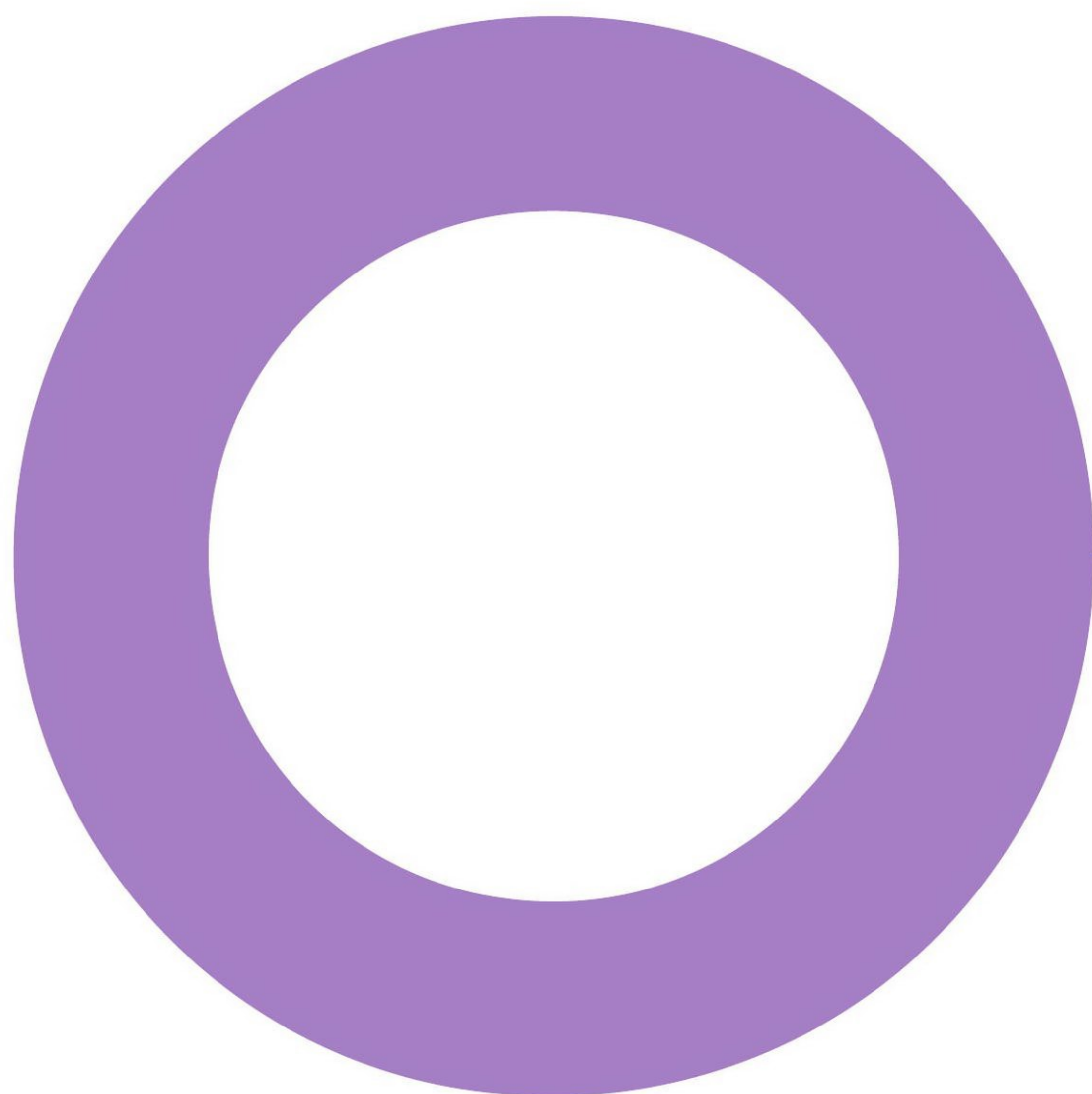


**Clarendon Centre.  
Oxford.**  
**Clarendon LP GP Limited.**

**SUSTAINABILITY**  
ENERGY STATEMENT

REVISION 02 – 18 DECEMBER 2020





Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	26/11/2020	Draft Planning Issue – For comment	R. Garcia	C. Pottage	C. Pottage
02	18/12/2020	Planning issue	R. Garcia	L. Wille	L. Wille

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## Executive summary

This report has been produced in support of the planning application of the redevelopment of the Clarendon Centre located in the centre of Oxford, hereafter referred to as the Proposed Development.

### The proposed development

The existing Clarendon Centre is a shopping centre located in the centre of Oxford, delimited by Cornmarket Street to the east, Queen Street to the south, Shoe Lane to the west and Frewin Court to the north.

The proposed development is divided into three phases:

Phase 1 includes new build laboratory building, with the structure on the north end of the building proposed to be retained, and retail space on the ground and first floors on the Queen Street side.

Phase 2 includes the refurbishment of the office building facing Cornmarket Street (Clarendon House), a student accommodation building with retained structure and new building fabric, and retail units on the ground floor.

Phase 3 comprises a new office building with retail units on the ground floor.

### The energy strategy

The scheme is aiming to achieve a minimum 40% reduction in regulated CO<sub>2</sub> emissions compared to a Part L 2013 baseline through a combination of passive design and energy efficiency measures, and low or zero carbon technologies in line with the Council's new Local Plan. In particular, this strategy proposes passive and energy efficiency measures, air source heat pumps and PV panels, and the buildings will have an all-electric servicing strategy, with gas only provided for the specialist kitchens. The aim is to achieve the 40% reduction target for each of the 3 phases independently.

The electricity grid has experienced a dramatic reduction in carbon intensity since 2013, when the latest version of Part L was released. To reflect this, and as a precursor to the carbon factors that will likely be included in the next update of the Building Regulations, the BRE in 2018 published the Draft SAP 10.0 carbon factors. A further update of these carbon factors was released by the BRE in October 2019 (SAP 10.1), bringing the carbon factor of electricity more in line with what is expected to be achieved in reality over the coming years. In line with this, SAP 10.1 carbon factors are proposed to be used in the energy strategy calculations to demonstrate compliance with planning targets.

The Part L modelling results show that;

- With the proposed passive and energy efficiency measures, and the use of Air Source Heat Pumps (ASHP)/Variable Refrigerant Flow (VRF) systems for space heating and cooling, as well as domestic hot water in the lab and student accommodation spaces (as described in Table 3 in Section 7), the following carbon emission reductions are expected to be achieved based on SAP10.1 carbon factors:
  - a) Phase 1 is expected to achieve a 44.7% reduction in regulated carbon emissions compared to a Part L compliant baseline.
  - b) Phase 2 is expected to achieve a 62.4% reduction in regulated carbon emissions compared to a Part L compliant baseline.
  - c) Phase 3 is expected to achieve a 43.4% reduction in regulated carbon emissions compared to a Part L compliant baseline.
- With the aforementioned heat pump solution, and a 55m<sup>2</sup>, 85m<sup>2</sup> and 44m<sup>2</sup> PV arrays on the roof of Phase 1, Phase 2 and Phase 3 respectively, the following carbon emission reductions are expected to be achieved based on SAP10.1 carbon factors:
  - a) Phase 1 is expected to achieve a 46.3% reduction in regulated carbon emissions compared to a Part L compliant baseline.
  - b) Phase 2 is expected to achieve a 63.2% reduction in regulated carbon emissions compared to a Part L compliant baseline.

- c) Phase 3 is expected to achieve a 44.7% reduction in regulated carbon emissions compared to a Part L compliant baseline.
- The PV array allocations have been based on the availability of suitable roof area for each phase.
- The proposed electric solution is expected to provide further carbon savings compared to the baseline in the future as the electricity grid further decarbonises.

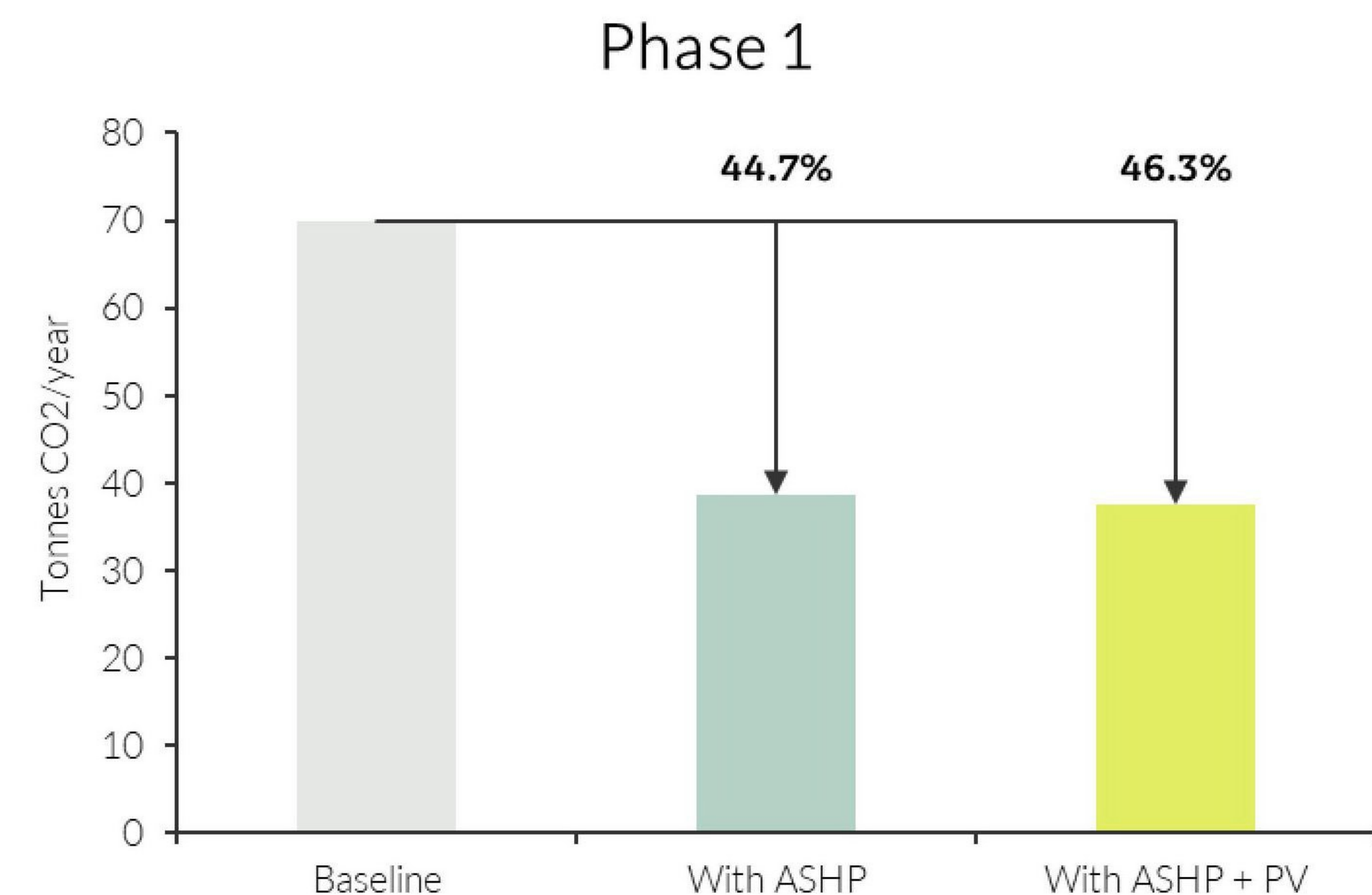


Figure 1: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – Phase 1.

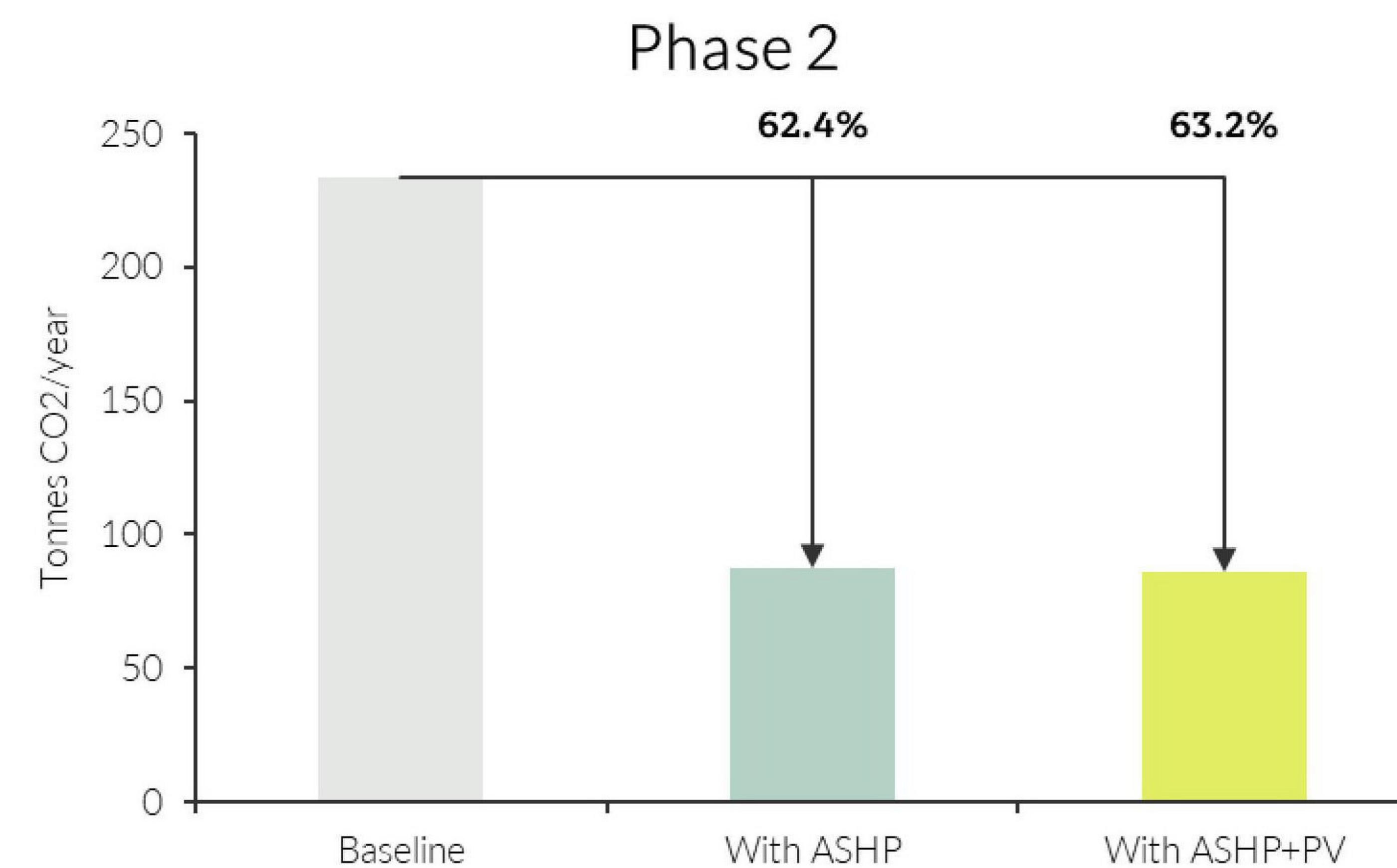


Figure 2: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – Phase 2.



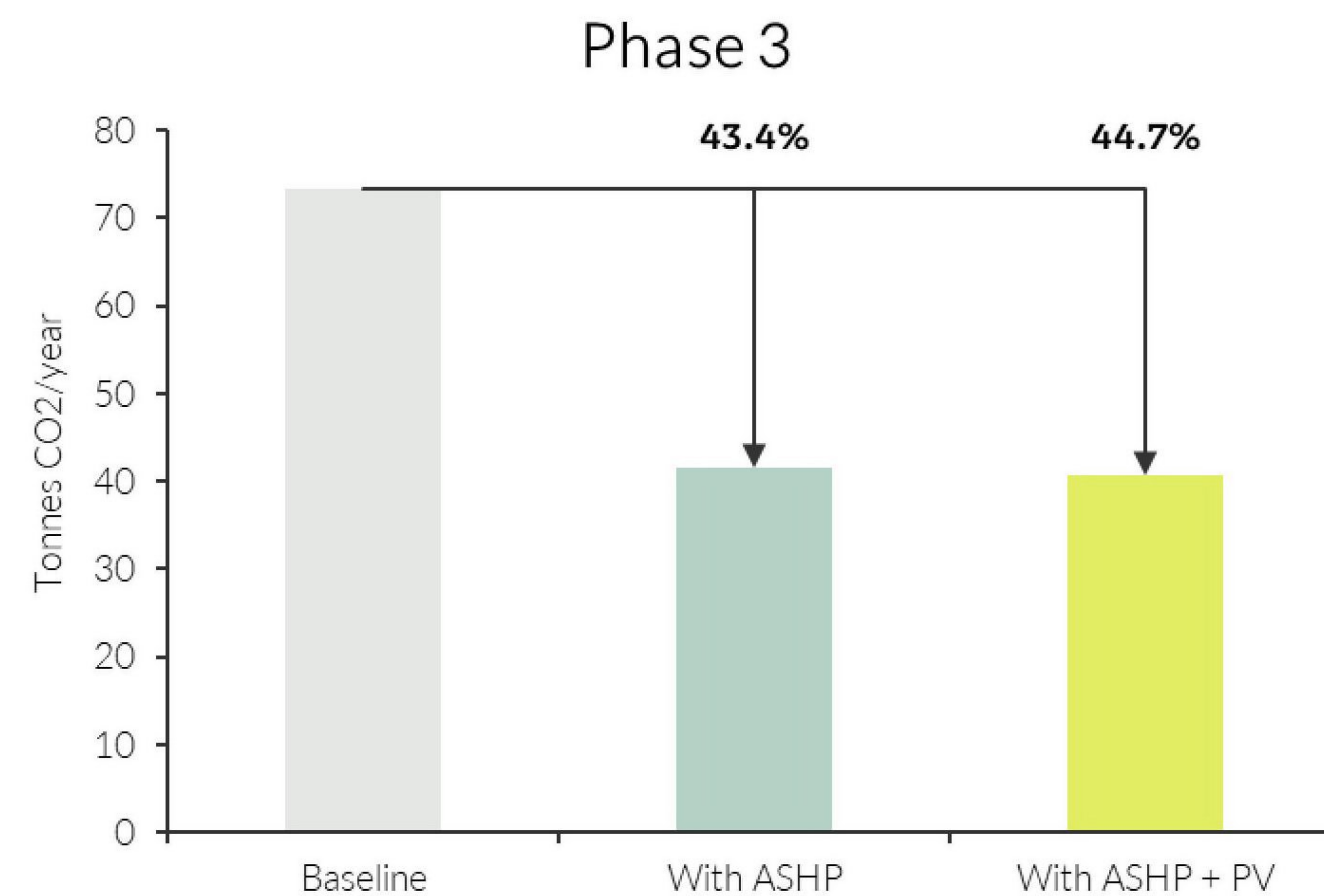


Figure 3: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – Phase 3.

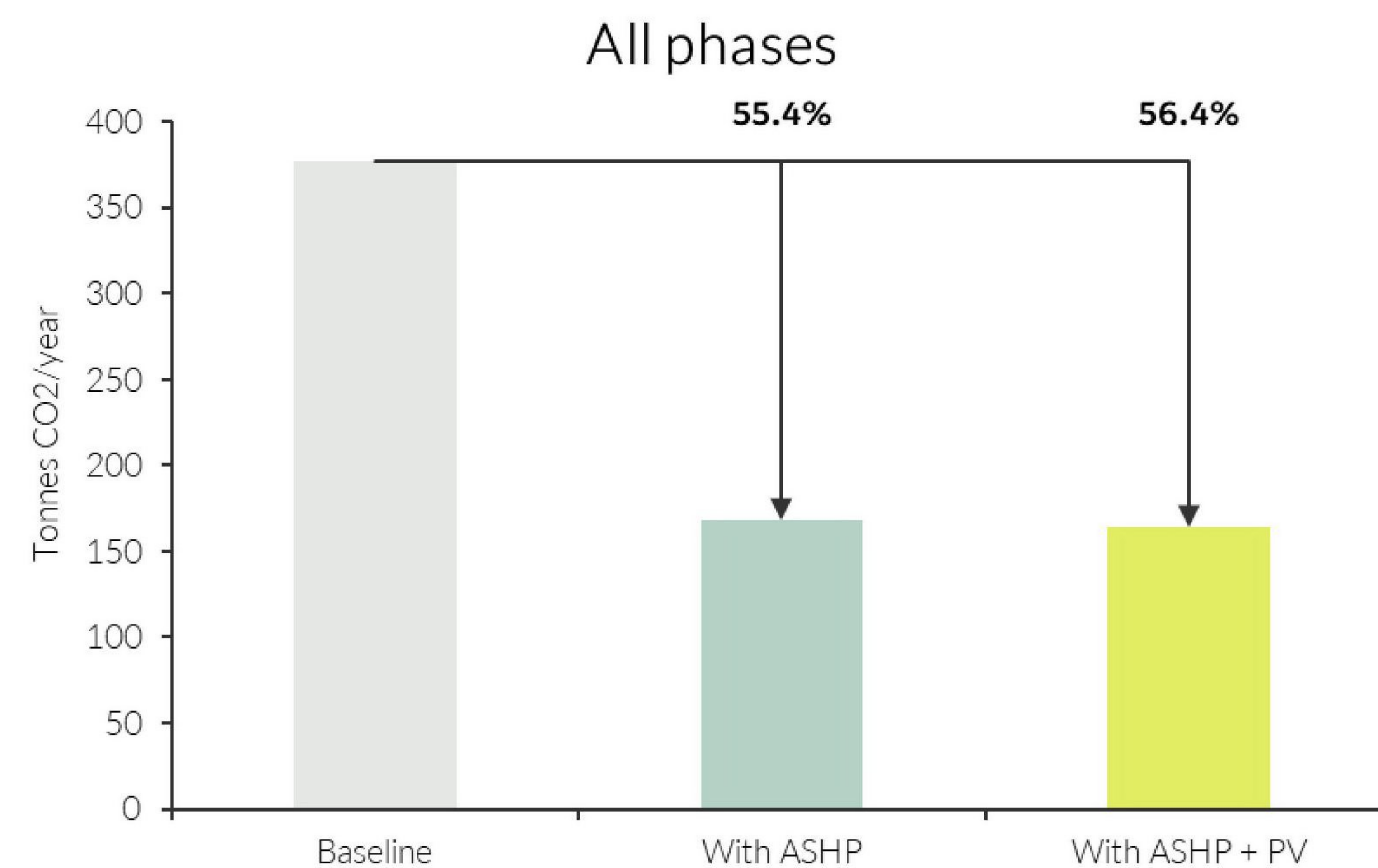


Figure 4: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – All Phases.

