation standards, minimising air leakage, and optimising fabric u-values, all in compliance with current Building Regulations.

The following is an example of strategies which could be used to reduce energy consumption and carbon emissions and could be incorporated into the design of the new residences:

- Design new homes to optimise natural daylight in all the habitable spaces with suitable window sizes relative to living rooms and bedrooms.
- Design and layout to promote passive solar gains and maximise natural daylight, sunlight, and ventilation.
- Development which balances minimising the direct adverse impact of shading from other buildings and landscape features and improving access to passive solar gains.
- High-performance glazing with appropriate window u-values and g-values to reduce heat loss and optimise positive solar gain while reducing the potential for overheating.
- 100% low-energy lighting.
- Smart meters
- Bespoke individual PSI values - these have been calculated and used; this assists in Fabric Energy Efficiency by designing out the cold bridges, which may occur if using the Approved details.
- TMP—The TMP (Thermal Mass Perimeter) has been calculated rather than using default figures as now required by L12021; this gives a more accurate reflection of the actual as-built dwelling, closing the gap between design and as-built performance.

## 4.3 PROPOSED FABRIC FIRST SPECIFICATION

The following shows two methods of complying with L 12021, the Notional and an example alternative specification. An alternative specification may be used to comply; this will be provided at the Reserved Matters stage.

Element	Limiting Average Values - Part L12021	Example Alternative Average Values to Comply
Ground Floor U-Value (W/m <sup>2</sup> K)	0.18	0.12
External Wall U-Value (W/m <sup>2</sup> K)	0.26	0.20
Party Wall U-Value (W/m <sup>2</sup> K)	0.20	0.00 (fully filled & sealed)
Roof - Insulated at ceiling U-Value (W/m <sup>2</sup> K)	0.16	0.11
Window U-Value (W/m <sup>2</sup> K)	1.60	1.30
Door U-Value (W/m <sup>2</sup> K)	1.60	1.30
Design Air Permeability m <sup>3</sup> /h.m <sup>2</sup> at 50 Pa	8.00	5.00



## 5.0 LOW AND ZERO CARBON (LZC) TECHNOLOGIES

### 5.1 POTENTIAL TECHNOLOGIES

The following technologies will be assessed for appropriateness in the development.

- Air Source Heat Pumps (ASHP)
- Ground Source Heat Pumps (GSHP)
- Biomass Technology
- Solar Hot Water (SHW) Technology
- Photovoltaic (PV) Technology
- Heat Network

## 5.2 AIR SOURCE HEAT PUMP (ASHP)

ASHP technology extracts heat from the external air and condenses 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 be used for space heating and domestic hot water.

### Advantages

- Mature technology
- Can assist in cooling.
- Approx. 250% efficient using electricity.

### Disadvantages

- Hot water cylinder required.
- Either oversized radiators or underfloor heating is required
- Currently, the running costs are high compared to a gas system.
- Can be noisy.

### Conclusion

ASHP has been deemed suitable for this development.

### 5.3 GROUND SOURCE HEAT PUMP (GSHP)

GSHP technology exploits seasonal temperature differences between the ground and air. Fluid is pumped through pipes laid in the ground, taking up heat extracted by the heat pump and released at a higher temperature to drive a space heating system. The pipework is placed either horizontally or vertically in the ground.

#### Advantages

- More efficient than ASHP
- Mature technology
- Can assist in cooling.
- Approx. 320% efficient using electricity.

#### Disadvantages

- Costly to install.
- Hot water cylinder required.
- Either oversized radiators or underfloor heating is required
- Currently, the running costs are high compared to a gas system.
- Can be noisy.

#### Conclusion

GSHP has been deemed suitable for this development.

## 5.4 BIOMASS TECHNOLOGY

Biomass boilers work on the principle that the combustion of wood chips or pellets can create heat for space heating and hot water.

### Advantages

- Considerable reduction in CO<sub>2</sub> emissions

### Disadvantages

- Can be costly to run compared to a gas boiler.
- Space for a plant room to store fuel and plant.
- Regular maintenance may be required.
- A local source of fuel (reduce transport emissions)

### Conclusion

Due to the cost and the requirement of space for plant and fuel storage, Biomass has been deemed **unsuitable** for this development.