## Conclusions

The key conclusions of the energy strategy are;

- It is expected that all three phases of the Proposed Development will achieve a >40% regulated carbon emission reduction in comparison to a Part L compliant baseline, based on the updated SAP10.1 carbon factors. This is achieved through a combination of passive design and energy efficiency measures, VRF/ASHP providing space heating and cooling as well as domestic hot water in the student accommodation and the laboratory spaces, and PV arrays of 55m<sup>2</sup>, 85m<sup>2</sup> and 44m<sup>2</sup> PV on the roofs of Phase 1, Phase 2 and Phase 3 respectively.
- The Proposed Development is targeting a BREEAM Excellent rating for the majority of the assessments covering the different areas within the development, with the exception of the 'shell only' retail units which are targeting Very Good. This is due to limitations in the BREEAM Ene01 methodology as explained in Section 8. Further details are included in the BREEAM pre-assessment summary in Appendix C.
- It is understood that there is no district heating network in the vicinity of the scheme and therefore a connection is not proposed.
- The use of water-efficient fixtures and fittings is proposed for the development, in line with BREEAM requirements.



## 1. Introduction.

This report has been produced in support of the Full Planning application of the redevelopment of the Clarendon Centre located in the centre of Oxford, hereafter referred to as the Proposed Development.

### 1.1 The proposed development

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The proposed development is divided into three phases:

Phase 1 includes new-build laboratory building, with the structure on the north end of the building proposed to be retained, and retail space on the ground and first floors on the Queen Street side.

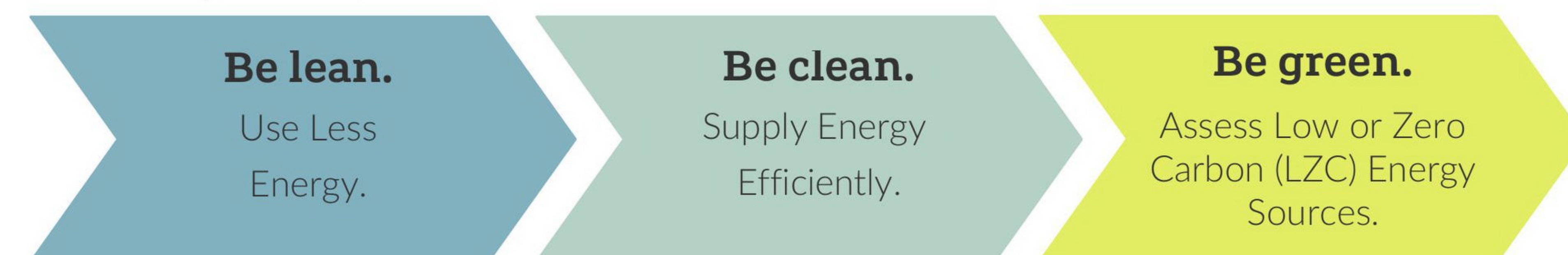
Phase 2 includes the refurbishment of the office building facing Cornmarket Street (Clarendon House), a student accommodation building with retained structure and new building fabric, and retail units on the ground floor.

Phase 3 comprises a new office building with retail units on the ground floor.

### 1.2 Approach to the strategy

This report sets out the approach to reducing carbon dioxide (CO<sub>2</sub>) emissions and optimising energy efficiency within the development. This strategy summarises the pertinent regulatory and planning policies applicable to the Proposed Development, and sets targets commensurate with these policies, which the Proposed Development will seek to achieve.

The Energy Strategy has been developed using a ‘fabric first’ approach through the ‘Be Lean’, ‘Be Clean’, ‘Be Green’ energy hierarchy.



### 1.3 Definitions and limitations

#### Definitions:

The following definitions should be understood throughout this statement:

- **Energy demand:** the ‘room-side’ amount of energy which must be input to a space to achieve comfortable conditions. In the context of space heating, this is the amount of heat which is emitted by a radiator, or other heat delivery mechanism.
- **Energy requirement:** the ‘system-side’ requirement for energy (fuel). In the context of a space heating system using a gas boiler, this is the amount of energy combusted (e.g. gas) to generate useful heat (i.e. the energy demand).
- **Regulated CO<sub>2</sub> emissions:** the CO<sub>2</sub> emissions emitted as a result of the combustion of fuel, or ‘consumption’ of electricity from the grid, associated with regulated sources (those controlled by Part L of the Building Regulations).

#### Limitations:

The appraisals within this statement are based on Part L calculation methodology and should not be understood as a predictive assessment of likely future energy requirements or otherwise. Occupants may operate their

systems differently, and/or the weather may be different from the assumptions made by Part L approved calculation methods, leading to differing energy requirements.



Figure 5: View of the Proposed Development.



## 2. Drivers.

### 2.1 National

#### Building Regulations: Approved Document Part L

Approved Document Part L (2013, England edition) is the Building Regulation relating to the conservation of fuel and power in buildings. The Approved Document is separated into two sections: Part L1 and Part L2. Part L1 relates to new dwelling and Part L2 relates to buildings other than dwellings.

Part L of the Building Regulations is the mechanism by which government is driving reductions in the regulated CO<sub>2</sub> emissions from new buildings. There are five criteria in Part L2A when demonstrating compliance. To gain compliance, only Criterion 1 and parts of Criterion 4 (which states that Building Emissions Rate remains consistent from design through to construction) are regulation and therefore mandatory. The approaches to meet the other criteria are 'reasonable provision' and alternative proposals are permissible. This should be checked with the Building Control Body (BCB) to confirm that they meet the energy efficiency requirements.

Criterion 1	<b>Achieving the Target Emission Rate (TER)</b> The calculated CO <sub>2</sub> emission rate for the building known as the Building Emission Rate (BER) must not be greater than the Target Emission Rate (TER).
Criterion 2	<b>Limits on Design Flexibility</b> The performance of the building fabric and the heating, cooling, hot water, ventilation and fixed lighting systems should achieve reasonable standards of energy efficiency.
Criterion 3	<b>Limiting the Effects of Solar Gains</b> Demonstrate that the building has appropriate passive control measures to limit solar gains within occupied areas.
Criterion 4	<b>Building performance consistent with the BER</b> Buildings should be constructed and equipped so that performance is consistent with the calculated BER.
Criterion 5	<b>Provisions for energy-efficient operation of the building</b> A building log book should be provided to the owner of the building with sufficient information about the building, the building services and the maintenance requirements.

Table 1: Part L criteria.

#### Grid decarbonisation

Recent progress in the energy sector has seen emissions associated with electricity consumption reduce drastically, however this is not reflected in the current Building Regulations which was last updated in 2013. National policy is unlikely to be updated before 2021, increasing the gulf between compliance and reality.

The carbon factor for grid-supplied electricity in current Building Regulations (2013) is 0.519kgCO<sub>2</sub>/kWh; as can be seen in the graph below, this is a fair reflection of the performance of the grid at that time. However, in response to legally-binding targets established in line with the Paris Agreement, significant progress has been made in decarbonising the electricity grid over the past six years.

At the end of 2018, the Department for Business, Energy, and Industrial Strategy (BEIS) reported the carbon factor of electricity as having fallen to 0.177kgCO<sub>2</sub>/kWh; a 65% reduction compared to that in Part L, 2013. The consequence of this is a discrepancy between emissions calculated using current building regulations methodology from electrical plant and any technologies which offset grid electricity (such as solar PV) compared to the reality of their performance. In a compliance-led world, buildings are being specified with technologies with the objective of reducing CO<sub>2</sub> emissions which, in fact, may not offer any real benefit at all.

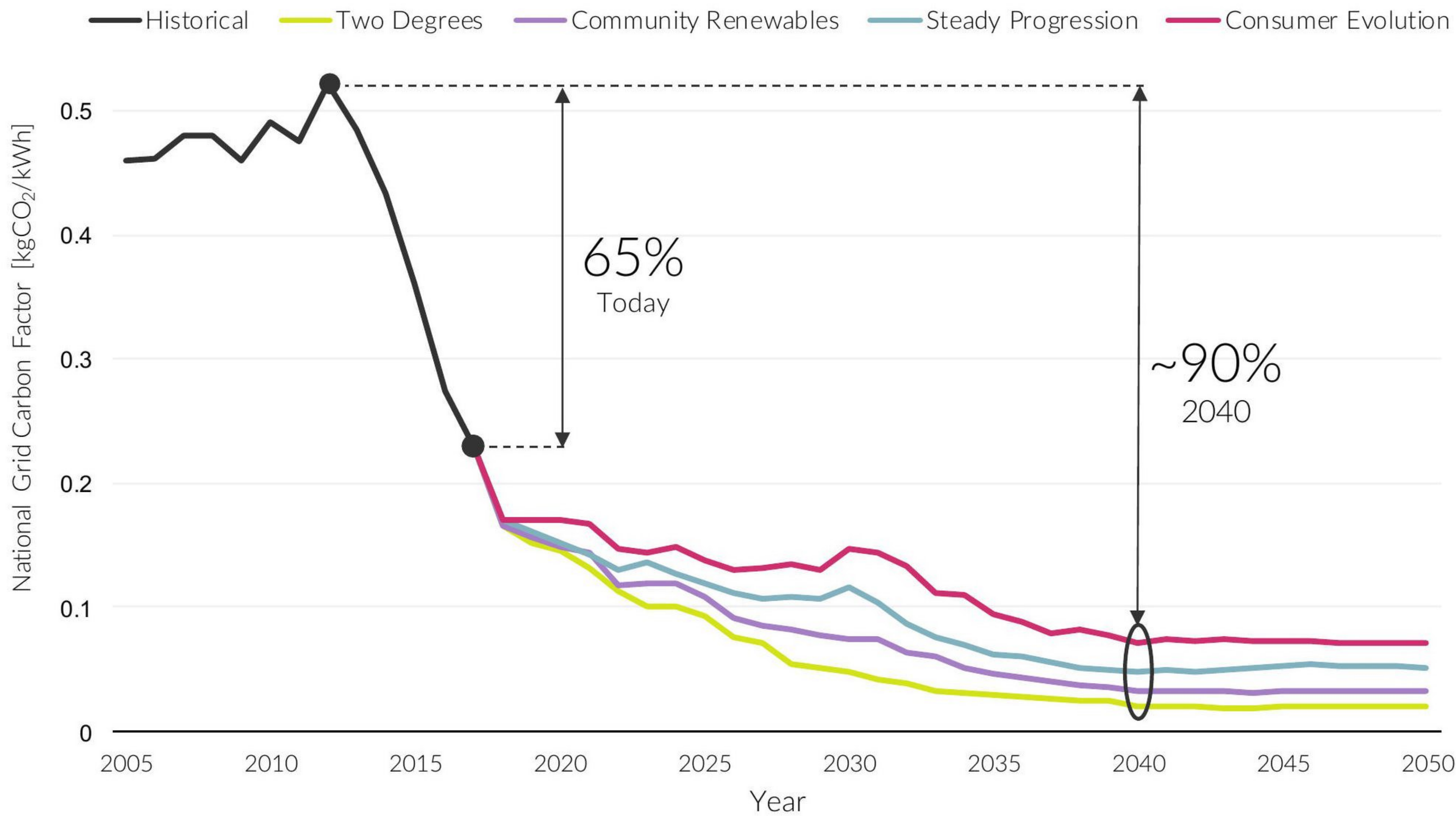


Figure 6: Historic and future projected carbon factor for the National Grid (8% transmission and distribution losses are included).

To reflect this, and to inform the carbon factors in the next update of the Building Regulations, the BRE published in 2018 the Draft SAP10.0 carbon factors. A further update of these carbon factors was released by the BRE in October 2019 (SAP 10.1), bringing the carbon factor of electricity more in line with what is expected to be the grid electricity in the coming years. In line with this, SAP 10.1 carbon factors are proposed to be used in the energy calculations to demonstrate compliance with the planning targets.

Fuel	Part L 2013 Carbon Factor (kgCO <sub>2</sub> /kWh)	Draft SAP10.0 (July 2018) Carbon Factors (kgCO <sub>2</sub> /kWh)	Draft SAP10.1 (Oct 2019) Carbon Factors (kgCO <sub>2</sub> /kWh)
Main Gas	0.216	0.210	0.210
Electricity	0.519	0.233	0.136

Table 2: Current (Part L 2013) and proposed (SAP10 and SAP10.1) carbon factors for natural gas and grid-supplied electricity.



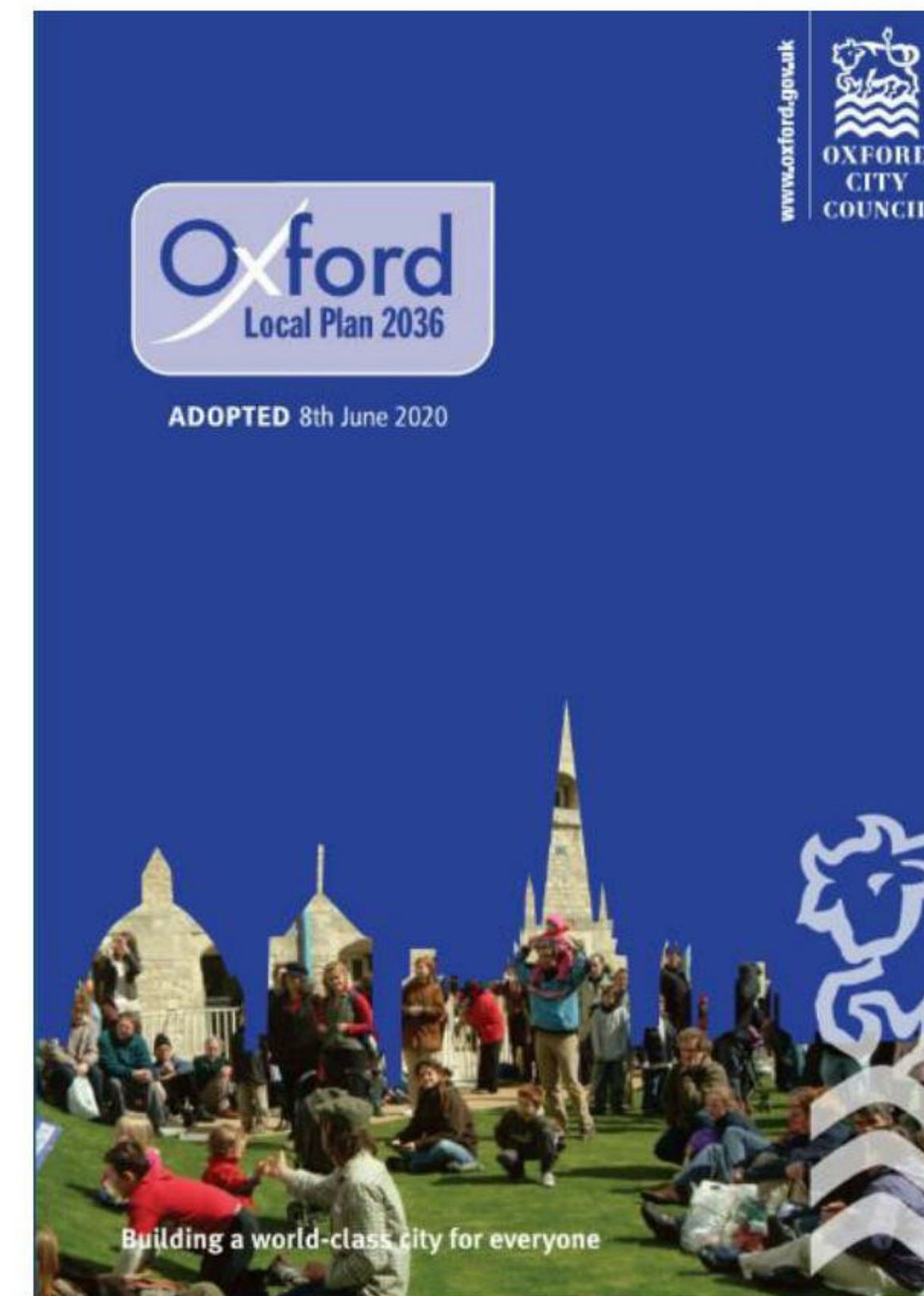
## 2.2 Local

### Oxford Local Plan 2036 (Adopted June 2020)

Oxford City Council has recently adopted the new Oxford Local Plan 2036.

Policy *RE1 Sustainable design and construction* of the new local plan relates to all new-build non-residential schemes over 1,000m<sup>2</sup>; and requires developments to:

- incorporate the following sustainable design and construction principles where relevant:
  - a) Maximising energy efficiency and the use of low carbon energy;
  - b) Conserving water and maximising water efficiency;
  - c) Using recycled and recyclable materials and sourcing them responsibly;
  - d) Minimising waste and maximising recycling during construction and operation;
  - e) Minimising flood risk including flood resilient construction;
  - f) Being flexible and adaptable to future occupier needs; and
  - g) Incorporating measures to enhance biodiversity value.
- An energy statement is to be submitted. The energy statement should include details as to how the policy will be complied and monitored.
- Achieve a BREEAM 'Excellent' rating.
- Achieve minimum 40% reduction in regulated CO<sub>2</sub> beyond the Building Regulations Part L 2013 baseline.
- Connect to a heat network if one exists in close proximity to the scheme.
- Water efficiency: Proposals for non-residential development are to meet a minimum of four credits under the BREEAM assessment.





3. Cooling and overheating.

3.1 Cooling hierarchy.

The following cooling hierarchy has been followed to limit the effects of heat gain in summer:

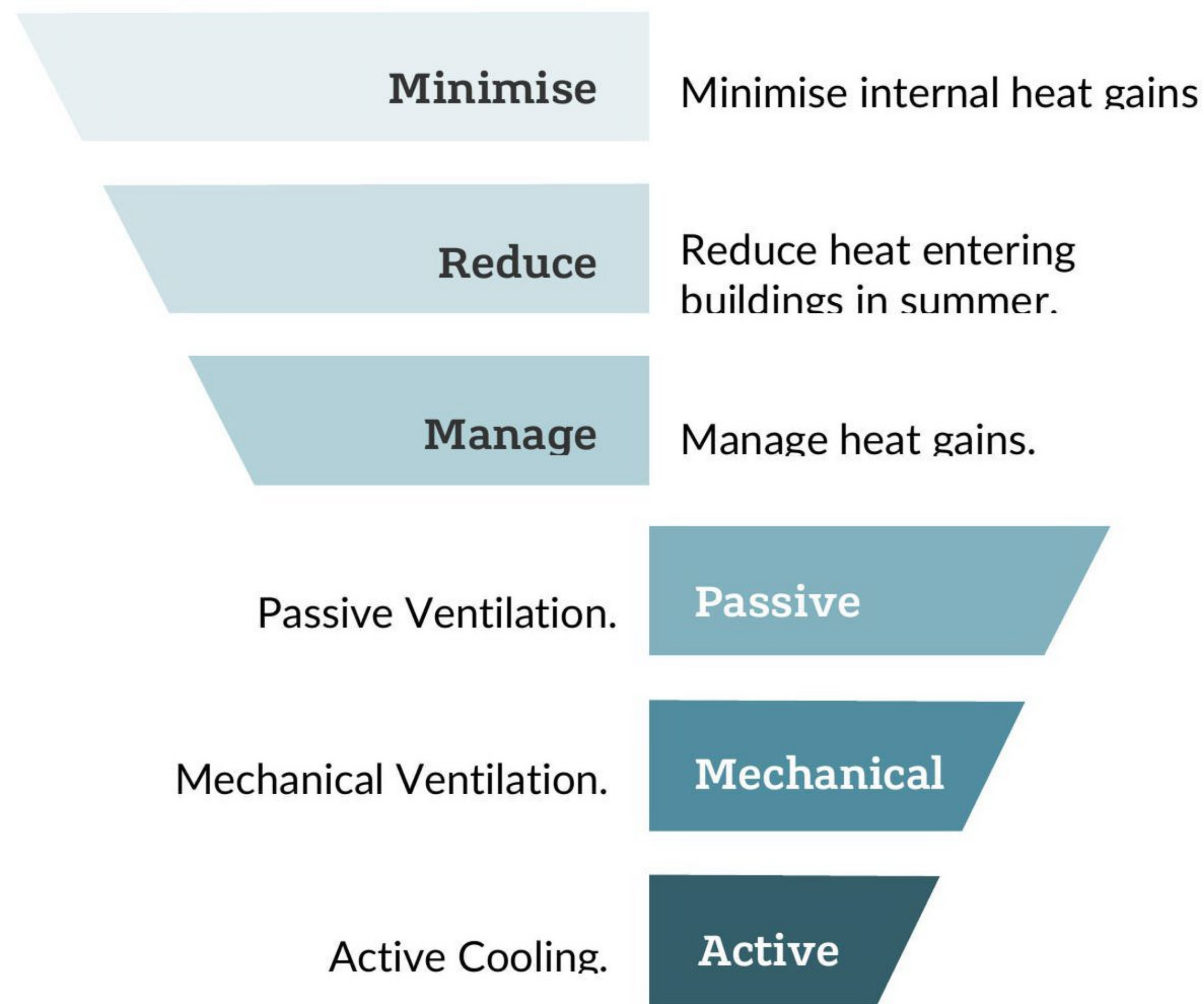


Figure 7: Cooling hierarchy.

3.2 Mitigation strategy.

The following mitigation methods will be implemented at the Proposed Development.

Minimising internal heat generation and summer heat gains

The following mitigation methods will be implemented to minimise the internal heat generation through energy efficient design at the Proposed Development:

- Energy efficient lighting with low heat output.
- Insulation to heating and hot water pipework and minimisation of dead legs to avoid standing heat loss (from pipework to local units).
- Suitable glazing ratio responding to orientation and space use.
- Extensive solar shading.
- Glazing with adequate g-value to limit solar heat gains (where appropriate).

Ventilation strategy

A natural ventilation strategy is proposed for the student accommodation. The overheating risk in these areas will be assessed against the CIBSE TM59 criteria using dynamic thermal modelling.

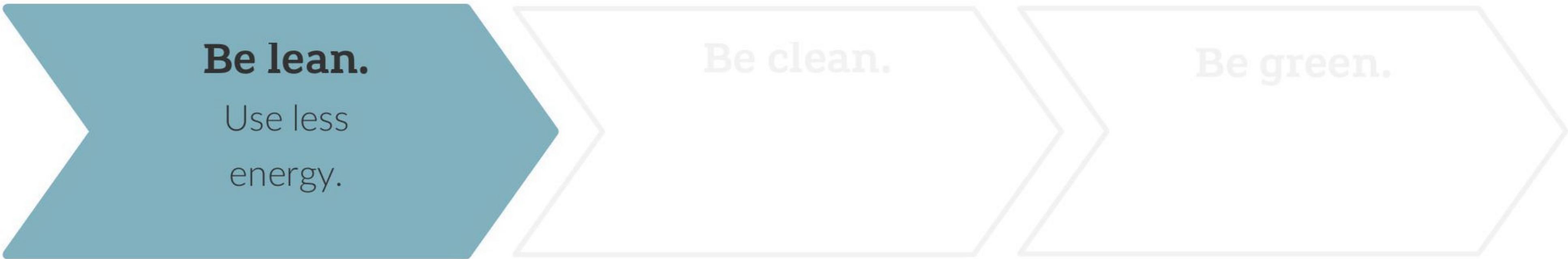
Openable windows are also proposed to be provided in the office spaces to provide the users the option to open if they chose to do so, however comfort cooling is also proposed to be provided in order to ensure thermal comfort is achieved in peak summer conditions and when opening windows is not appropriate.

Opening windows would not be appropriate in the laboratory areas due to the specific ventilation requirements in these spaces. Cooling via fan coil units is proposed to be provided in the laboratories.



4. Be lean.

Passive design and energy efficiency measures form the basis for the reduction in overall energy demand and carbon emissions for the proposed development. This energy strategy aims to reduce the energy demand initially by optimising the envelope and building services within the development.



4.1 Passive design and energy efficiency features

Passive design measures are those which reduce the demand for energy within buildings, without consuming energy in the process.

These are the most robust and effective measures for reducing CO<sub>2</sub> emissions as the performance of the solutions, such as wall insulation, is unlikely to deteriorate significantly with time, or be subject to change by future property owners. In this sense, it is possible to have confidence that the benefits these measures provide will continue at a similar level for the duration of their installation.

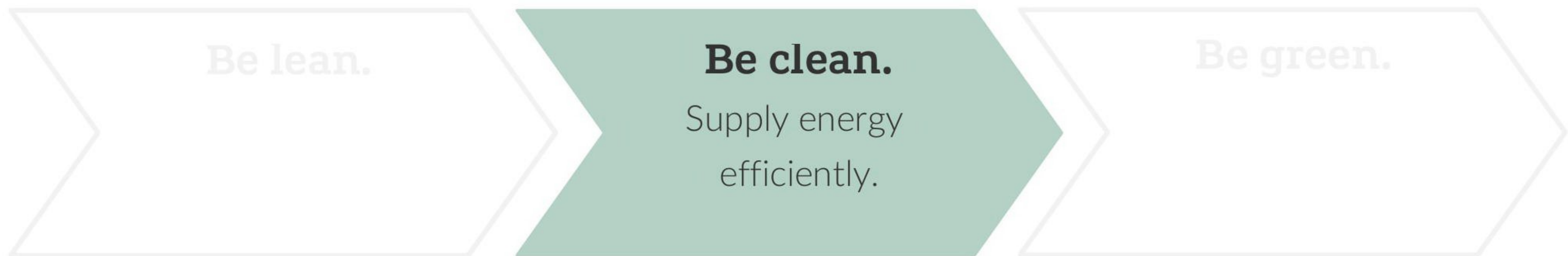
	<b>Fabric performance</b> A 'fabric first' approach will be taken in order to reduce the energy demand and CO <sub>2</sub> emissions from the Proposed Development. The design aims to achieve fabric U-values in line with current good practice, as detailed in the table below:			
		Labs (Phase 1)	Student Resi (Phase 2)	Office areas (Ph 2 & 3)
		Retail (Ph 1, 2 & 3)		
	Wall U-value	0.18 W/m <sup>2</sup> .K	0.18 W/m <sup>2</sup> .K	New external wall: 0.18 W/m <sup>2</sup> .K Retained external wall: 0.26 W/m <sup>2</sup> .K
	Ground Floor U-value	New GF slab: 0.20 W/m <sup>2</sup> .K Existing GF slab: 0.26 W/m <sup>2</sup> .K	Existing GF slab: 0.26 W/m <sup>2</sup> .K	New GF slab: 0.20 W/m <sup>2</sup> .K Existing GF slab: 0.26 W/m <sup>2</sup> .K
	Roof U-value	0.15 W/m <sup>2</sup> .K	0.15 W/m <sup>2</sup> .K	0.15 W/m <sup>2</sup> .K
	Air Permeability	3 m <sup>3</sup> /h.m <sup>2</sup> at 50Pa	5 m <sup>3</sup> /h.m <sup>2</sup> at 50Pa	Ph2: 5 m <sup>3</sup> /h.m <sup>2</sup> at 50Pa Ph3: 3 m <sup>3</sup> /h.m <sup>2</sup> at 50Pa
	Windows	U = 1.4 W/m <sup>2</sup> .K g = 0.4	U = 1.4 W/m <sup>2</sup> .K g = 0.4	U = 1.4 W/m <sup>2</sup> .K g = 0.4

	<b>Air tightness</b> Air infiltration could significantly affect the heat losses of the building and could lead to occupant's discomfort due to cold drafts. Pursuing an airtight building would have benefits in terms of reducing space heating requirements and improving occupant's thermal comfort. An air tightness value of 3m <sup>3</sup> /h/m <sup>2</sup> @50Pa is currently being targeted for Phases 1 and 3, and an air tightness value of 5m <sup>3</sup> /h/m <sup>2</sup> @50Pa for Phase 2 where the façade is proposed to be retained in the office areas.
	<b>Mechanical ventilation</b> It is proposed that high-efficiency mechanical ventilation with heat recovery will be adopted in the laboratory and office areas. Natural ventilation is currently proposed in the student accommodation while ventilation in the shell only retail spaces will be installed by the tenants.  Mechanical ventilation is essential to maintain good indoor air quality by providing fresh air and extracting vitiated air. Providing fresh air minimises the risk of stale and stagnant air and limits the risk of condensation and mould. Coupled to a heat exchanger, the warmth in extracted air can be recovered and delivered to the supply air. In this mode, the ventilation system reduces space heating and cooling demand.  To reduce the electrical energy associated with fan usage, plant and systems will be optimised to achieve low specific fan powers.  Additionally, it is proposed that the ventilation will be controlled based on CO <sub>2</sub> sensors in the spaces where appropriate to modulate in line with fresh air requirements. This will ensure that good indoor air quality is maintained at all times while minimising fan power consumption and ventilation heat losses.
	<b>Domestic hot water (DHW) system</b> To limit the demand for hot water, all spaces will include the use of water-efficient fixtures and fittings, in line with BREEAM requirements. Further details of the target performance under the BREEAM Water credits can be found in the BREEAM Pre-assessment summary.
	<b>Natural daylight and lighting strategy</b> In the context of retail, office and lab usages, lighting tends to provide a significant contribution to regulated CO <sub>2</sub> emissions. As such, the implementation of energy efficient lighting design is paramount to reducing overall emissions for these spaces. Therefore, it is anticipated that the Proposed Development will be supplied with high efficiency lighting installations representing best practise. Appropriate lighting automatic lighting controls will be incorporated.  The façade design also provides an enhanced daylighting provision to the office and laboratory spaces, which will assist in reducing the lighting energy consumption.  As well as reduced energy requirement that will be achieved by implementing these strategies, the contribution to the cooling requirements and internal heat gains will be reduced. This will further reduce the total energy requirements and CO <sub>2</sub> emissions of each building.
	<b>Metering and monitoring</b> The metering strategy will be developed in line with CIBSE TM39 requirements. This will include an appropriate level of sub-metering which will enable the future tenants/building managers to monitor the energy consumption by end use and facilitate the optimisation of the energy performance of the buildings.



5. Be clean.

This stage of the energy hierarchy refers to the use of heat networks or on-site Combined Heat and Power (CHP) in order to provide energy and reducing consumption from the national grid and gas networks, through the generation of electricity, heating and cooling on-site.



5.1 Development demand

The proposed development's approximated thermal demand has been initially calculated to be 79% compared to 21% for non-thermal demand.

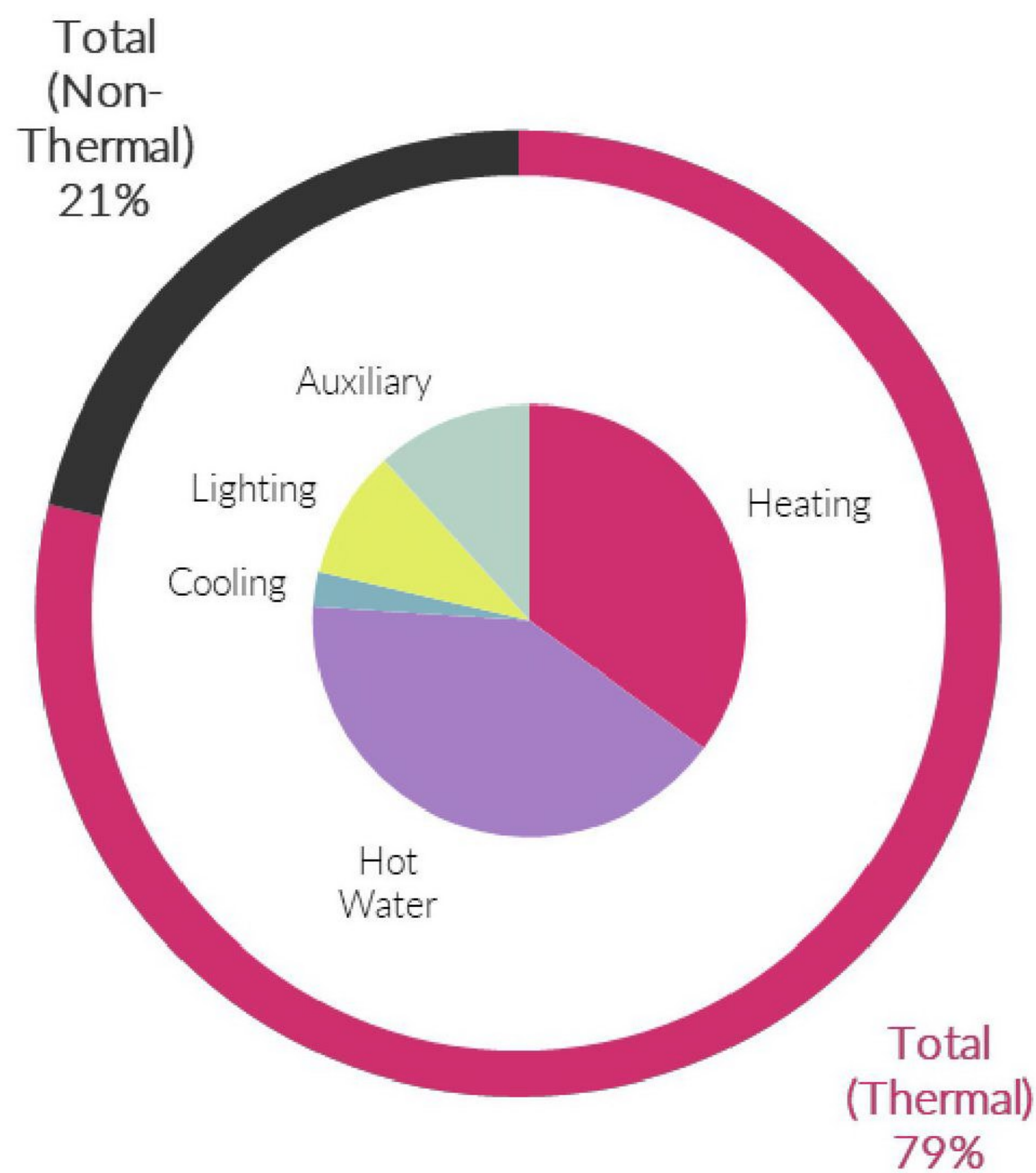


Figure 8: Thermal and electrical demand chart.

5.2 Be clean: network and technologies

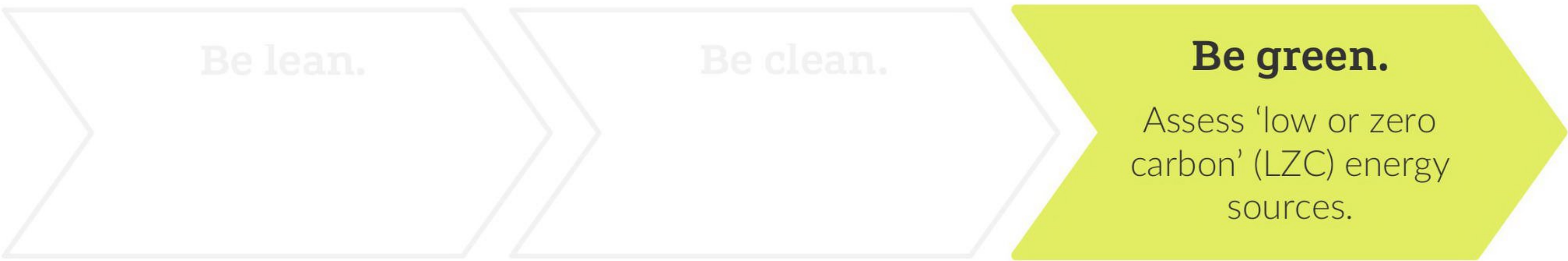
In line with policy aspirations, the following sections summarise the considerations of the low-carbon energy supply measures that could be considered, and the implications to the carbon emissions of the scheme.

	<b>Decentralised heat and energy networks</b> It is understood that there is no district heating network in the vicinity of the scheme and therefore a connection is not proposed.
	<b>Combined heat and power (CHP)</b> This section considers the relative merits of providing a stand-alone on-site heat network served by a dedicated energy centre with either Combined Heat and Power (CHP) or Combined Cooling Heat and Power (CCHP).  CHP and CCHP engines can work more efficiently than their traditional counterparts, i.e. grid electricity and gas boilers. It is estimated that where thermal demand is adequate, CHP or CCHP can achieve reductions in primary energy demand relative to traditional sources of approximately 30%. Such plant is more efficient than deriving electricity from the grid as the heat generated in the process of creating the electricity can be used on-site, and the electricity does not have to travel great distances over the national grid before use, thus minimising transmissive losses. However, the rapid decarbonisation of the electricity grid, as explained in section 2.1, has greatly reduced the carbon emission saving potential of CHP, as it relies on burning fossil fuel to generate electricity. Using the SAP10.1 carbon emission factors, which are a closer representation of the current carbon intensity of the electricity grid than those in Part L 2013, the use of CHP would result in an increase in the carbon emissions when compared to a traditional arrangement of gas boilers and grid electricity. As the carbon intensity of the grid electricity decreases, the use of CHP will become less favourable. Therefore, a CHP is not proposed to be installed in the development.



6. Be green.

The final step of the energy hierarchy explores the feasibility of Low and Zero Carbon (LZC) technologies to allow for the production of renewable energy onsite in order to offer a further reduction in carbon emissions.



6.1 Low and zero carbon (LZC) technology assessment

Low or zero carbon technologies harness energy from the environment and convert this to a useful form. Many renewable technologies are available, however, not all of these are commercially viable or suitable for city centre locations.

	<p><b>Photovoltaics</b></p> <p>Photovoltaic panels harness energy from daylight and convert this into useful energy in the form of electricity. A PV system requires viable roof space in order for the array to be installed and function effectively.</p> <p><b>Suitability to proposed development:</b></p> <p>The high expected electricity consumption of the development would make the installation of PV panels appropriate for the scheme. The size of the PV array that will be installed is limited by the available, accessible and unshaded roof area. The impact of PV panels on overall heights and views is also a limiting factor for the installation of this technology.</p> <ul style="list-style-type: none"><li>– It is proposed to install 55m<sup>2</sup> of high efficiency panels (~9.9kWp) on Phase 1, with an estimated annual output of 8,400kWh.</li><li>– On Phase 2, it is proposed to install 85m<sup>2</sup> of high efficiency panels (~15.3kWp), with an estimated annual output of 13,000kWh.</li><li>– On Phase 3, a 44m<sup>2</sup> PV array (~7.9kWp), with an estimated annual output of 6,700kWh, is proposed to be installed on the roof above the level 5 restaurant, subject to protected views review.</li></ul> <p>In order to minimise the visual impact of PVs, the panels are proposed to be installed with low angles to minimise the overall height of the array. The calculations undertaken for this energy strategy have been adjusted for the slightly reduced efficiency in output resulting from the low angle installation.</p>
	<p><b>Solar thermal</b></p> <p>Solar Thermal Panels are similar to PV Panels in that they harness energy from solar. This technology however converts solar into thermal energy that can offset the demand on hot water generation systems.</p> <p><b>Suitability to proposed development:</b></p> <p>Solar thermal technology would have a peak output in summer when less heat is needed, while the output would be significantly reduced in the winter months when the demand is higher, which would affect the carbon saving potential of the system. Additionally, the limited available roof area would be better utilised for the installation of PV panels.</p>

	<p><b>Ground source heat pump</b></p> <p>Ground source heat pumps (GSHP) utilise either water extracted from an aquifer (open loop) or a fluid circulated within underground pipework (closed loop) as the heat source in a refrigeration process enabling them to produce hot water, typically at around 45°C, that can be used as a heating medium in buildings. Due to the relatively constant temperature of the ground at depth (typically 10-14°C in the UK) this produces heat more efficiently in winter than an air source heat pump, and with lower carbon emissions than a gas-fired boiler.</p> <p><b>Suitability to proposed development:</b></p> <p>The installation of ground source heat pumps is not appropriate for the scheme as a large proportion of the existing structure is proposed to be retained, making the installation of GSHP boreholes unfeasible.</p>
	<p><b>Air source heat pump</b></p> <p>Air Source Heat Pumps (ASHP) use a refrigeration cycle to extract heat from the air. The efficiency of the system is therefore dependent on outside air temperature. The system can be run in reverse to provide cooling.</p> <p><b>Suitability to proposed development:</b></p> <p>ASHP have been identified as a suitable technology to provide low carbon heat. Air to water heat pumps are proposed to provide space heating and cooling to the laboratory areas as well as heating to the student accommodation. ASHP are also proposed to generate domestic hot water in these areas. VRF (variable refrigerant flow) air source heat pumps are proposed to provide space heating and cooling to the office areas. It is anticipated that VRF heat pumps will also provide heating and cooling in the retail areas (to be installed by the tenants).</p>
	<p><b>Wind turbine</b></p> <p>For efficient operation and to yield high energy output, wind turbines require a smooth laminar flow of air. The Proposed Development is located within a dense urban environment therefore the wind flow profile is erratic and consequently, is not conducive to high annual yields.</p> <p><b>Suitability to proposed development:</b></p> <p>Installing wind turbines on the roof would have a significant visual impact, which is particularly important given the location of the site in the city centre of Oxford. Moreover, mounting wind turbines on the roofs of the Proposed Development could result in unacceptable vibration and resonance being felt within the occupied spaces. The turbines are also likely to generate noise which may be a nuisance to neighbouring properties. This scenario could result in the turbines being switched off. Considering the impacts described above, the limited CO<sub>2</sub> emission benefit and visual impact of wind turbines on the character and appearance of the area, micro wind turbines will not be proposed to be installed in the development.</p>
	<p><b>Biomass</b></p> <p>A biomass boiler uses a natural fuel such as wood chips or wood pellets for combustion. Since it uses a natural resource that can be replanted it is considered as a renewable energy source subject to the distance the fuel is transported. The carbon dioxide emitted from burning biomass is balanced by that absorbed during the fuel's production. Biomass heating therefore approaches a carbon neutral process.</p> <p><b>Suitability to proposed development:</b></p> <p>Significant carbon emission reductions could be achieved with the use of biomass boilers. However, large fuel storage volumes are required to maintain continuous operation during the winter months. As such, area take for such plant is high. Fuel deliveries in city-centre locations can prove difficult and security of fuel supply is an important consideration. Additionally, exhaust gases would require significant treatment to avoid degrading local air quality, with NOx emissions likely to be higher than with a gas-fired boiler solution. Biomass boilers are therefore not proposed for the development.</p>



7. Results

Part L simulations have been carried out using IES-VE. Details of the input parameters are shown in Appendix B.

Different scenarios have been modelled, as described in Table 3, in order to illustrate how the proposed development is expected to perform against the planning target of 40% regulated carbon emission reduction.

Model	Description
Baseline	Part L compliant baseline, based on a gas boiler scenario for space heating and hot water generation.
With heat pumps	<p><b>Phase 1</b> With air to water heat pumps providing space heating, cooling and hot water in the labs, and VRF heat pumps providing space heating and cooling in the retail areas*.</p> <p><b>Phase 2</b> With air to water heat pumps providing space heating and hot water pre-heat in the student accommodation, and VRF heat pumps providing space heating and cooling in the office and retail areas*.</p> <p><b>Phase 3</b> With VRF heat pumps providing space heating and cooling in the office and retail areas*.</p> <p><i>*Systems in the retail areas will be installed by the tenants. Modelling assumptions included in the energy assessment are outlined in Appendix B.</i></p>
With heat pumps and PV	<p><b>Phase 1</b> As above, with a 55m<sup>2</sup> (~9.9kWp) PV array with an estimated annual output of 8,400kWh.</p> <p><b>Phase 2</b> As above, with an 85m<sup>2</sup> (~15.3kWp) PV array with an estimated annual output of 13,000kWh.</p> <p><b>Phase 3</b> As above, with an 44m<sup>2</sup> (~7.9kWp) PV array with an estimated annual output of 6,700kWh.</p>

Table 3: Description of the different scenarios assessed.