## 5.5 SOLAR HOT WATER (SHW) TECHNOLOGY

Solar thermal technology harnesses solar energy to generate heated water.

### Advantages

- Mature Technology
- Approx. 50% of hot water demand can be met.
- Low maintenance

### Disadvantages

- Not always aesthetically pleasing.
- The benefit of installation is limited to the water heating demand.
- A Large hot water cylinder is required.
- If the system is oversized can contribute to overheating
- Access for maintenance
- Not as many installers as previously
- Benefits not as good as similar technologies.

### Conclusion

Due to the number of disadvantages SHW has been deemed **unsuitable for this development.**

## 5.6 PHOTOVOLTAIC (PV) TECHNOLOGY

Photovoltaic (PV) technology involves converting the sun's energy into electricity.

### Advantages

- Mature Technology
- Low maintenance
- Easily integrated.

### Disadvantages

- Not always aesthetically pleasing.
- Poor design can lead to lower-than-expected yields.
- Access for maintenance

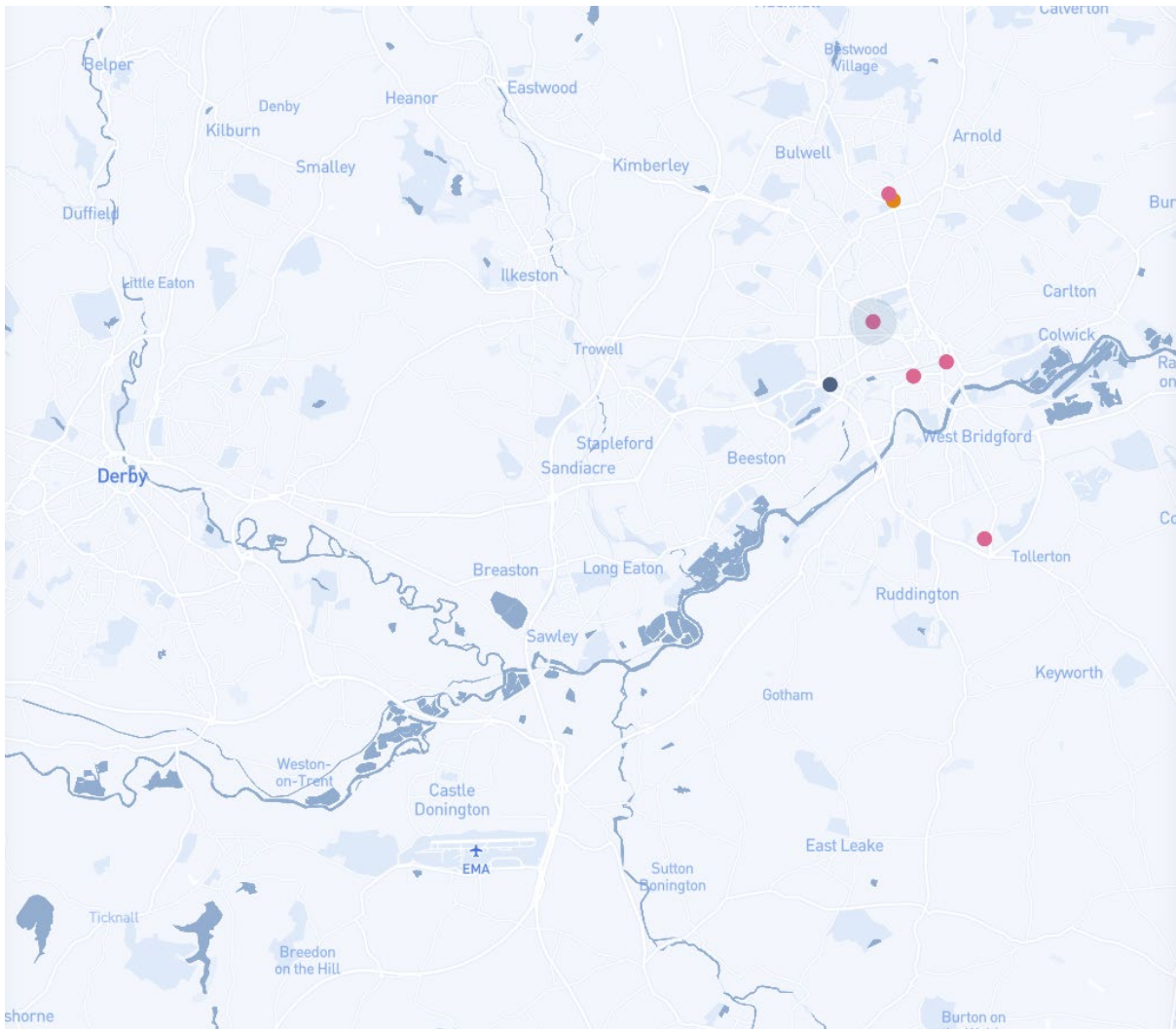
### Conclusion

Due to the benefits of this technology, PV has been deemed suitable for this development.

## 5.7 HEAT NETWORKS

Based on the government's heat network map, which can be found at [https://data.barbour-abi.com/smart-map/repd/desnz/?type=heat\\_network](https://data.barbour-abi.com/smart-map/repd/desnz/?type=heat_network)

This indicates that there are no Heat networks in the local area. The closest one is approximately 9 Miles away and is awaiting construction.



### Conclusion

Due to the absence of heat networks in the local area, they have been deemed **unsuitable** for this development.

## 5.8 POTENTIAL TECHNOLOGY CONCLUSION

The following technologies have been deemed suitable for this development.

- Air Source Heat Pump (ASHP)
- Ground Source Heat Pump (GSHP)
- Photovoltaic (PV) Technology

As this is an outline application, the above technologies could be used; however, further details of the chosen technologies will be provided at the Reserved Matters stage.

## 5.9 POTENTIAL FABRIC & LZC RESULTS

Potentially Air Source Heat Pumps (ASHP) or Photovoltaic (PV) systems could be used at this development, to achieve emissions reductions that surpass the requirements of L12021 regulations.

Target & Design Emission Rate: Compliant with AD L 2021		
Target Total CO <sub>2</sub> emissions – kgCO <sub>2</sub> /year	104,303	
Design Total CO <sub>2</sub> emissions – kgCO <sub>2</sub> /year	39,741	
<b>Total achieved reduction - kgCO<sub>2</sub>/year</b>	<b>64,562</b>	<b>61.90%</b>

**This is based on an assumed house type mix, fabric specification and technology; exact details will be confirmed at the Reserved Matter stage.**

## 6.0 WATER CONSERVATION


### 6.1 WATER CALCULATOR

Policy 1: Climate Change 2.a requires the following.

**a) how it makes effective use of sustainably sourced resources and materials, minimises waste, and water use. For residential development, planned water use should be no more than 105 litres per person per day;**

As per the policy, the water consumption will be under 105 Litres per person per day, utilising low-water-use fixtures (baths, cisterns, showers, taps) or water restrictors.

An example of capacities/flow rates to achieve under 105 Litres per person per day is below.



Job no: **07/11/2025**

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Development name:

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**PRINTING:** before printing please make sure that in "Page Setup" you have selected the page to be as "Landscape" and that the Scale has been set up to 70% (maximum)

WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALCULATOR)																					
House Type:		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10	
Description:		SAMPLE																			
Installation Type	Unit of measure	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day	Capacit yf flow rate	Litres/ person/ day
Is a dual or single flush WC specified?		Dual		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Click to Select		Click to Select		Click to Select	
WC	Full flush volume	4	5.84		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Part flush volume	2.6	7.70		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Taps (excluding kitchen and taps)	Flow rate (litres / minute)	4	7.90		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Are both a Bath & Shower specified?		Bath & Shower		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:
Bath	Capacity to overflow	170	16.70		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Shower	Flow rate (litres / minute)	8	34.96		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Kitchen sink	Flow rate (litres / minute)	6	13.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a washing machine been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Washing Machine	Litres / kg		17.16		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Has a dishwasher been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:
Dishwasher	Litres / place setting		4.50		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a waste disposal unit been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Water Softener	Litres / person / day		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Calculated Use		103.8		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Normalisation factor		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91	
Code for Sustainable Homes	Total Consumption	99.9		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	Mandatory level	Level 3/4		-		-		-		-		-		-		-		-		-	
Building Regulations 17.K	External use	5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0	
	Total Consumption	104.9		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
17.K Compliance?		Yes		-		-		-		-		-		-		-		-		-	

For reference, the Part G building regulations stipulate 125 Litres per person per day.