A summary of the results is shown in Figure 9 (using SAP10.1 carbon factors).

Key findings are;

- With the proposed passive and energy efficiency measures, and the use of Air Source Heat Pumps (ASHP)/Variable Refrigerant Flow (VRF) systems for space heating and cooling, as well as domestic hot water in the lab and student accommodation spaces (as described in Table 3), the following carbon emission reductions are expected to be achieved based on SAP10.1 carbon factors:
  - Phase 1 is expected to achieve a 44.7% reduction in regulated carbon emissions compared to a Part L compliant baseline.
  - Phase 2 is expected to achieve a 62.4% reduction in regulated carbon emissions compared to a Part L compliant baseline.

- Phase 3 is expected to achieve a 43.4% reduction in regulated carbon emissions compared to a Part L compliant baseline.
- With the aforementioned heat pump solution, and a 55m<sup>2</sup>, 85m<sup>2</sup> and 44m<sup>2</sup> PV arrays on the roof of Phase 1, Phase 2 and Phase 3 respectively, the following carbon emission reductions are expected to be achieved based on SAP10.1 carbon factors:
  - Phase 1 is expected to achieve a 46.3% reduction in regulated carbon emissions compared to a Part L compliant baseline.
  - Phase 2 is expected to achieve a 63.2% reduction in regulated carbon emissions compared to a Part L compliant baseline.
  - Phase 3 is expected to achieve a 44.7% reduction in regulated carbon emissions compared to a Part L compliant baseline.
- The PV array allocations have been based on the availability of suitable roof area for each phase.
- The proposed electric solution is expected to provide further carbon savings compared to the baseline in the future as the electricity grid further decarbonises.

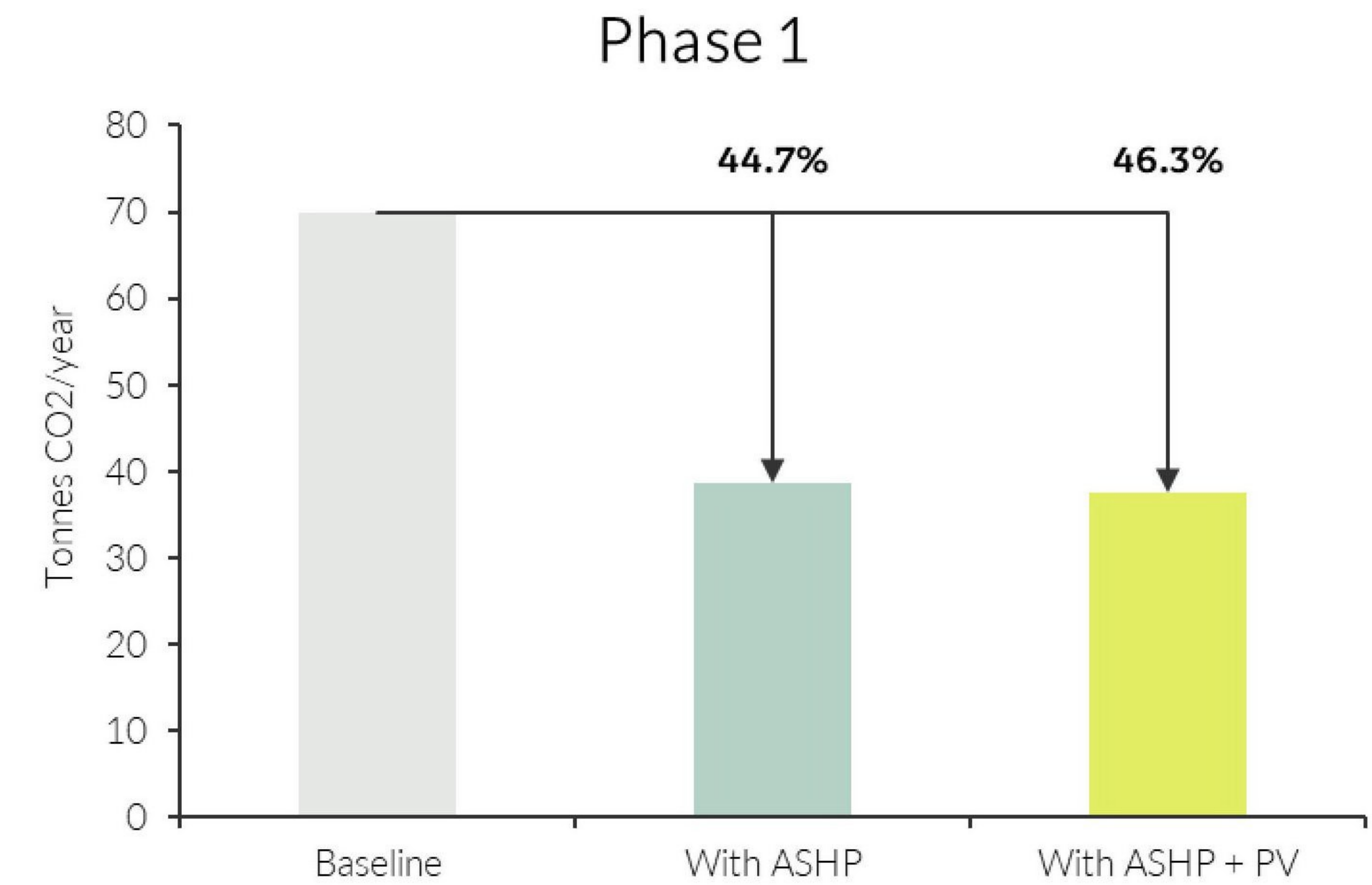


Figure 9: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – Phase 1.



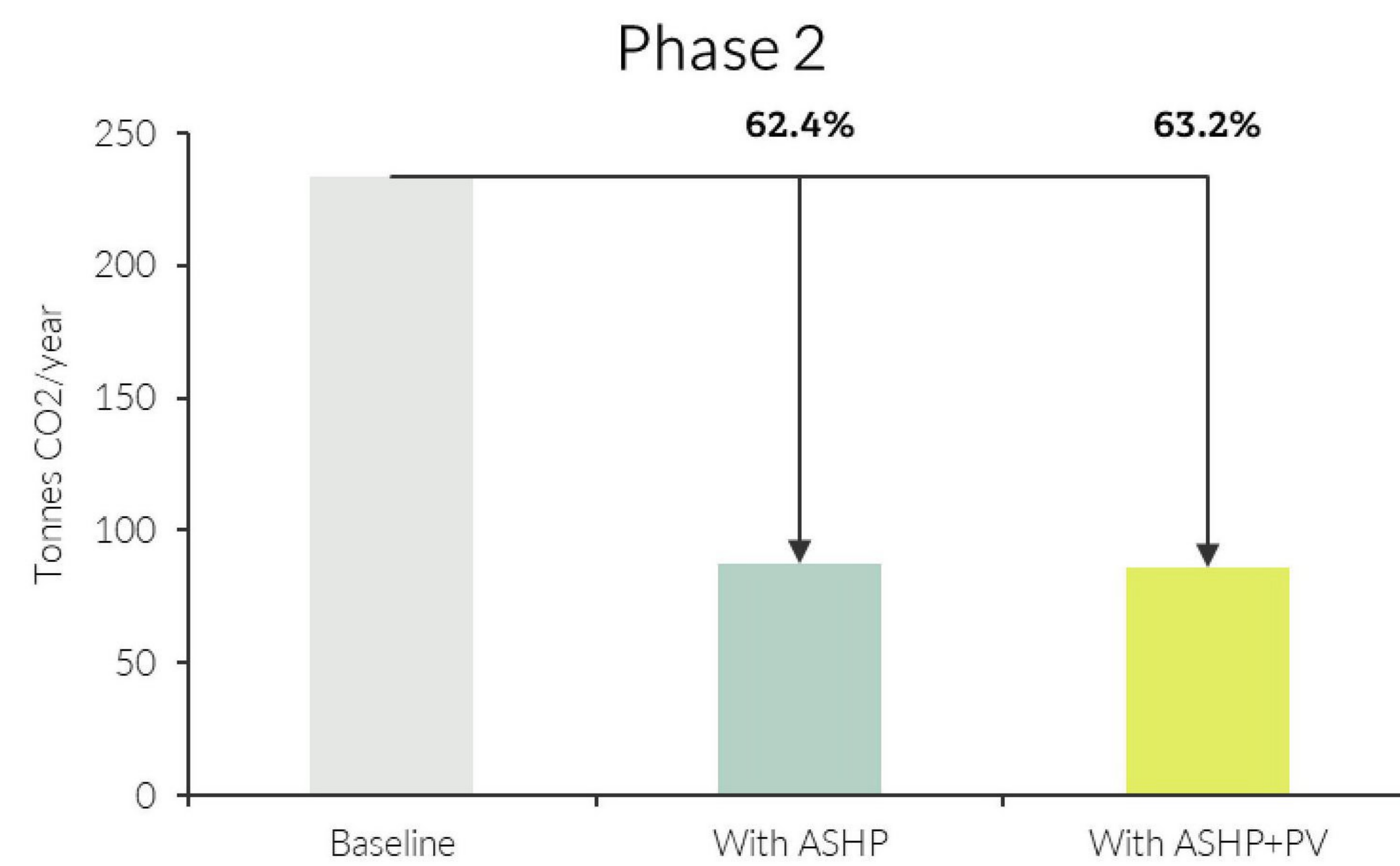


Figure 10: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – Phase 2.

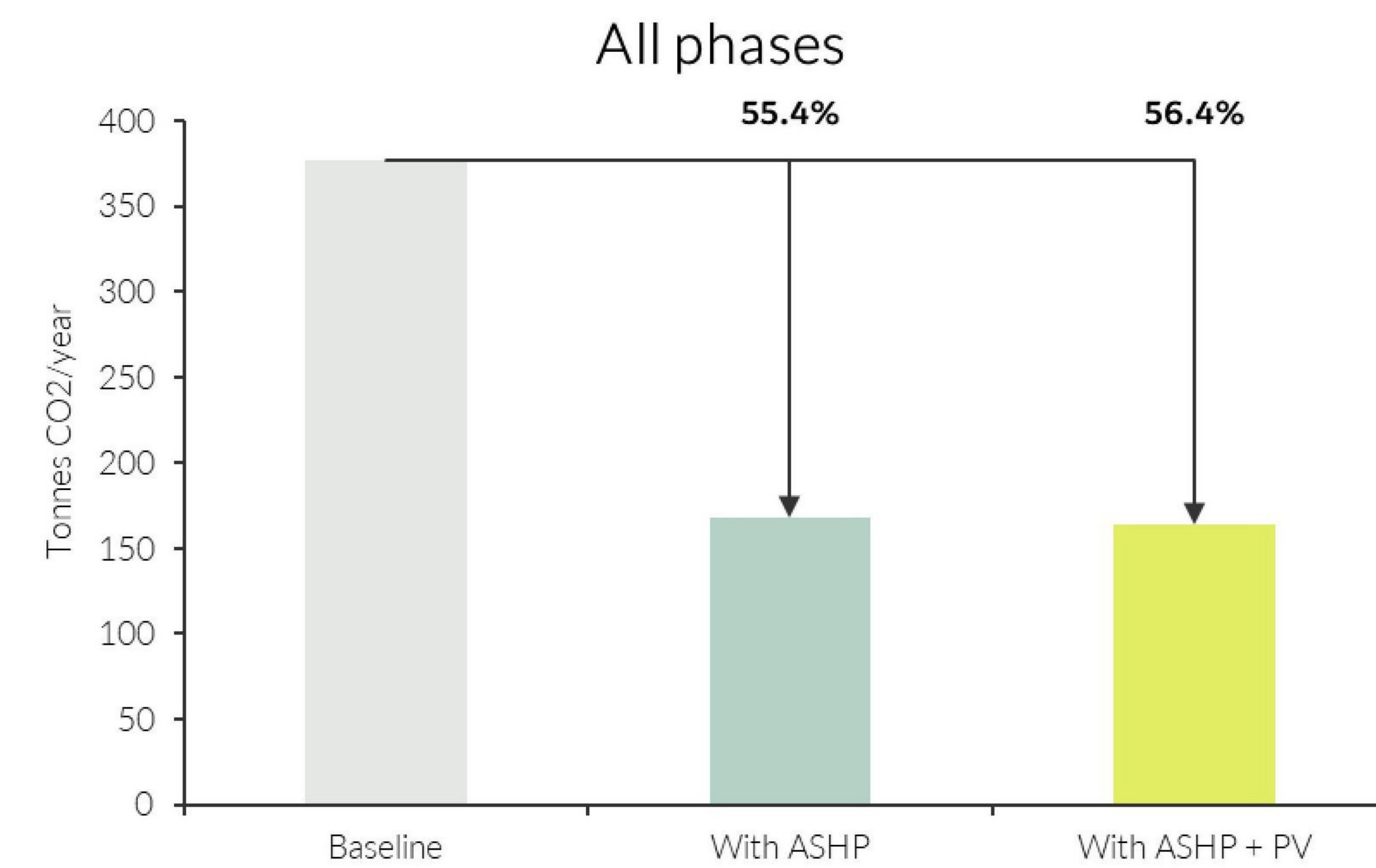


Figure 12: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – All Phases.

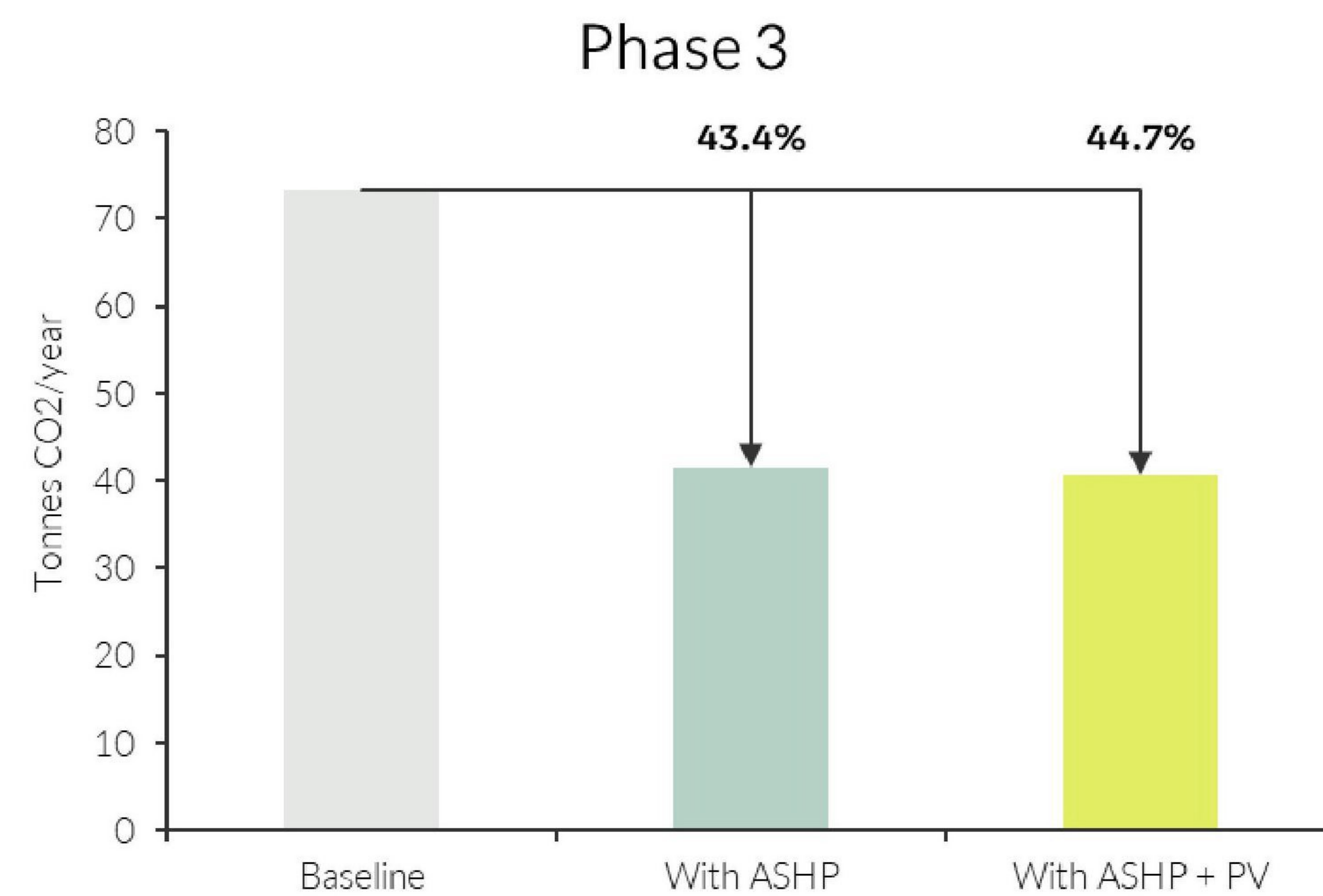


Figure 11: Estimated carbon reduction compared to the baseline, using SAP10.1 carbon factors – Phase 3.



## 8. Additional requirements in Policy RE1 of the Oxford Local Plan

This section reviews how the Proposed Development addresses the requirements included in Policy RE1 Sustainable design and construction of the Oxford Local Plan.

### Maximising energy efficiency and the use of low carbon energy

Sections 3 to 7 of these report details the energy efficiency and low carbon energy measures proposed for the scheme, including how the Proposed Development achieves a reduction in regulated carbon emissions of >40% compared to a Part L compliant baseline, in line with policy requirements.

### Conserving water and maximising water efficiency

The use of water-efficient fixtures and fittings is proposed for the development, in line with BREEAM requirements. 4 credits under Wat 01 are targeted in the different BREEAM assessments where applicable (Wat 01 credits are not applicable to the 'shell only' retail assessments).

Further details of the target performance under the BREEAM Water credits can be found in the BREEAM Pre-assessment summary.

### Using recycled and recyclable materials and sourcing them responsibly

An embodied carbon assessment is being carried out for the proposed development. As part of this assessment, the design team will look to minimise the embodied carbon through the selection of materials, prioritising sourcing materials responsibly.

### Minimising waste and maximising recycling during construction and operation

Construction waste will be minimised, with the project targeting 4 credits under BREEAM Wst01 Construction waste management in the different BREEAM assessments, which include requirements on carrying out a pre demolition audit and setting targets for limiting construction waste and maximising the waste diversion from landfill.

### Minimising flood risk including flood resilient construction

The site is located in a low flood risk zone. Additionally, the proposed development does not incur in an increase of the impermeable area on site.

### Being flexible and adaptable to future occupier needs

The project is targeting BREEAM Wst06 credit for functional adaptability in the different BREEAM assessments, which will involve the development of a functional adaptation strategy to explore measures that could be taken to accommodate future changes of use over the lifespan of the buildings.

### Incorporating measures to enhance biodiversity value.

The current proposed design includes areas of green roof, which are expected to improve the biodiversity of the site. Further options to enhance the biodiversity value of the site will be explored at a later design stage.

### BREEAM.

A number of BREEAM assessments are proposed to be carried out for the different areas of the Proposed Development. The project is targeting BREEAM Excellent for most of the areas, with the exception of the 'shell only' retail units which will be targeting a Very Good rating, for the reasons explained below.

The BREEAM targets for the different areas of the development are outlined below. Further details are included in the BREEAM pre-assessment summary included in Appendix C.

#### Phase 1

- Office (labs) – Excellent
- Retail 'shell only' – Very Good

#### Phase 2

- Student accommodation – Excellent
- Office – Excellent
- Retail 'shell only' – Very Good

#### Phase 3

- Office – Excellent
- Retail 'shell only' – Very Good

### Retail 'shell only' assessments

In order to achieve a BREEAM Excellent rating, a minimum of 4 credits under Ene 01 must be achieved. The BREEAM methodology for 'shell only' assessments requires the minimum 4 Ene 01 credits to be achieved solely through improvements in the 'heating and cooling demand' metric of the Part L assessment, which relates to fabric performance and does not take into account the energy efficiency of the building services. Because of these limitations in the BREEAM methodology, achieving the minimum Ene 04 credits in a 'shell only' retail assessment is unfeasible even with high performance fabric. For this reason, a Very Good rating is proposed to be targeted for the retail spaces.

In order to ensure that energy efficiency is maximised in the retail spaces, even if not reflected in the BREEAM Ene 01 calculations, a fit-out guide with the minimum expected energy standards to be met will be provided to the incoming tenants.

### Connecting to a heat network if one exists in close proximity to the scheme.

It is understood that there is no district heating network in the vicinity of the scheme and therefore a connection is not proposed.

## 9. Conclusions

The key conclusions of the energy strategy are;

- It is expected that all three phases of the Proposed Development will achieve a >40% regulated carbon emission reduction in comparison to a Part L compliant baseline, based on the updated SAP10.1 carbon factors. This is achieved through a combination of passive and energy efficiency measures, VRF/ASHP providing space heating and cooling as well as domestic hot water in the student accommodation and the laboratory spaces, and a 55m<sup>2</sup>, 85m<sup>2</sup> and 44m<sup>2</sup> PV arrays on the roof of Phase 1, Phase 2 and Phase 3 respectively.
- The Proposed Development is targeting a BREEAM Excellent rating for the majority of the assessments covering the different areas within the development, with the exception of the 'shell only' retail units which are targeting Very Good. This is due to limitations in the BREEAM Ene01 methodology as explained in Section 8. Further details are included in the BREEAM pre-assessment summary in Appendix C.
- It is understood that there is no district heating network in the vicinity of the scheme and therefore a connection is not proposed.
- The use of water-efficient fixtures and fittings is proposed for the development, in line with BREEAM requirements.



## Appendix A: Grid Decarbonisation.

### Historic progress

The carbon factor of the National Grid – the amount of carbon dioxide released per kilowatt hour of electricity produced and distributed – is recognised in current Building Regulations as being 0.519 kgCO<sub>2</sub>/kWh. However, the national mix of electricity generation methods is progressing towards greener solutions with renewable sources accounting for 29.4% of the electricity generated in the UK in 2017; up from 24.5% in 2016 [3].

As a consequence, the Building Regulations Part L 2013 value of the National Grid carbon factor has been shown to be substantially higher than how the grid is performing in reality. This severely impacts the calculated emissions produced by all heat raising plant which use electricity directly or generate it to offset other emissions. The figure below shows how the mix of generation techniques serving the National Grid, as well as the associated carbon factor, has varied over the past six years – encouragingly, the carbon intensity of the grid has reduced to less than half its value in 2012 [HM Government, “Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal”, 02 January 2018].

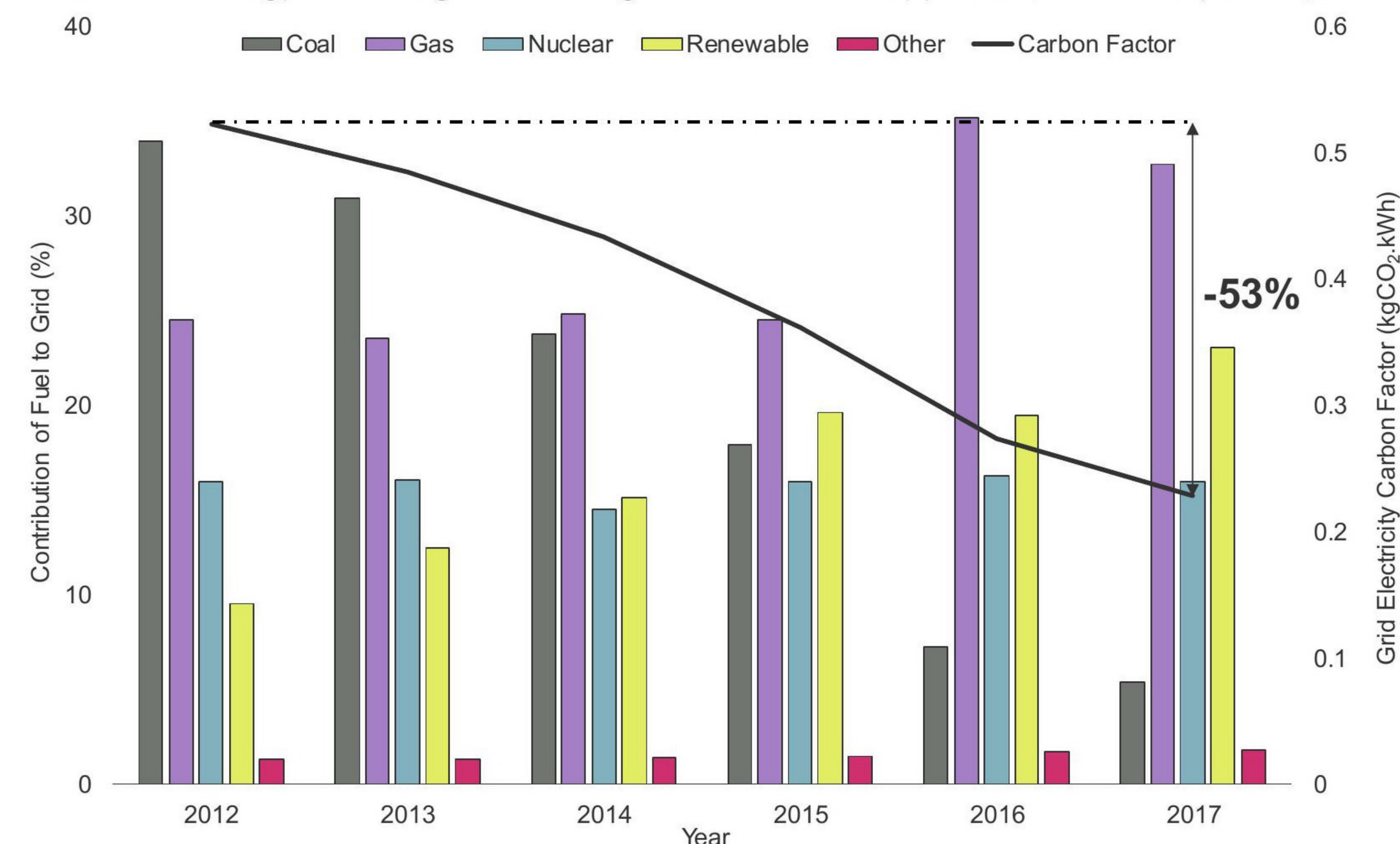


Figure 13: Historic mix of generation methods and associated carbon factor for the National Grid. 8% transmission and distribution losses are included. Sources: *electricityinfo.org* (generation mix); *BEIS Green Book* (historic carbon factors).

### Future projections

The Future Energy Scenarios (FES) document, produced by the National Grid, discusses how the UK's energy landscape is changing. In this year's report, FES 2018, the carbon factor of the National Grid is projected to be less than 0.170 kgCO<sub>2</sub>/kWh by the end of this year, meaning the actual carbon emissions associated with electricity consumption are much lower than reported in Building Regulations. This means that, under the Part L 2013 methodology the CO<sub>2</sub> emissions associated with electrically-driven plant are being overestimated by over 200%. FES 2018 makes projections of how the mix of generation in the grid is likely to change between now and 2050 – the year by which the Climate Change Act 2008 set the target of reducing the UK's CO<sub>2</sub> emissions by 80% from 1990 levels.

FES discusses these projections in one of four scenarios with the best and worst-case scenarios (from an emissions perspective) being Two Degrees and Steady State respectively. Two Degrees describes a situation where a combination of drastic policy intervention and innovation pushes an ambitious agenda with a focus on long-term environmental goals – it is described as the 'cost optimal pathway to meet the UK's 2050 carbon

emissions reduction target'. In contrast, Steady State is a 'business as usual' situation, where society is focussed on the short term and ensuring the security of the UK's energy supply.

The figure below combines these future trajectories with the actual carbon intensity of the National Grid over the past seven years. The reported emissions associated with electricity generation have fallen steeply since 2012 and in all cases, the FES 2018 scenarios see the carbon factor of electricity fall below 100gCO<sub>2</sub>/kWh by 2035.

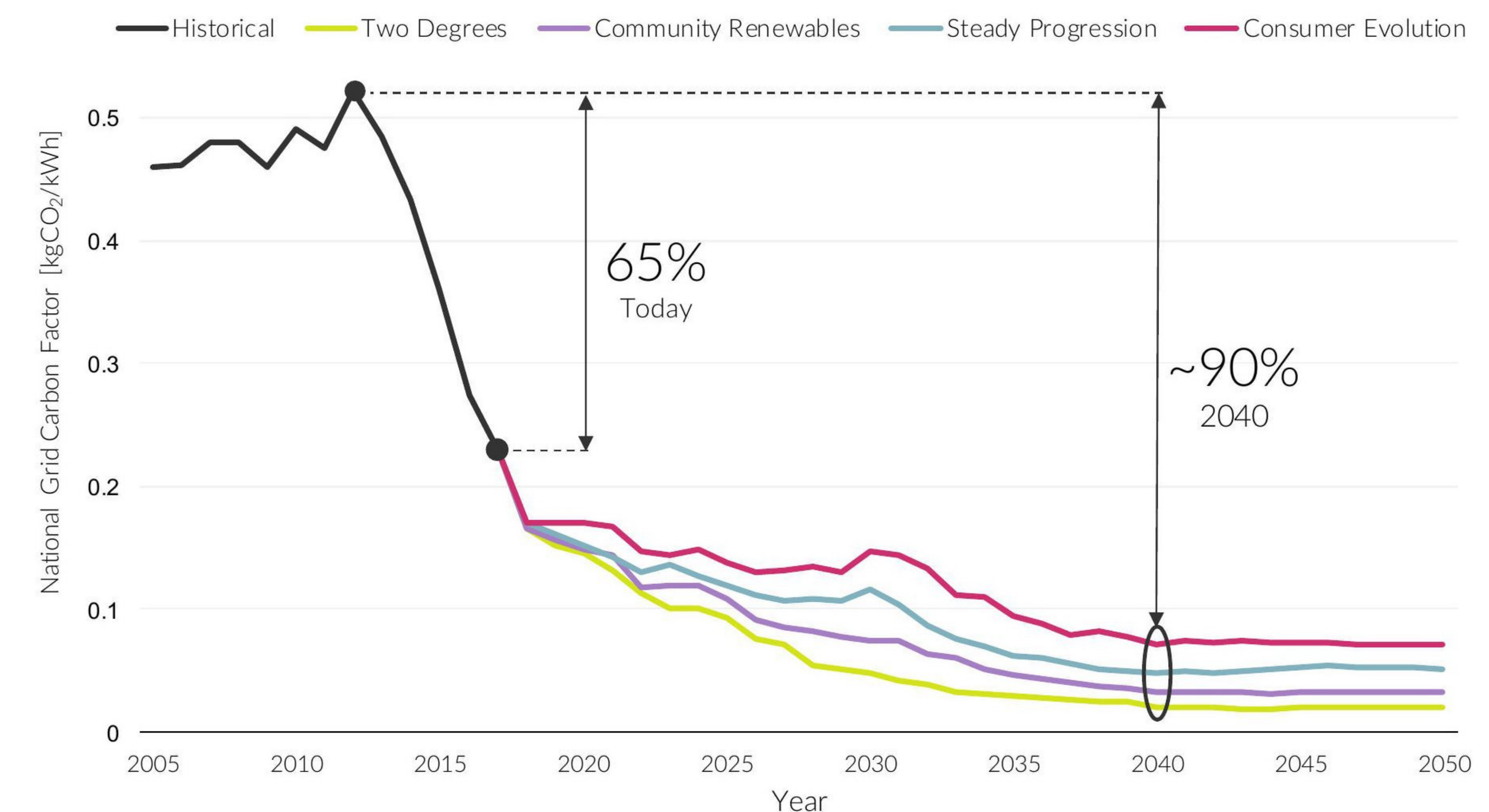


Figure 14: Historic and future projected carbon factor for the National Grid. 8% transmission and distribution losses are included. Sources: *BEIS Green Book* (historic carbon factors); *National Grid Future Energy Scenarios (FES) 2018* (future projected carbon factors).

### Consequences for servicing

The carbon emissions associated with the combustion of natural gas are unlikely to change significantly in the coming years, whereas the carbon factor of grid electricity, and consequently the emissions from operating electrical plant, is projected to decrease in all scenarios in the long-term.

As noted however, misrepresentative building regulations mean that even today, electrical plant performs far better from an emissions perspective than calculated using the Part L 2013 methodology. The following graph shows the net annual emissions of four different servicing strategies for a recent large scale, mixed use development. Whilst different in scope and scale to the Proposed Development, the impact incorrect carbon factor has on the calculated emissions is obvious. For these reasons, an electrical servicing strategy is beneficial both today, and in the future.





Figure 15: Net annual emissions for a large scale mixed use development for four different heating strategies using both the current Building Regulations Part L 2013 grid carbon factor and the reported performance of the grid in 2016. Source: Future Energy Scenarios 2017.

**Shifting focus**

As the carbon emissions associated with the generation of electricity continue to reduce, the proportion of the UK’s overall greenhouse gas emissions for which the electricity sector is responsible will fall.

The carbon factor of natural gas is likely to remain relatively static. With 85% of homes in the UK relying on gas to supply their heating and hot water, as well as a significant proportion of commercial buildings, heating buildings and industry represents an ever-greater proportion of UK emissions – 32% in 2015 [HM Government, “Clean Growth Strategy,” October 2017].

In order for the UK to maintain a trajectory sufficient to meet the 2050 Paris Agreement decarbonisation target of an 80% reduction in annual greenhouse gas emissions over 1990 levels, focus must necessarily shift to other contributors. The BEIS Clean Growth Strategy provides an indication of the direction the UK’s energy policy is likely to take and “...sets out [the government’s] proposals for decarbonising all sectors of the UK economy through the 2020s.” This includes investing in infrastructure and mechanisms to facilitate a transition to low emission vehicles and strengthening the energy performance requirements of new and existing buildings.

As engineers and specialists in the built environment, staying abreast of this dynamism across all sectors is essential for Hoare Lea.

**Updates to the Standard Assessment Procedure (SAP10 and SAP10.1)**

In July of 2018, the BRE released an update to the Standard Assessment Procedure (SAP) – used to assess dwellings’ compliance with Building Regulations – for consultation. A further updated draft was issued in October 2019, superseding the July 2018 version.

The following represents a brief summary of the changes to carbon factors over the current methodology, SAP2012 (which is used in current Building Regulations, Part L 2013).

**Carbon factors**

Many of the fuel types recognised in SAP have had their fuel types, carbon factors and primary energy factors updated following the decarbonisation of the grid and other national infrastructure changes. The table below shows the changes in carbon factor from SAP 2012 to SAP 10 and SAP10.1. It is worth noting the significant improvement for the electricity carbon factor (almost a quarter of that used in 2012).

It is likely that that the next update to Building Regulations Part L will specify the SAP 10.1 carbon factors associated with natural gas and electricity.

Fuel	SAP 2012 (Part L 2013) Carbon Factor (kgCO <sub>2</sub> /kWh)	Draft SAP10.0 (July 2018) Carbon Factors (kgCO <sub>2</sub> /kWh)	Draft SAP10.1 (Oct 2019) Carbon Factors (kgCO <sub>2</sub> /kWh)
Main Gas	0.216	0.210	0.210
Electricity	0.519	0.233	0.136

Table 4: Current (SAP2012) and proposed (SAP10 and SAP10.1) carbon factors for natural gas and grid-supplied electricity.



## Appendix B: Technical parameters – Part L model

### Compliance software and procedure

The proposed Clarendon Centre redevelopment has been assessed using The National Calculation Methodology for demonstrating compliance with Approved Document Part L.

### Part L2A compliance

A dynamic simulation model was created to assess the design of Clarendon Centre.

Integrated Environmental Solutions Virtual Environment (IESve) is a Dynamic Simulations Modelling (DSM) software package which has the capabilities of enabling the user to create a virtual representation of a scheme. The results presented in this report were calculated using the approved compliance software IESve 2019 (v2019.2.0.0).

The IESve model for Clarendon Centre was drawn to geometry received from MCA on 4 September 2020.

Figure 16, Figure 17 and Figure 18 show the IES models created to assess Part L2A compliance.

### IES modelling disclaimer

The calculations produced by Hoare Lea have been carried out with the information provided by MCA to determine whether the proposed Clarendon Centre can achieve compliance with Approved Document Part L2A of the Building Regulations.

It should be noted that the data generated by this work is obtained using computer simulations. These simulations are the best means of predicting the performance of the buildings at this stage. Full certainty can only be achieved by measuring the performance of the buildings and associated systems after a period of use.

The actual energy usage for the buildings once occupied may vary from the calculated values submitted to Building Control. These differences will occur due to a number of variable parameters between the modelled buildings and the actual buildings. Such differences will include the hours, levels of occupancy, how the plant is used and the design criteria with regards to how the rooms are environmentally controlled.

Whilst the simulations have been undertaken in good faith using reasonable skill and care, Hoare Lea can take no responsibility for differences between the computer simulations and the actual performance of the completed buildings due to the inherent complexity and variability of the physics in a building and its environment.

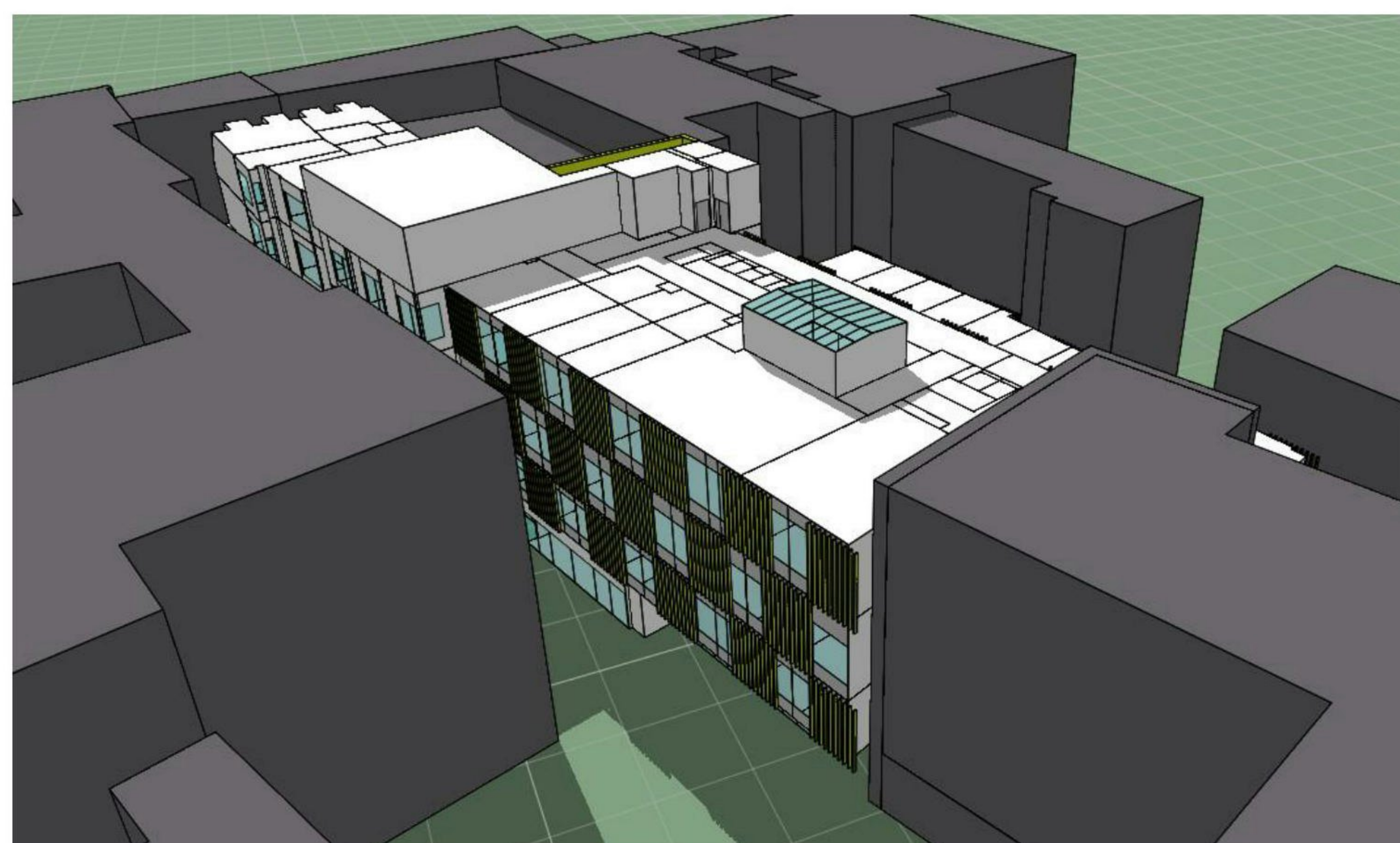


Figure 16: Image of the IES-VE model of the Proposed Development (Phase 1).



Figure 17: Image of the IES-VE model of the Proposed Development (Phase 2).



Figure 18: Image of the IES-VE model of the Proposed Development (Phase 3).



Calculation parameters

Fabric parameters

	Labs (Phase 1)	Student Resi (Phase 2)	Office areas (Ph 2 & 3)	Retail (Ph 1, 2 & 3)
Exposed/Ground Floor U-value (W/m²K)	New GF slab: 0.20 W/m².K  Existing GF slab: 0.26 W/m².K	Existing GF slab: 0.26 W/m².K	New GF slab: 0.20 W/m².K  Existing GF slab: 0.26 W/m².K	New GF slab: 0.20 W/m².K  Existing GF slab: 0.26 W/m².K
External Wall U-value (W/m²K)	0.18 W/m².K	0.18 W/m².K	New external wall: 0.18 W/m².K Retained external wall: 0.26 W/m².K	External wall: 0.18 W/m².K
Roof U-value (W/m²K)	0.15	0.15	0.15	0.15
Glazing U-value (Inc. frame) (W/m²K)	1.40 (g value: 0.4)	1.4 (g value: 0.4)	1.4 (g value: 0.4)	1.4 (g value: 0.4)
Air Permeability (m³/h.m²) @ 50Pa	3	5	5 (phase 2) 3 (phase 3)	5 (phase 2) 3 (phases 1 & 3)

Table 5: Target building fabric performance parameters.

System parameters

	Labs (Phase 1)	Student Resi (Phase 2)	Office areas (Ph 2 & 3)	Retail (Ph 1, 2 & 3)
Space Heating/Cooling efficiency	ASHP for heating and cooling via FCU SEER: 4.5 SCOP: 3.2	ASHP for heating only via radiators SCOP: 3.2  Office/landlord areas: VRF/DX SCoP = 3.8 VRF/DX SEER = 4.50	Office areas: VRF SCoP = 3.8 VRF SEER = 4.50  WC's & stairs: Direct electric radiator	VRF SCoP = 3.8 VRF SEER = 4.50
Lighting Inputs	Offices and labs: 1.3W/m²/100lx  Other areas: 100lm/W	All areas: 100lm/W	Office areas: 1.3W/m²/100lx  Other areas: 100lm/W	>60lm/W
Lighting Controls	Labs, Write-up/offices, meeting rooms Man-on Auto-off, with daylight dimming in perimeter areas.	Offices Man-on Auto-off, with daylight dimming in perimeter areas.  WCs, circulation Auto-on-off	Open plan offices Auto-on-off, with daylight dimming in perimeter areas	

	Labs (Phase 1)	Student Resi (Phase 2)	Office areas (Ph 2 & 3)	Retail (Ph 1, 2 & 3)
	WCs, circulation Auto-on-off	Other areas (incl. bedrooms) Manual on off	Cell offices, meeting rooms Man-on Auto-off, with daylight dimming in perimeter areas.  WCs, circulation Auto-on-off	
Ventilation	AHU with SFP of 1.6 W/(l/s) 75% heat recovery Demand controlled VAV with CO₂ sensors	Student bedrooms: Nat vent  Offices/landlord areas MVHR with SFP of 1.6 W/(l/s) 75% heat recovery  Bathrooms/WC's Extract only from local fan with SFP of 0.3 W/(l/s)	Office areas, reception, meeting rooms: AHU with SFP of 1.6 W/(l/s) 75% heat recovery Demand controlled VAV with CO₂ sensors  WC's: Extract only from remote fan with SFP of 0.5 W/(l/s)	MVHR with SFP of 1.6 W/(l/s) 75% heat recovery  Kitchen (A3 retail): Supply & extract with SFP of 2.0 W/(l/s) Heat recovery 50%
DHW	High temperature ASHP SCOP: 2.6	ASHP pre-heat to 40°C (60% of the load) + direct electric top-up to 60°C (40% of the load)  ASHP SCOP: 3.2	Point of use direct electric	Point of use direct electric
Metering & Controls	Metering for at least 90% of end use energy use. Lighting auto monitoring & targeting with alarms for out of range values.			
Power Factor Correction	>0.95			
Pipe & Ductwork Insulation	To be provided in accordance with the Building Regulations.			
O&M Manuals	To be provided in accordance with the Building Regulations.			