This would comply with policy 1: Climate Change 2.a



## 7.0 EV CHARGING

### 7.1 PART S ELECTRIC VEHICLE CHARGING

In line with building regulations, Electric Vehicle Chargers will be installed as per the approved document S 2021.

## 8.0 OVERHEATING

### 8.1 PART O OVERHEATING ASSESSMENTS

In line with building regulations Part O 2021, all dwellings should be assessed for overheating using one of the following two methods.

- Simplified method as per guidance O1 section 1, If the simplified method fails then.
- The Dynamic thermal modelling methodology will be used which is based on the CIBSE's TM59 as per O1 Section 2

## 9.0 RESOURCE EFFICIENCY

This site has been developed in accordance with established policies, ensuring that all new projects are designed for optimal resource efficiency throughout both the construction phase and operational lifecycle.

### 9.1 HOUSEHOLD WASTE

Erewash Borough Council offers household collection services for general waste, garden waste, and recyclables, including cans, paper, plastic bottles, cardboard, and glass. Residents receive an information pack outlining collection details and local recycling points.

### 9.2 CONSTRUCTION WASTE

Site Waste will have best practice target benchmarks for resource efficiency. Where possible, materials will be diverted from landfill using various methods.

Site Waste will work to best practice target benchmarks to promote resource efficiency. Whenever feasible, materials will be redirected from landfill through a range of sustainable methods.

### 9.3 MATERIALS

Material choices will be made to mitigate impacts on the environment, including but not limited to the following:

- Have a Global Warming Potential (GWP) of < 5 in manufacture and installation.
- Obtain certification where possible to confirm it is responsibly sourced.
- Materials will be preferred with a low environmental impact as per the BRE Green Guide
- Design Buildings where possible to use less energy and reduce resources.

## 10.0 SUMMARY

### 10.1 TECHNOLOGIES

**Air Source Heat Pump (ASHP) or photovoltaic (PV)** systems could be installed on plots.

**Details of the chosen technologies will be provided at the Reserved Matters stage**

### 10.2 CARBON REDUCTION

Using fabric improvements, Air Source Heat Pumps (ASHP) or Photovoltaic (PV) systems, the site is projected to achieve an average **61.90% reduction in carbon emissions** (kgCO<sub>2</sub>/year) compared to L12021 targets.

**Details of the actual reduction achieved will be provided at the Reserved Matters stage**

### 10.3 WATER CONSUMPTION

The **water consumption** will be under **105 Litres per person per day**, utilising low-water-use fixtures and water restrictors.

**Further details will be provided at the Reserved Matters stage.**

### 10.4 ELECTRIC VEHICLE CHARGING

**Electric Vehicle Chargers** will be installed to comply **with the approved document S 2021**

**Further details will be provided at the Reserved Matters stage.**

### 10.5 OVERHEATING

All dwellings should be assessed for **overheating** using either the Part O 2021 **simplified method or the TM59 Part O dynamic modelling** approach.

**Further details will be provided at the Reserved Matters stage.**

### 10.6 PART L COMPLIANCE

The development will utilise a mixture of the above measures to meet the current Part L / 'future homes' requirements. A plot type SAP / HEM assessment will define this.



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APPENDIX A – CARBON REDUCTION CALCULATION

Dwelling Type	kg CO <sub>2</sub> /year per Type	number of Plots	kg CO <sub>2</sub> /year whole site		Assumed Technology	kg CO <sub>2</sub> /year per plot	Number of Plots	kg CO <sub>2</sub> /year whole site	kg CO <sub>2</sub> /year
	L12021 Target #	Per Type	L12021 Target #			L12021 Design ##	Per Type	L12021 Design ##	% Reduction
2 Bed	783	30	23486		PV	351	30	10538	-55.13%
3 Bed	915	30	27449		ASHP	413	30	12383	-54.89%
4 Bed	1152	25	28792		ASHP	370	25	9248	-67.88%
5 Bed	1638	15	24577		ASHP	505	15	7573	-69.19%
<b>Total</b>		<b>100</b>	<b>104303</b>				<b>100</b>	<b>39741</b>	<b>-61.90%</b>

# based on L12021 TER

## based on L12021 DER