Table 6 System performance parameters per use type.



## Appendix C: BREEAM Pre-assessment summary

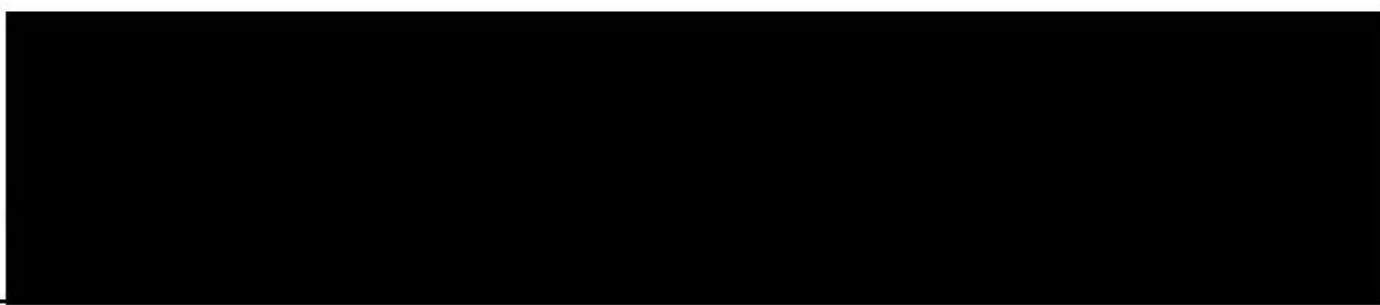







## QA

### Clarendon Centre - BREEAM Pre-Assessment

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## 1.0 INTRODUCTION & SUMMARY

- 1.1 Greengage Environmental Ltd were commissioned by Lothbury (the 'applicant') to undertake this BREEAM Pre-Assessment for the development of the Clarendon Centre mixed use development in Oxford.
- 1.2 The proposed development is a mixed-use part new-build, part refurbishment development in Oxford. The works are split into distinct phases and building types including office, retail and student accommodation.
- 1.3 Most of the development is targeting an 'Excellent' rating under the appropriate BREEAM scheme in line with policy RE1 within the Oxford City Council Local Plan 2036 (Adopted June 2020), which requires this to be achieved for all developments over 1,000m<sup>2</sup>. The retail aspects of the development are targeting a 'Very Good' rating following discussions with the Energy Officer as their shell-only nature prohibits higher standards being achieved.
- 1.4 This BREEAM Pre-Assessment report presents a framework of credits to target the following scores, equating to the required BREEAM ratings:
- Phase 1 offices: 74.03% - Excellent;
  - Phase 1 retail: 64.29% - Very Good;
  - Phase 2 student accommodation: 73.00% - Excellent;
  - Phase 2 office: 73.08% - Excellent; and
  - Phase 2 retail: 59.03% - Very Good.
- 1.5 The assessment strategy is summarised within **Section 3.0** of this report and the full detail is provided within **Appendix A**.



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## 2.0 BREEAM

- 2.1 The Building Research Establishment's Environmental Assessment Method (BREEAM) is a nationally recognised means of reviewing and improving the environmental performance of buildings.
- 2.2 The BREEAM UK New Construction 2018 & Refurbishment & Fit-Out 2014 schemes can be used to assess the environmental life cycle impacts of new and refurbished non-domestic buildings at the design and construction stages. The proposed Phase 1 office, Phase 1 retail and Phase 2 student accommodation are classed as 'New Construction' as they are new buildings with only the structural frame of the existing building retained and extended. The Phase 2 retail and offices are classed as refurbishment projects.
- 2.3 Used as a design tool, BREEAM will assess the environmental performance of new build buildings and refurbishments, providing a framework for improvement and an auditable demonstration of good design practice.

### BREEAM CATEGORIES

- 2.4 BREEAM considers key global and local environmental issues and the internal environment for building occupants under various categories, covering:
- **Management** – rewards good construction site practices, provision of information to building occupants and project management;
  - **Health & Wellbeing** – promotes a healthy internal and external environment;
  - **Energy** – rewards energy efficiency and renewable energy generation;
  - **Transport** – encourages locations with good access to and improvement of sustainable transport options;
  - **Water** – promotes water efficiency and water recycling;
  - **Materials** – rewards the lifecycle consideration and responsible sourcing of materials;
  - **Waste** – encourages good construction and operational waste management practices;
  - **Land Use & Ecology** – encourages ecological enhancements; and
  - **Pollution** – promotes measures to reduce air and water pollution.



## BREEAM RATINGS

- 2.5 BREEAM rating benchmarks, as set out below, enable comparison of building performance against typical sustainability standards.

**Table 2.1 BREEAM Ratings and Percentage Score**

Rating	Percentage Score
UNCLASSIFIED	<30%
PASS	≥30%
GOOD	≥45%
VERY GOOD	≥55%
EXCELLENT	≥70%
OUTSTANDING	≥85%

- 2.6 It is recommended that a score of around 3-4% above the minimum score is aimed for during the design stages and achieved at the final certification stage. This is to ensure that if a credit was lost or disputed and revoked during design progression or third party BRE certification, the target rating would still be robustly achieved.

## MINIMUM RATING REQUIREMENT CREDITS

- 2.7 Under certain categories, there are minimum credit requirements that must be achieved before a particular BREEAM rating can be awarded. All other credits are flexible.
- 2.8 The following minimum standards are required to reach the targeted ratings:

**Table 2.2 BREEAM New Construction 2018 minimum standards**

Credit	Minimum standard	Minimum standard level applicable for
Man 03: Responsible construction practices	One credit - Responsible construction management	Excellent
Man 04: Commissioning and handover	Commissioning – testing schedule and responsibilities	Very Good
Man 04: Commissioning and handover	Criterion 11 - Building User Guide	Very Good



Man 05: Aftercare	One credit – Commissioning implementation	Excellent
Ene 01: Reduction of energy use and carbon emissions	Four credits – Energy performance or prediction of operational energy consumption	Excellent
Ene 02: Energy monitoring	One credit - First sub-metering credit	Very Good
Wat 01: Water consumption	One credit	Good
Wat 02: Water monitoring	Criterion 1 only	Good
Mat 03: Responsible sourcing of materials	Criterion 1 only	Pass
Wst 03: Operational waste	One credit	Excellent

**Table 2.3 BREEAM Refurbishment & Fit-Out 2014 minimum standards**

Credit	Minimum standard	Minimum standard level applicable for
Man 03: Responsible construction practices	One credit – considerate construction	Excellent
Man 04: Commissioning and handover	Criterion 9 – Building User Guide	Excellent
Man 05: Aftercare	One credit – seasonal commissioning	Excellent
Ene 01: Reduction of energy use and carbon emissions	Six credits	Excellent
Ene 02: Energy monitoring	One credit - first sub-metering credit	Very Good
Wat 01: Water consumption	One credit	Good
Wat 02: Water monitoring	Criterion 1 only	Good
Mat 03: Responsible sourcing of materials	Criterion 1 only	Pass
Wst 03: Operational waste	One credit	Excellent



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### 3.0 DEVELOPMENT PERFORMANCE

3.1 The proposed development has been assessed as five separate assessments against the following methodologies and use classes:

- Phase 1 office: New Construction 2018, fully fitted, office;
- Phase 1 retail: New Construction 2018, shell only, retail;
- Phase 2 student accommodation: New Construction 2018, fully fitted, residential institution (long term stay);
- Phase 2 office: Refurbishment & Fit-Out 2014, Parts 1-3, office; and
- Phase 2 retail: Refurbishment & Fit-Out 2014, Part 1, retail.

3.2 The pre-assessment BREEAM scores and ratings that are targeted for the buildings are detailed below, and include all required minimum standards:

- Phase 1 offices: 74.03% - Excellent;
- Phase 1 retail: 64.29% - Very Good;
- Phase 2 student accommodation: 73.00% - Excellent;
- Phase 2 office: 73.08% - Excellent; and
- Phase 2 retail: 59.03% - Very Good.

3.3 As shown in Table 2.1, the percentage scores required for a BREEAM 'Excellent' and 'Very Good' rating are 70% and 55% respectively. The scores above are therefore above these thresholds and incorporate the recommended 3-4% buffer. It is anticipated that further credits will be reviewed and targeted where feasible at the detailed design stages.

3.4 A summary of the current pre-assessment BREEAM strategies is shown in the tables below. A detailed breakdown of the targeted BREEAM credits is presented in **Appendix A** of this report. These represent one possible strategy to achieve the required BREEAM rating but credits will be continually reviewed and alternatives may be sought as deemed more appropriate as the design progresses.



**Table 3.1 Summary of BREEAM Category Scores – Phase 1 office**

BREEAM category	Credits available	Credits targeted	Weighting (%)	Category score (%)
Management	21	16	11.00	8.38
Health & Wellbeing	18	16	14.00	12.44
Energy	23	10	16.00	6.96
Transport	12	6	10.00	5.00
Water	9	8	7.00	6.22
Materials	14	11	15.00	11.79
Waste	11	9	6.00	4.91
Land Use & Ecology	13	12	13.00	12.00
Pollution	12	8	8.00	5.33
Innovation	10	1	10.00	1.00
<b>TOTAL</b>				<b>74.03%</b>
<b>TARGETED RATING</b>				<b>EXCELLENT</b>

**Table 3.2 Summary of BREEAM Category Scores – Phase 1 retail**

BREEAM category	Credits available	Credits targeted	Weighting (%)	Category score (%)
Management	15	11	12.00	8.80
Health & Wellbeing	8	4	7.00	3.50
Energy	13	1	9.50	0.73
Transport	12	4	14.50	4.83
Water	2	2	2.00	2.00
Materials	14	11	22.00	17.29
Waste	10	7	8.00	5.60
Land Use & Ecology	13	12	19.00	17.54
Pollution	6	4	6.00	4.00
Innovation	10	0	10.00	0.00



<b>TOTAL</b>	<b>64.29%</b>
<b>TARGETED RATING</b>	<b>VERY GOOD</b>

**Table 3.3 Summary of BREEAM Category Scores – Phase 2 student accommodation**

<b>BREEAM category</b>	<b>Credits available</b>	<b>Credits targeted</b>	<b>Weighting (%)</b>	<b>Category score (%)</b>
Management	21	16	11.00	8.38
Health & Wellbeing	19	16	14.00	11.79
Energy	22	9	16.00	6.55
Transport	12	5	10.00	4.17
Water	8	7	7.00	6.13
Materials	14	12	15.00	12.86
Waste	10	8	6.00	4.80
Land Use & Ecology	13	12	13.00	12.00
Pollution	12	8	8.00	5.33
Innovation	10	1	10.00	1.00
<b>TOTAL</b>				<b>73.00%</b>
<b>TARGETED RATING</b>				<b>EXCELLENT</b>

**Table 3.4 Summary of BREEAM Category Scores – Phase 2 office**

<b>BREEAM category</b>	<b>Credits available</b>	<b>Credits targeted</b>	<b>Weighting (%)</b>	<b>Category score (%)</b>
Management	21	16	14.50	11.05
Health & Wellbeing	15	8	12.36	6.59
Energy	24	14	16.70	9.74
Transport	9	9	7.25	7.25
Water	8	7	6.44	5.64
Materials	13	12	15.11	13.95



Waste	11	8	8.31	6.04
Land Use & Ecology	3	3	7.25	7.25
Pollution	13	6	12.08	5.58
Innovation	10	0	10.00	0.00
<b>TOTAL</b>				<b>73.08%</b>
<b>TARGETED RATING</b>				<b>EXCELLENT</b>

**Table 3.5 Summary of BREEAM Category Scores – Phase 2 retail**

<b>BREEAM category</b>	<b>Credits available</b>	<b>Credits targeted</b>	<b>Weighting (%)</b>	<b>Category score (%)</b>
Management	15	11	13.87	10.17
Health & Wellbeing	13	3	14.34	3.31
Energy	17	8	15.83	7.45
Transport	9	8	9.71	8.63
Water	0	0	0.00	0.00
Materials	13	12	20.22	18.66
Waste	10	7	10.11	7.08
Land Use & Ecology	3	3	9.71	9.71
Pollution	5	3	6.22	3.73
Innovation	10	0	10.00	0.00
<b>TOTAL</b>				<b>59.03%</b>
<b>TARGETED RATING</b>				<b>VERY GOOD</b>



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## 4.0 DISCUSSION

- 4.1 This BREEAM Pre-Assessment report has set out a pathway to show how the buildings withing the proposed development could achieve the required 'Excellent' or 'Very Good' ratings. The proposed strategies currently achieve the required scores and provides the required buffer over the scoring threshold.
- 4.2 The strategies proposed represent one potential pathway to achieving the required ratings. Credits will be continually reviewed as the design progresses and may change accordingly, whilst maintaining the overall target rating.
- 4.3 Key actions required at the early project stages have been identified and appointments made where necessary to ensure the required credits can be achieved.
- 4.4 Following this Pre-Assessment report, a BREEAM Design Stage and eventually Post-Construction Stage Assessment would be required in order to gain full BREEAM certification.
- 4.5 Appendix A provides the detailed BREEAM credit assumptions for the proposed development.



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## **APPENDIX A - DETAILED CREDIT ASSUMPTIONS**



BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name	Clarendon Centre	
Project Number	551564	
Date	17/12/2020	
Targeted BREEAM Rating	EXCELLENT	74.03%


<b>Project Notes:</b> BREEAM 2018 New Construction <b>OFFICE (LABS)</b> <b>FULLY FITTED</b>	
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Category	Credit ID	Credit Name	Credit(s) Available	Proposed Scenario	Responsibility	Time critical	Credit Issue
	Man 01	Project Brief and Design	1	1	Architect/Project Manager	Concept Design	<b>Project Delivery Consultation</b> A meeting(s) undertaken between key project delivery stakeholders/project team, identifying roles, responsibilities and contributions for key phases of project delivery.
			1	1	Project manager / Planning Consultant	Concept Design - Technical Design	<b>Stakeholder Consultation (third parties)</b> - All relevant interested parties (building users, existing community, partnerships and networks) have been consulted by the design team. - Stakeholder contributions and consultation outcomes have influenced Initial Project Brief and Concept Design. - Consultation feedback has been given to, and received by, all relevant parties prior to completion of detailed design.
			1	1	Client / BREEAM AP	Concept Design	<b>BREEAM AP (Concept Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. AP appointed to work with team to maximise project's performance against BREEAM throughout Concept Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
			1	1	Client / BREEAM AP	Concept Design & Developed Design	<b>BREEAM AP (Developed Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. BREEAM AP (Concept Design) credit must be achieved first. AP is appointed to work with team to maximise project's performance against BREEAM throughout Developed Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
	Man 02	Life cycle cost and service life planning	2	0	Cost Consultants/ Client	Concept Design	<b>Elemental Life Cycle Cost (LCC)</b> Outline entire asset elemental life cycle cost plan carried out.
			1	0		Technical Design	<b>Component level life cycle costing (LCC)</b> In line with PD 156865:2008 & includes (where present): - Envelope, e.g. cladding, windows, and/or roofing - Services, e.g. heat source cooling source, and/or controls - Finishes, e.g. walls, floors and/or ceilings - External spaces, e.g. alternative hard landscaping, boundary protection.  Examples of how the LCC has influenced the design must be given.
			1	1			<b>Capital Cost Reporting</b> Report capital cost in £/sqm GIFA. (Predicted cost at design stage and confirmation at PC) Capital cost includes construction (inc. prep, materials, equipment, labour); site management; construction financing; insurance & taxes; inspection & testing
			✓	✓			<b>Pre-requisite - All timber and timber-based products used during construction are 'legal and sustainable timber'.</b>
			1	1			<b>Environmental Management</b> All parties who control the site site (principal contractor, demo-contractor) operate EMS (ISO14001 or equivalent) for all main operations and best practice pollution prevention in accordance with Pollution Prevention Guidelines PPG6.




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div> <div></div>				
Project Number		551564						
Date		17/12/2020						
Targeted BREEAM Rating		EXCELLENT	74.03%					
Management	Man 03	Responsible construction practices	1	1	Contractor	Construction	<b>BREEAM AP (site)</b> Pre-requisite: Client and contractor formally agree performance targets. BREEAM AP is appointed to assist with maximising performance, go beyond design intent, monitor progress against targets, identify risks/opportunities, provide feedback, coordinate generation of evidence.	
			2	2			<b>Responsible construction management</b> One credit - achieve applicable items in responsible construction management table Two credits - achieve the above plus six additional items Table items include: vehicle movement, pollution management, tidiness, health & wellbeing, security, training and reporting. CCS will cover majority of the above	
			2	2			<b>Monitoring of Construction Site Impacts</b> Individual appointed to record the utility consumption (energy & water) and transport of construction materials & waste to/from site. Targets must be set and monitored.	
	Man 04	Commissioning and handover	✓	✓			<b>Mandatory - Provision of a Building User Guide (BUG)</b>	
			1	1	Contractor / M&E		<b>Commissioning - Testing Schedule and Responsibilities</b> - Commissioning schedule including suitable timescale for commissioning/ re-commissioning of all complex/ non-complex building services and control systems and testing and inspecting building fabric. - Commissioning activities carried out in accordance with current Building Regs, BSRIA, CIBSE guidelines. - Appoint team member to monitor and programme pre-commissioning, commissioning, testing activities - Contractor accounts for the commissioning within their budget and timeline.	
			1	1	Contractor / M&E		<b>Commissioning - design and preparation</b> Appoint appropriate project team member (by either the client or the principal contractor) to undertake design reviews, give advice, provide commissioning management input during installation and performance testing during handover.	
			1	0	Contractor / M&E		<b>Testing and inspecting building fabric</b> Thermographic survey and airtightness testing.	
			1	1	Contractor / M&E		<b>Handover</b> Develop two BUGs and two Training Schedules: 1) Non-technical for distribution to building occupiers; and 2) Technical for FMs.	
	Man 05	Aftercare	1	1	Client		<b>Aftercare Support</b> - Operational infrastructure in place to provide aftercare support to the occupier including, meetings with the occupier, on-site facilities training and walkabout, weekly attendance on-site for first month, longer term availability for 12 months. - Monitor energy and water consumption for 12 months	
			1	1	Client		<b>Commissioning - implementation (Mandatory Excellent)</b> - Over a 12 month period - Full load and part load, summer and winter as appropriate - Interviews with building occupants where affected - Monthly reports comparing sub-metered energy performance to predicted one - Re-commissioning systems and incorporating any revisions into the O&M manuals	




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div> <div></div>			
Project Number		551564					
Date		17/12/2020					
Targeted BREEAM Rating		EXCELLENT	74.03%				
			1	0	Client		<div>Post Occupancy Evaluation (POE)</div> <div>3rd party POE one year after occupation including a review of the design intent and construction process as well as feedback from building users on the environmental conditions of the building. Independent party provides report with lessons learned. Client or occupier commits funds to pay for POE in advance.</div>
	0.52%	Total Credit	21	16			
	Per Credit	Section Score	11.00%	8.38%			
	Hea 01	Visual Comfort	1	1	Architect/ M&E		<div>Control of glare from sunlight</div> <div>Glare control assessment to identify risk areas</div> <div>Glare control strategy for all relevant areas</div> <div>- Blinds</div> <div>- Building Integrated measures</div> <div>- Bioclimatic Control</div> <div>- External shading or brise soleil</div> <div>Strategy must not increase energy consumption from lighting, therefore curtains are non-compliant.</div>
			2	2			<div>Daylighting</div> <div>2% daylight factor across 80% NIFA.</div>
			1	0			<div>View Out</div> <div>95% of floor area in 95% of spaces is within 8m of an external wall with window providing adequate view out and window/opening must be ≥ 20% of the surrounding wall area.</div>
			1	1			<div>Internal and External lighting levels, Zoning and Controls (External lighting only for shell only)</div> <div>-External lighting to required illuminance levels (where applicable) including SLL Code for Lighting, CIBSE Lighting Guide 5 &amp; 7 and BS EN 12464.</div>
	Hea 02	Indoor Air Quality	✓	✓	Air Quality Specialist		<div>Pre-requisite: Indoor Air Quality Plan</div> <div>Consideration of:</div> <div>-removal of contaminant sources</div> <div>-dilution and control of contaminant sources</div> <div>-procedures for pre-occupancy flush out</div> <div>-third party testing and analysis</div> <div>-maintaining indoor air quality in use</div>
			1	1	Air Quality Specialist / M&E		<div>Ventilation</div> <div>Ventilation pathways minimise build-up of air pollutants.</div> <div>Air intakes must be 10m horizontal distance from building exhausts and other external sources of pollution.</div> <div>HVAC systems incorporate suitable filtration.</div> <div>Variable occupancy areas have CO2 sensors linked to mechanical ventilation system.</div>
			2	2			<div>Emissions from construction products</div> <div>One credit: 3 of 5 product types meet emission limits/testing criteria plus wood products</div> <div>Two credits: all product types meet emission limits/testing criteria</div>




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div>					<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT	74.03%							
Health and Wellbeing			1		0		M&E		<b>Post construction indoor air quality measurement</b> Formaldehyde concentration in indoor air does not exceed WHO guidelines. TVOC concentration does not exceed specified limits.	
	Hea 04	Thermal comfort	1		1		M&E		<b>Thermal Modelling</b> Thermal modelling carried out using full dynamic thermal analysis software in accordance with CIBSE AM11. Building designed for over heating in accordance with CIBSE TM52. Meets CIBSE Guide A Table 1.5 for winter temperatures. PMV & PPD reported for air conditioned buildings.	
			1		1				<b>Design for future thermal comfort</b> Thermal modelling demonstrates that the building design and services strategy delivers same thermal comfort levels, PMV and PPD indices as for the first credit under a projected climate change environment.	
			1		1				<b>Thermal Zoning and Controls</b> Thermal modelling has informed the temperature control strategy The strategy addresses appropriate zones for heating and cooling, degree of occupant control required, interaction of these systems and potential for manual override of automatic systems.	
	Hea 05	Acoustic performance	3		3		Acoustician		<b>Indoor Ambient Noise</b> The building meets the appropriate acoustic performance standards and testing requirements for the building type. Indoor ambient noise in line with Section 7 of BS 8233:2014. OR Acoustician defines a bespoke set of performance criteria for indoor ambient noise.  Note for shell only: A Suitably Qualified Acoustician (SQA) must carry out a quantifiable assessment of the specification of the built form, construction and any external factors that are likely to affect the indoor ambient noise levels. From this assessment, the SQA must confirm that the developer's scope of works will enable a future tenant utilising a typical fit-out and specification to meet the levels required to demonstrate compliance with the BREEAM criteria.	
	Hea 06	Security	1		1		Architect	Concept Design	<b>Security of Site and Building</b> - Suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) including visual audit and the recommendations implemented.	
	Hea 07	Safe and healthy surroundings	1		1		Architect		<b>Safe access</b> Dedicated cycle paths Dedicated/safe footpaths Pedestrian drop off areas providing direct access to footpaths Delivery areas not accessed through general parking areas. Dedicated parking/waiting area for goods vehicles separate to manoeuvring area Parking/turning designed for simple manoeuvring.	
			1		1		Architect		<b>Outside space</b> Providing building users with external amenity area - outdoor, landscaped, appropriate seating, non-smoking, avoids noise disturbance.	
		0.78%	Total Credit	18		16				
	Per Credit	Section Score	14.00%		12.44%					




## BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre			<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div> <div></div>				
Project Number		551564							
Date		17/12/2020							
Targeted BREEAM Rating		EXCELLENT		74.03%					
Energy	Ene 01	Reduction of Energy Use and Carbon Emissions	9		4		M&E		<b>Energy Performance</b> Based on energy performance BRUKL document <b>Minimum 4 credits for Excellent</b>
			4		0		M&E		<b>Prediction of operational energy consumption</b> Pre-requisite: Preliminary design workshop on operational energy performance Additional energy modelling to generate predicted operational energy consumption figures. Risk assessment carried out.
	Ene 02	Energy Monitoring	1		1		M&E		<b>Mandatory - Sub-metering of end-use categories</b> Labelling required for each output: Space heating, DHW, cooling, ventilation, lighting, small power, pumps, renewables, others. Pulsed output BMS for buildings over 1000sqm
			1		1		M&E		<b>Sub-metering of high energy load and tenancy areas</b> Accessible energy monitoring and management system for tenanted areas or relevant function areas or separate sub-meters.
	Ene 03	External Lighting	1		1		M&E		<b>External Lighting</b> Average initial luminous efficacy of external light fittings is not less than 70 luminaire lumens per circuit Watt. External light fittings automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.
	Ene 04	Low Carbon Design	1		0		M&E	Concept Design	<b>Passive Design Analysis</b> Thermal modelling credit items to be achieved as pre-requisite Identify opportunities for passive design solutions by Concept Design stage Implement passive design measures and quantify reduced total energy demand and CO2 emissions
			1		0			Concept Design	<b>Free Cooling</b> Analysis of free cooling and implementation opportunities within passive design analysis
			1		1			Concept Design	<b>Low Zero Carbon Feasibility Study</b> LZC study by energy specialist. LZC technology specified in line with feasibility study. Quantify reduced regulated CO2 emissions.




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div>					<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT	74.03%							
	Ene 06	Energy Efficient Transportation Systems	1	1	Lift Consultants		<b>Energy Consumption</b> The energy consumption has been calculated in accordance with BS EN ISO 25745 Energy performance of lifts systems with the lowest energy consumption is specified.			
			1	1			<b>Energy Efficient Features - energy consumption credit is achieved</b> Lifts must be specified to operate in standby condition during off-peak periods, compliant lighting (> 55 lamp lumens/circuit Watt.), compliant drive controller AND use of regenerative drive demonstrates energy reduction.			
	Ene 08	Energy Efficient Equipment	2	0	Operator		<b>Unregulated Energy</b> - Identify the buildings unregulated energy loads and estimate their contribution to the total annual unregulated energy demand. - Identify the systems that use a significant proportion of the buildings unregulated energy consumption. - Demonstrate a meaningful reduction in this energy consumption through appropriate specification.			
	0.70%	Total Credit	23	10						
	Per Credit	Section Score	16.00%	6.96%						
Transport	Tra 01	Transport assessment and travel plan	2	2	Transport consultant		<b>Travel Plan</b> Developing a travel plan, based upon the findings set out within a travel assessment/statement, incorporating the sustainable measures into the design.			
	Tra 02	Sustainable transport measures	10	4	Transport consultant / Architect		<b>Transport options implementation</b> Tra 01 is pre-requisite Identify sustainable transport options, award credits based on AI and number of options. Measures include - cycle storage, cycle facilities, existing amenities, existing AI.			
	0.83%	Total Credit	12	6						
	Per Credit	Section Score	10.00%	5.00%						
Water	Wat 01	Water Consumption	5	4	M&E/ Architect		<b>Mandatory 1 credit for 12.5% improvement</b> 1 credit - 12.5% improvement over baseline performance- litres/person/day. 2 credits - 25% improvement over baseline performance- litres/person/day. 3 credits - 40% improvement over baseline performance- litres/person/day. 4 credits - 50% improvement over baseline performance- litres/person/day . 5 credits - 55% improvement over baseline performance- litres/person/day.  >3 credits requires the implementation of greywater/rainwater recycling.			
	Wat 02	Water Monitoring	1	1	M&E		<b>Water meter</b> - Specification of water meter on mains supply to each building - Pulsed water meter to enable BMS connection			




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div>				<div></div>	
Project Number		551564							
Date		17/12/2020							
Targeted BREEAM Rating		EXCELLENT	74.03%						
Water	Wat 03	Water Leak Detection	1		1		M&E		<b>Leak Detection System</b> Leak detection system capable of detecting major leak on mains.
			1		1			<b>Flow Control Devices</b> Sanitary supply shut-off. Flow control devices fitted to each WC area/facility to ensure water is supplied only when needed.	
	Wat 04	Water efficient equipment	1		1		M&E		<b>Water efficient equipment</b> Identify water demands that can be realistically mitigated or reduced. Identify systems or processes to reduce relevant water demand
	0.78%	Total Credit	9		8				
	Per Credit	Section Score	7.00%		6.22%				
Materials	Mat 01	Environmental impacts from construction products - Building life cycle assessment (LCA)	6		5		Architect	Prior to planning application	<b>Superstructure</b> Building LCA options appraisal of 2-4 significantly different superstructure design options & comparison to benchmark at Concept Design, submit prior to planning application Building LCA options appraisal of 2-3 significantly different superstructure design options & comparison to benchmark at Technical Design.
			1		0		Architect	Prior to planning application	<b>Substructure and hard landscaping options appraisal during Concept Design</b> LCA options appraisal on a combination of at least 6 different substructure or hard landscaping design options (at least 2 of each). Submit prior to planning application.
	Mat 02	Environmental impacts from construction products - Environmental Product Declarations (EPD)	1		0		Architect		<b>Specification of products with a recognised environmental product declaration (EPD)</b> Total EPD points score of at least 20
	Mat 03	Responsible sourcing of construction products	✓		✓		Architect/ Contractor		<b>Mandatory - Pre-requisite - All timber used must be 'legal' and 'sustainable' as per UK Government Timber Procurement Policy"</b>
			1		1			Concept Design	<b>Enabling Sustainable Procurement</b> Contractor sources materials in accordance with a Sustainable Procurement Plan (SPP).
			3		3			<b>Responsible Sourcing of Materials</b> One credit - Superstructure & >10% of points Two/three credits - internal finishes and substructure & hard landscaping & >20% or >30%	
	Mat 05	Designing for Durability and Resilience	1		1		Architect		<b>Protecting Vulnerable Parts of the Building from Damage.</b> Design and specification measures to limit material degradation due to accidental/malicious damage.  <b>Protecting exposed parts of the building from material degradation</b> Exposed building elements designed to limit degradation due to environmental factors through appropriate quality standard or a detailed assessment of the element's resilience. Convenient access to roof and facade for cleaning/repair and design roof to prevent water damage/ingress.
	Mat 06	Material Efficiency	1		1		Architect/ Contractor	All design stages from Preparation & Brief	<b>Material Efficiency</b> Opportunities and measures to optimise the use of materials in building design, procurement, construction, maintenance and end of life have been identified. Measures must be implemented and targets/actual material efficiencies achieved reported.
	1.07%	Total Credit	14		11				
	Per Credit	Section Score	15.00%		11.79%				




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div> <div></div>					
Project Number		551564							
Date		17/12/2020							
Targeted BREEAM Rating		EXCELLENT	74.03%						
Waste	Wst 01	Construction Waste Management	1		1		Demolition contractor / Architect	Concept Design	<b>Pre-demolition audit</b> Pre-demo audit carried out at Concept Design and referred to in RMP.
			3		2		Contractor		<b>Construction Resource Efficiency -</b> Construction Resource Management Plan (CRMP) ≤7.5m3 (≤6.5 tonnes) per 100 sqm GIFA of non-hazardous construction waste generated.
			1		1			<b>Diversion of Waste from Landfill</b> Non-Demo - 70% Volume / 80% Tonnage Demolition - 80% Volume / 90% Tonnage	
	Wst 02	Use of recycled and sustainably sourced aggregates	1		1		Contractor / Structural Engineer		<b>Project sustainable aggregate points</b> Pre-requisite - pre-demo audit if applicable. Identify all aggregates including quantity, source, distance travelled.
	Wst 03	Operational Waste	1		1		Architect		<b>Operational waste</b> Dedicated space to cater for segregation and storage of operational recyclable waste volumes generated. Space is clearly labelled, accessible, of appropriate capacity
	Wst 04	Speculative Finishes	1		1				<b>Speculative floor and ceiling finishes</b> Offices only Finishes in show area only unless specified by tenant
	Wst 05	Adaptation to Climate Change	1		1		Architect / M&E / Structural Engineer	Concept Design & Technical Design	<b>Resilience of structure, fabric, building services and renewables installation</b> Climate change adaptation strategy appraisal Develop recommendations based on appraisal Provide update during technical design on implementation of recommendations
	Wst 06	Design for disassembly and adaptability	1		1		Architect / Structural Engineer	Concept Design	<b>Design for disassembly and functional adaptability - recommendations</b> - Study to explore ease of disassembly and functional adaptation potential of different designs - Develop recommendations and solutions by end of Concept Design




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div> <div></div>				
Project Number		551564						
Date		17/12/2020						
Targeted BREEAM Rating		EXCELLENT	74.03%					
	WST 00	Design for disassembly and adaptability	1	0	Architect / Structural Engineer	Concept Design	<b>Disassembly and functional adaptability - implementation</b> Update during Technical Design on implementation of recommendations or solutions and any changes. Produce building adaptability and disassembly guide for prospective tenants.	
	0.55%	Total Credit	11	9				
	Per Credit	Section Score	6.00%	4.91%				
Land Use and Ecology	LE 01	Site Selection	1	1	Architect		<b>Previously occupied land</b> At least 75% of the proposed development's footprint on an area of land which has previously been developed.	
			1	0	Contaminated Land Specialist		<b>Contaminated Land</b> Land deemed to be contaminated and subsequently remediated	
	LE 02	Ecological risks and opportunities	2	2	Ecologist	Preparation & Brief	<b>Survey and evaluation</b> Pre-requisite - assessment route determined using GN34. Compliance against legislation monitored. Survey & evaluation by ecologist to determine baseline and ecological outcomes.	
	LE 03	Managing impacts on ecology	1	1	Ecologist	Concept Design	<b>Planning and measures on-site</b> Roles & responsibilities defined. Site preparation to optimise benefits. Collaboration with stakeholders, solutions implemented.	
			2	2	Ecologist	Concept Design	<b>Managing negative impacts</b> Negative impacts from construction managed according to hierarchy (2 credits = no overall loss of ecological value).	
	LE 04	Ecological change and enhancement	1	1	Ecologist / Contractor	Concept Design	<b>Ecological enhancement</b> Stakeholder liaison solutions and measures implemented in a way that enhances ecological value on site as priority. Data provided to local environmental records centre	
			3	3		Concept Design	<b>Change and enhancement of ecology</b> Calculate change in ecological value to award credits	
	LE 05	Long term ecology management and maintenance	1	1	Ecologist / Contractor		<b>Management and maintenance throughout the project</b> Parts of LE04 are pre-requisite. Monitoring and reporting on project outcomes. Section on ecology in tenant/building owner information	
			1	1	Ecologist		<b>Landscape and ecology management plan</b> Plan developed in accordance with BS 42020:2013 covering first five years after completion.	
	1.00%	Total Credit	13	12				
	Per Credit	Section Score	13.00%	12.00%				




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre			<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div>				<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT		74.03%						
Pollution	Pol 01	Impact of Refrigerants	2	1	M&E		<b>Pre-requisite- compliance with BS EN 378:2016 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice.</b>			
							<b>Impact of refrigerant</b> 2 credits: Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELCO2e) of ≤ 100 kgCO2e/kW cooling/heating capacity OR all refrigerants used have GWP <10. 1 Credit : Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELCO2e) of ≤ 1000 kgCO2e/kW cooling/heating capacity.			
		1	0			<b>Leak Detection</b> Refrigerant leak detection system installed or the system is Hermetically sealed.				
	Pol 02	Local air quality	2	2	M&E		<b>Local air quality</b> Combsution plant emissions from plant providing space heating and doemstic hot water do not exceed required levels in table.			
	Pol 03	Flood and surface water management	2	2	Flood / Drainage Consultant		<b>Pre-requisite - appropriate consultant appointed</b> <b>Flood Resilience</b> 2 Credits for low flood risk <u>or</u> 1 Credit for medium / high flood risk			
			2	1			<b>Surface water run-off</b> <b>Pre-requisite- bespoke surface water run-off design solutions</b> - Peak rate of run-off has 30% improvement for developed site compared to pre-developed for 1 and 100 yr return events. Include climate change allowance. (1 credit) - Flooding of property will not occur in the event of local drainage system failure and use of SuDS to ensure post development runoff volume no greater than pre-development. (1 credit)			
			1	0			<b>Minimising Water Course Pollution</b> No discharge from site for rainfall up to 5mm. Appropriate level of pollution prevention using SuDS. Oil separators.			
	Pol 04	Reduction of Night Time Light Pollution	1	1	M&E		<b>Night Time Light Pollution</b> External lighting strategy designed in compliance with ILP Guidance Notes for the Reduction of Obtrusive Light, 2011. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.			
	Pol 05	Reduction of Noise Pollution	1	1	Acoustician		<b>Acoustic Report</b> Noise impact assessment in compliance with BS 4142:2014. Noise from assessed building 5dB lower than background noise.			
		0.67%	Total Credit	12	8					
	Per Credit	Section Score	8.00%	5.33%						
	Man 03	Responsible Construction Practices	1	0	Contractor					
	Hea 01	Visual comfort	2	0	M&E					
	Hea 02	Indoor air quality	1	0						
	Hea 06	Security	1	0						
	Ene 01	Reduction of energy use and carbon emissions	5	0						
	Wat 01	Water consumption	1	0						



BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>OFFICE (LABS)</div> <div>FULLY FITTED</div> <div></div>						
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT	74.03%							
Innovation	Mat 01	Life Cycle Impacts	2		0					
	Mat 03	Responsible Sourcing of Materials	1		0					
	Wst 01	Construction Site Waste Management	1		0					
	Wst 02	Recycled Aggregates	1		0					
	Wst 05	Adaptation to Climate Change	1		0	Energy Modeller / M&E / Architect / Structures				
	LE 02	Identifying and understanding the risks and opportunities for the project	1		0	Ecologist / Landscape Architect / Structures				
	LE 04	Change & enhancement of ecological value	1		1	Ecologist / Landscape Architect				
	1.00%	Total Credit	10		1					
	Per Credit	Section Score	10.00%		1.00%					
Overall Credits			143.00		97.00					
Final BREEAM Score			110.00%		74.03%					
BREEAM Rating			-		EXCELLENT					



BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name	Clarendon Centre	
Project Number	551564	
Date	17/12/2020	
Targeted BREEAM Rating	VERY GOOD	64.29%

<b>Project Notes:</b> BREEAM 2018 New Construction <b>RETAIL PHASE 1</b> <b>SHELL ONLY</b>		
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Category	Credit ID	Credit Name	Credit(s) Available	Proposed Scenario	Responsibility	Time critical	Credit Issue
Management	Man 01	Project Brief and Design	1	1	Architect/Project Manager	Concept Design	<b>Project Delivery Consultation</b> A meeting(s) undertaken between key project delivery stakeholders/project team, identifying roles, responsibilities and contributions for key phases of project delivery.
			1	1	Project manager / Planning Consultant	Concept Design - Technical Design	<b>Stakeholder Consultation (third parties)</b> - All relevant interested parties (building users, existing community, partnerships and networks) have been consulted by the design team. - Stakeholder contributions and consultation outcomes have influenced Initial Project Brief and Concept Design. - Consultation feedback has been given to, and received by, all relevant parties prior to completion of detailed design.
			1	1	Client / BREEAM AP	Concept Design	<b>BREEAM AP (Concept Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. AP appointed to work with team to maximise project's performance against BREEAM throughout Concept Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
			1	1	Client / BREEAM AP	Concept Design & Developed Design	<b>BREEAM AP (Developed Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. BREEAM AP (Concept Design) credit must be achieved first. AP is appointed to work with team to maximise project's performance against BREEAM throughout Developed Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
	Man 02	Life cycle cost and service life planning	2	0	Cost Consultants/ Client	Concept Design	<b>Elemental Life Cycle Cost (LCC)</b> Outline entire asset elemental life cycle cost plan carried out.
			1	0		Technical Design	<b>Component level life cycle costing (LCC)</b> In line with PD 156865:2008 & includes (where present): - Envelope, e.g. cladding, windows, and/or roofing - Services, e.g. heat source cooling source, and/or controls - Finishes, e.g. walls, floors and/or ceilings - External spaces, e.g. alternative hard landscaping, boundary protection.  Examples of how the LCC has influenced the design must be given.
			1	1			<b>Capital Cost Reporting</b> Report capital cost in £/sqm GIFA. (Predicted cost at design stage and confirmation at PC) Capital cost includes construction (inc. prep, materials, equipment, labour); site management; construction financing; insurance & taxes; inspection & testing
			✓	✓			<b>Pre-requisite - All timber and timber-based products used during construction are 'legal and sustainable timber'.</b>
			1	1			<b>Environmental Management</b> All parties who control the site site (principal contractor, demo-contractor) operate EMS (ISO14001 or equivalent) for all main operations and best practice pollution prevention in accordance with Pollution Prevention Guidelines PPG6.



BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name	Clarendon Centre	
Project Number	551564	
Date	17/12/2020	
Targeted BREEAM Rating	VERY GOOD	64.29%


**Project Notes:**  
BREEAM 2018 New Construction  
RETAIL PHASE 1  
SHELL ONLY



	Man 03	Responsible construction practices	1	1	Contractor	Construction	<b>BREEAM AP (site)</b> Pre-requisite: Client and contractor formally agree performance targets. BREEAM AP is appointed to assist with maximising performance, go beyond design intent, monitor progress against targets, identify risks/opportunities, provide feedback, coordinate generation of evidence.
			2	2			<b>Responsible construction management</b> One credit - achieve applicable items in responsible construction management table Two credits - achieve the above plus six additional items Table items include: vehicle movement, pollution management, tidiness, health & wellbeing, security, training and reporting. CCS will cover majority of the above
			2	2			<b>Monitoring of Construction Site Impacts</b> Individual appointed to record the utility consumption (energy & water) and transport of construction materials & waste to/from site. Targets must be set and monitored.




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre			<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>RETAIL PHASE 1</div> <div>SHELL ONLY</div>				<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		VERY GOOD	64.29%							
	Man 04	Commissioning and handover	1		0		Contractor / M&E			<b>Testing and inspecting building fabric</b> Thermographic survey and airtightness testing.
	0.80%	Total Credit	15		11					
	Per Credit	Section Score	12.00%		8.80%					
Health and Wellbeing	Hea 01	Visual Comfort	2		1		Architect/ M&E			<b>Daylighting</b> 2% daylight factor across 80% NIFA. (One credit awarded by default if no office/meeting areas)
			1		1				<b>View Out</b> 95% of floor area in 95% of spaces is within 8m of an external wall with window providing adequate view out and window/opening must be ≥ 20% of the surrounding wall area.	
			1		1			<b>Internal and External lighting levels, Zoning and Controls (External lighting only for shell only)</b> -External lighting to required illuminance levels (where applicable) including SLL Code for Lighting, CIBSE Lighting Guide 5 & 7 and BS EN 12464.		
	Hea 05	Acoustic performance	1		0		Acoustician		<b>Indoor Ambient Noise</b> The building meets the appropriate acoustic performance standards and testing requirements for the building type. Indoor ambient noise in line with Section 7 of BS 8233:2014. OR Acoustician defines a bespoke set of performance criteria for indoor ambient noise.  Note for shell only: A Suitably Qualified Acoustician (SQA) must carry out a quantifiable assessment of the specification of the built form, construction and any external factors that are likely to affect the indoor ambient noise levels. From this assessment, the SQA must confirm that the developer’s scope of works will enable a future tenant utilising a typical fit-out and specification to meet the levels required to demonstrate compliance with the BREEAM criteria.	
	Hea 06	Security	1		0		Architect	Concept Design	<b>Security of Site and Building</b> - Suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) including visual audit and the recommendations implemented.	
	Hea 07	Safe and healthy surroundings	1		1		Architect		<b>Safe access</b> Dedicated cycle paths Dedicated/safe footpaths Pedestrian drop off areas providing direct access to footpaths Delivery areas not accessed through general parking areas. Dedicated parking/waiting area for goods vehicles separate to manoeuvring area Parking/turning designed for simple manoeuvring.	
			1		0		Architect		<b>Outside space</b> Providing building users with external amenity area - outdoor, landscaped, appropriate seating, non-smoking, avoids noise disturbance.	
	0.88%	Total Credit	8		4					
	Per Credit	Section Score	7.00%		3.50%					
			Reduction of Energy Use and Carbon							<b>Energy Performance</b>




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre			<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>RETAIL PHASE 1</div> <div>SHELL ONLY</div>					<div></div>	
Project Number		551564									
Date		17/12/2020									
Targeted BREEAM Rating		VERY GOOD		64.29%							
Energy	Ene 01	Reduction of Energy Use and Carbon Emissions	9		0		M&E			Based on energy performance BRUKL document <b>Minimum 4 credits for Excellent</b>	
	Ene 03	External Lighting	1		1		M&E			<b>External Lighting</b> Average initial luminous efficacy of external light fittings is not less than 70 luminaire lumens per circuit Watt. External light fittings automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.	
	Ene 04	Low Carbon Design	1		0		M&E	Concept Design		<b>Passive Design Analysis</b> Thermal modelling credit under Hea 04 has been achieved. Identify opportunities for passive design solutions by Concept Design stage Implement passive design measures and quantify reduced total energy demand and CO2 emissions	
			1		0			Concept Design		<b>Free Cooling</b> Analysis of free cooling and implementation opportunities within passive design analysis	
			1		0			Concept Design		<b>Low Zero Carbon Feasibility Study</b> LZC study by energy specialist. LZC technology specified in line with feasibility study. Quantify reduced regulated CO2 emissions.	
	0.73%	Total Credit		13		1					
	Per Credit	Section Score		9.50%		0.73%					
Transport	Tra 01	Transport assessment and travel plan	2		2		Transport consultant			<b>Travel Plan</b> Developing a travel plan, based upon the findings set out within a travel assessment/statement, incorporating the sustainable measures into the design.	
	Tra 02	Sustainable transport measures	10		2		Transport consultant / Architect			<b>Transport options implementation</b> Tra 01 is pre-requisite Identify sustainable transport options, award credits based on AI and number of options. Measures include - existing amenities, existing AI.	
	1.21%	Total Credit		12		4					
	Per Credit	Section Score		14.50%		4.83%					
Water	Wat 02	Water Monitoring	1		1		M&E			<b>Water meter</b> - Specification of water meter on mains supply to each building - Pulsed water meter to enable BMS connection	
	Wat 03	Water Leak Detection	1		1		M&E			<b>Leak Detection System</b> Leak detection system capable of detecting major leak on mains.	



BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>RETAIL PHASE 1</div> <div>SHELL ONLY</div>					<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		VERY GOOD	64.29%							
	1.00%	Total Credit	2		2					
	Per Credit	Section Score	2.00%		2.00%					
Materials	Mat 01	Environmental impacts from construction products - Building life cycle assessment (LCA)	6		5		Architect	Prior to planning application	<b>Superstructure</b> Building LCA options appraisal of 2-4 significantly different superstructure design options & comparison to benchmark at Concept Design, submit prior to planning application Building LCA options appraisal of 2-3 significantly different superstructure design options & comparison to benchmark at Technical Design.	
			1		0		Architect	Prior to planning application	<b>Substructure and hard landscaping options appraisal during Concept Design</b> LCA options appraisal on a combination of at least 6 different substructure or hard landscaping design options (at least 2 of each). Submit prior to planning application.	
	Mat 02	Environmental impacts from construction products - Environmental Product Declarations (EPD)	1		0		Architect		<b>Specification of products with a recognised environmental product declaration (EPD)</b> Total EPD points score of at least 20	
	Mat 03	Responsible sourcing of construction products	✓		✓		Architect/ Contractor		<b>Mandatory - Pre-requisite - All timber used must be 'legal' and 'sustainable' as per UK Government Timber Procurement Policy"</b>	
			1		1			Concept Design	<b>Enabling Sustainable Procurement</b> Contractor sources materials in accordance with a Sustainable Procurement Plan (SPP).	
			3		3				<b>Responsible Sourcing of Materials</b> One credit - Superstructure & >10% of points Two/three credits - internal finishes and substructure & hard landscaping & >20% or >30%	
	Mat 05	Designing for Durability and Resilience	1		1		Architect		<b>Protecting Vulnerable Parts of the Building from Damage.</b> Design and specification measures to limit material degradation due to accidental/malicious damage.  <b>Protecting exposed parts of the building from material degradation</b> Exposed building elements designed to limit degradation due to environmental factors through appropriate quality standard or a detailed assessment of the element's resilience. Convenient access to roof and facade for cleaning/repair and design roof to prevent water damage/ingress.	
	Mat 06	Material Efficiency	1		1		Architect/ Contractor	All design stages from Preparation & Brief	<b>Material Efficiency</b> Opportunities and measures to optimise the use of materials in building design, procurement, construction, maintenance and end of life have been identified. Measures must be implemented and targets/actual material efficiencies achieved reported.	
	1.57%	Total Credit	14		11					
	Per Credit	Section Score	22.00%		17.29%					
	Wst 01	Construction Waste Management	1		1		Demolition contractor / Architect	Concept Design	<b>Pre-demolition audit</b> Pre-demo audit carried out at Concept Design and referred to in RMP.	
			3		2		Contractor		<b>Construction Resource Efficiency -</b> Construction Resource Management Plan (CRMP) ≤7.5m3 (≤6.5 tonnes) per 100 sqm GIFA of non-hazardous construction waste generated.	
			1		1				<b>Diversion of Waste from Landfill</b> Non-Demo - 70% Volume / 80% Tonnage Demolition - 80% Volume / 90% Tonnage	




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>RETAIL PHASE 1</div> <div>SHELL ONLY</div>					<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		VERY GOOD	64.29%							
Waste	Wst 02	Use of recycled and sustainably sourced aggregates	1		0		Contractor / Structural Engineer		<div>Project sustainable aggregate points</div> <div>Pre-requisite - pre-demo audit if applicable.</div> <div>Identify all aggregates including quantity, source, distance travelled.</div>	
	Wst 03	Operational Waste	1		1		Architect		<div>Operational waste</div> <div>Dedicated space to cater for segregation and storage of operational recyclable waste volumes generated. Space is clearly labelled, accessible, of appropriate capacity</div>	
	Wst 05	Adaptation to Climate Change	1		1		Architect / M&E / Structural Engineer	Concept Design & Technical Design	<div>Resilience of structure, fabric, building services and renewables installation</div> <div>Climate change adaptation strategy appraisal</div> <div>Develop recommendations based on appraisal</div> <div>Provide update during technical design on implementation of recommendations</div>	
	Wst 06	Design for disassembly and adaptability	1		1		Architect / Structural Engineer	Concept Design	<div>Design for disassembly and functional adaptability - recommendations</div> <div>- Study to explore ease of disassembly and functional adaptation potential of different designs</div> <div>- Develop recommendations and solutions by end of Concept Design</div>	
			1		0		Architect / Structural Engineer	Concept Design	<div>Disassembly and functional adaptability - implementation</div> <div>Update during Technical Design on implementation of recommendations or solutions and any changes.</div> <div>Produce building adaptability and disassembly guide for prospective tenants.</div>	
	0.80%	Total Credit	10		7					
	Per Credit	Section Score	8.00%		5.60%					
Land Use and Ecology	LE 01	Site Selection	1		1		Architect		<div>Previously occupied land</div> <div>At least 75% of the proposed development's footprint on an area of land which has previously been developed.</div>	
			1		0		Contaminated Land Specialist		<div>Contaminated Land</div> <div>Land deemed to be contaminated and subsequently remediated</div>	
	LE 02	Ecological risks and opportunities	2		2		Ecologist	Preparation & Brief	<div>Survey and evaluation</div> <div>Pre-requisite - assessment route determined using GN34.</div> <div>Compliance against legislation monitored.</div> <div>Survey &amp; evaluation by ecologist to determine baseline and ecological outcomes.</div>	
	LE 03	Managing impacts on ecology	1		1		Ecologist	Concept Design	<div>Planning and measures on-site</div> <div>Roles &amp; responsibilities defined.</div> <div>Site preparation to optimise benefits.</div> <div>Collaboration with stakeholders, solutions implemented.</div>	
			2		2		Ecologist	Concept Design	<div>Managing negative impacts</div> <div>Negative impacts from construction managed according to hierarchy (2 credits = no overall loss of ecological value).</div>	
	LE 04	Ecological change and enhancement	1		1		Ecologist / Contractor	Concept Design	<div>Ecological enhancement</div> <div>Stakeholder liaison solutions and measures implemented in a way that enhances ecological value on site as priority.</div> <div>Data provided to local environmental records centre</div>	
			3		3			Concept Design	<div>Change and enhancement of ecology</div> <div>Calculate change in ecological value to award credits</div>	




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>RETAIL PHASE 1</div> <div>SHELL ONLY</div>					<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		VERY GOOD	64.29%							
	LE 05	Long term ecology management and maintenance	1		1		Ecologist / Contractor		Management and maintenance throughout the project Parts of LE04 are pre-requisite. Monitoring and reporting on project outcomes. Section on ecology in tenant/building owner information	
			1		1		Ecologist		Landscape and ecology management plan Plan developed in accordance with BS 42020:2013 covering first five years after completion.	
	1.46%	Total Credit	13		12					
	Per Credit	Section Score	19.00%		17.54%					
Pollution	Pol 03	Flood and surface water management	2		2		Flood / Drainage Consultant		Pre-requisite - appropriate consultant appointed Flood Resilience 2 Credits for low flood risk <u>or</u> 1 Credit for medium / high flood risk	
			2		1				Surface water run-off Pre-requisite- bespoke surface water run-off design solutions - Peak rate of run-off has 30% improvement for developed site compared to pre-developed for 1 and 100 yr return events. Include climate change allowance. (1 credit) - Flooding of property will not occur in the event of local drainage system failure and use of SuDS to ensure post development runoff volume no greater than pre-development. (1 credit)	
			1		0				Minimising Water Course Pollution No discharge from site for rainfall up to 5mm. Appropriate level of pollution prevention using SuDS. Oil separators.	



BREEAM New Construction (2018) Pre-assessment Summary Tracker

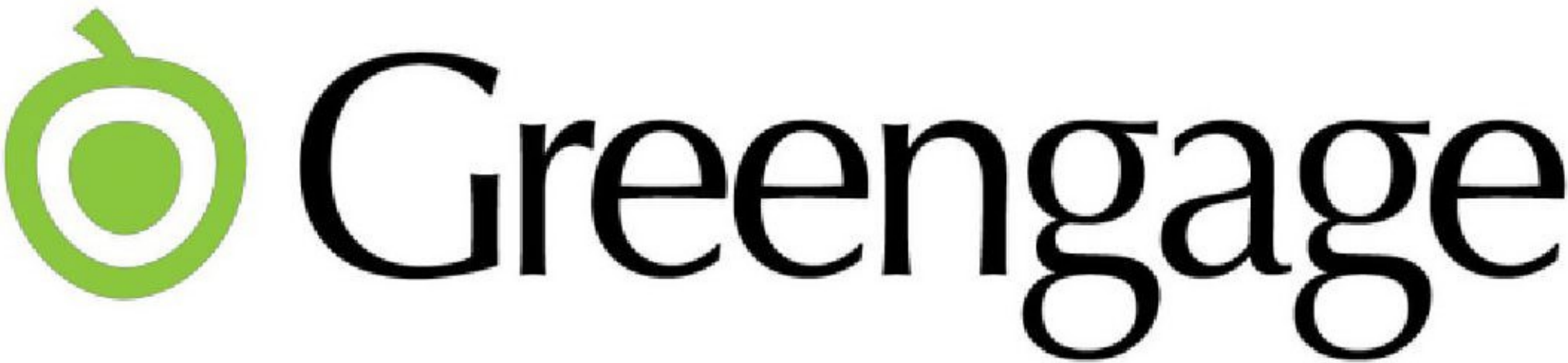
Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>RETAIL PHASE 1</div> <div>SHELL ONLY</div>					<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		VERY GOOD	64.29%							
	Pol 04	Reduction of Night Time Light Pollution	1		1		M&E		<div>Night Time Light Pollution</div> <div>External lighting strategy designed in compliance with ILP Guidance Notes for the Reduction of Obtrusive Light, 2011.</div> <div>All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.</div>	
	1.00%	Total Credit	6		4					
	Per Credit	Section Score	6.00%		4.00%					
Innovation	Man 03	Responsible Construction Practices	1		0		Contractor			
	Hea 01	Visual comfort	2		0		M&E			
	Hea 06	Security	1		0					
	Ene 01	Reduction of energy use and carbon emissions	5		0					
	Wat 01	Water consumption	1		0					
	Mat 01	Life Cycle Impacts	3		0					
	Mat 03	Responsible Sourcing of Materials	1		0					
	Wst 01	Construction Site Waste Management	1		0					
	Wst 02	Recycled Aggregates	1		0					
	Wst 05	Adaptation to Climate Change	1		0		Energy Modeller / M&E / Architect / Structures			
	LE 02	Identifying and understanding the risks and opportunities for the project	1		0		Ecologist / Landscape Architect / Structures			
	LE 04	Change & enhancement of ecological value	1		0		Ecologist / Landscape Architect			
	1.00%	Total Credit	10		0					
Per Credit	Section Score	10.00%		0.00%						
Overall Credits			103.00		56.00					
Final BREEAM Score			110.00%		64.29%					
BREEAM Rating			-		VERY GOOD					



BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name	Clarendon Centre	
Project Number	551564	
Date	17/12/2020	
Targeted BREEAM Rating	EXCELLENT	73.00%


<b>Project Notes:</b> BREEAM 2018 New Construction <b>STUDENT ACCOMMODATION</b> <b>FULLY FITTED</b>		
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Category	Credit ID	Credit Name	Credit(s) Available	Proposed Scenario	Responsibility	Time critical	Credit Issue
	Man 01	Project Brief and Design	1	1	Architect/Project Manager	Concept Design	<b>Project Delivery Consultation</b> A meeting(s) undertaken between key project delivery stakeholders/project team, identifying roles, responsibilities and contributions for key phases of project delivery.
			1	1	Project manager / Planning Consultant	Concept Design - Technical Design	<b>Stakeholder Consultation (third parties)</b> - All relevant interested parties (building users, existing community, partnerships and networks) have been consulted by the design team. - Stakeholder contributions and consultation outcomes have influenced Initial Project Brief and Concept Design. - Consultation feedback has been given to, and received by, all relevant parties prior to completion of detailed design.
			1	1	Client / BREEAM AP	Concept Design	<b>BREEAM AP (Concept Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. AP appointed to work with team to maximise project's performance against BREEAM throughout Concept Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
			1	1	Client / BREEAM AP	Concept Design & Developed Design	<b>BREEAM AP (Developed Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. BREEAM AP (Concept Design) credit must be achieved first. AP is appointed to work with team to maximise project's performance against BREEAM throughout Developed Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
	Man 02	Life cycle cost and service life planning	2	0	Cost Consultants/ Client	Concept Design	<b>Elemental Life Cycle Cost (LCC)</b> Outline entire asset elemental life cycle cost plan carried out.
			1	0		Technical Design	<b>Component level life cycle costing (LCC)</b> In line with PD 156865:2008 & includes (where present): - Envelope, e.g. cladding, windows, and/or roofing - Services, e.g. heat source cooling source, and/or controls - Finishes, e.g. walls, floors and/or ceilings - External spaces, e.g. alternative hard landscaping, boundary protection.  Examples of how the LCC has influenced the design must be given.
			1	1			<b>Capital Cost Reporting</b> Report capital cost in £/sqm GIFA. (Predicted cost at design stage and confirmation at PC) Capital cost includes construction (inc. prep, materials, equipment, labour); site management; construction financing; insurance & taxes; inspection & testing
			✓	✓			<b>Pre-requisite - All timber and timber-based products used during construction are 'legal and sustainable timber'.</b>
			1	1			<b>Environmental Management</b> All parties who control the site site (principal contractor, demo-contractor) operate EMS (ISO14001 or equivalent) for all main operations and best practice pollution prevention in accordance with Pollution Prevention Guidelines PPG6.




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>STUDENT ACCOMMODATION</div> <div>FULLY FITTED</div>				<div></div>	
Project Number		551564							
Date		17/12/2020							
Targeted BREEAM Rating		EXCELLENT	73.00%						
Management	Man 03	Responsible construction practices	1		1	Contractor	Construction	<b>BREEAM AP (site)</b> Pre-requisite: Client and contractor formally agree performance targets. BREEAM AP is appointed to assist with maximising performance, go beyond design intent, monitor progress against targets, identify risks/opportunities, provide feedback, coordinate generation of evidence.	
			2		2			<b>Responsible construction management</b> One credit - achieve applicable items in responsible construction management table Two credits - achieve the above plus six additional items Table items include: vehicle movement, pollution management, tidiness, health & wellbeing, security, training and reporting. CCS will cover majority of the above	
			2		2			<b>Monitoring of Construction Site Impacts</b> Individual appointed to record the utility consumption (energy & water) and transport of construction materials & waste to/from site. Targets must be set and monitored.	
	Man 04	Commissioning and handover	✓		✓			<b>Mandatory - Provision of a Building User Guide (BUG)</b>	
			1		1	Contractor / M&E		<b>Commissioning - Testing Schedule and Responsibilities</b> - Commissioning schedule including suitable timescale for commissioning/ re-commissioning of all complex/ non-complex building services and control systems and testing and inspecting building fabric. - Commissioning activities carried out in accordance with current Building Regs, BSRIA, CIBSE guidelines. - Appoint team member to monitor and programme pre-commissioning, commissioning, testing activities - Contractor accounts for the commissioning within their budget and timeline.	
			1		1	Contractor / M&E		<b>Commissioning - design and preparation</b> Appoint appropriate project team member (by either the client or the principal contractor) to undertake design reviews, give advice, provide commissioning management input during installation and performance testing during handover.	
			1		0	Contractor / M&E		<b>Testing and inspecting building fabric</b> Thermographic survey and airtightness testing.	
			1		1	Contractor / M&E		<b>Handover</b> Develop two BUGs and two Training Schedules: 1) Non-technical for distribution to building occupiers; and 2) Technical for FMs.	
	Man 05	Aftercare	1		1	Client		<b>Aftercare Support</b> - Operational infrastructure in place to provide aftercare support to the occupier including, meetings with the occupier, on-site facilities training and walkabout, weekly attendance on-site for first month, longer term availability for 12 months. - Monitor energy and water consumption for 12 months	
			1		1	Client		<b>Commissioning - implementation (Mandatory Excellent)</b> - Over a 12 month period - Full load and part load, summer and winter as appropriate - Interviews with building occupants where affected - Monthly reports comparing sub-metered energy performance to predicted one - Re-commissioning systems and incorporating any revisions into the O&M manuals	




## BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>STUDENT ACCOMMODATION</div> <div>FULLY FITTED</div>					<div>Greenengage</div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT	73.00%							
			1		0	Client		<div>Post Occupancy Evaluation (POE)</div> <div>3rd party POE one year after occupation including a review of the design intent and construction process as well as feedback from building users on the environmental conditions of the building. Independent party provides report with lessons learned. Client or occupier commits funds to pay for POE in advance.</div>		
	0.52%	Total Credit	21		16					
	Per Credit	Section Score	11.00%		8.38%					
Health and Wellbeing	Hea 01	Visual Comfort	1		1	Architect/ M&E		<div>Control of glare from sunlight</div> <div>Glare control assessment to identify risk areas Glare control strategy for all relevant areas<ul style="list-style-type: none"><li>- Blinds</li><li>- Building Integrated measures</li><li>- Bioclimatic Control</li><li>- External shading or brise soleil</li></ul>Strategy must not increase energy consumption from lighting, therefore curtains are non-compliant.</div>		
			2		2			<div>Daylighting</div> <div>2% daylight factor across 80% NIFA.</div>		
			1		1			<div>View Out</div> <div>95% of floor area in 95% of spaces is within 8m of an external wall with window providing adequate view out and window/opening must be ≥ 20% of the surrounding wall area.</div>		
			1		1			<div>Internal and External lighting levels, Zoning and Controls (External lighting only for S&amp;C)</div> <div>-External lighting to required illuminance levels (where applicable) including SLL Code for Lighting, CIBSE Lighting Guide 5 &amp; 7 and BS EN 12464.</div>		
	Hea 02	Indoor Air Quality	✓		✓	Air Quality Specialist		<div>Pre-requisite: Indoor Air Quality Plan</div> <div>Consideration of:<ul style="list-style-type: none"><li>-removal of contaminant sources</li><li>-dilution and control of contaminant sources</li><li>-procedures for pre-occupancy flush out</li><li>-third party testing and analysis</li><li>-maintaining indoor air quality in use</li></ul></div>		
			1		0	Air Quality Specialist / M&E		<div>Ventilation</div> <div>Ventilation pathways minimise build-up of air pollutants. Air intakes must be 10m horizontal distance from building exhausts and other external sources of pollution. HVAC systems incorporate suitable filtration. Variable occupancy areas have CO2 sensors linked to mechanical ventilation system.</div>		
			2		2			<div>Emissions from construction products</div> <div>One credit: 3 of 5 product types meet emission limits/testing criteria plus wood products Two credits: all product types meet emission limits/testing criteria</div>		




BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre			<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>STUDENT ACCOMMODATION</div> <div>FULLY FITTED</div>				<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT		73.00%						
nd Wellbeing			1		0		M&E		<div>Post construction indoor air quality measurement</div> <div>Formaldehyde concentration in indoor air does not exceed WHO guidelines.</div> <div>TVOC concentration does not exceed specified limits.</div>	
	Hea 04	Thermal comfort	1		1		M&E		<div>Thermal Modelling</div> <div>Thermal modelling carried out using full dynamic thermal analysis software in accordance with CIBSE AM11. Building designed for over heating in accordance with CIBSE TM52. Meets CIBSE Guide A Table 1.5 for winter temperatures.</div> <div>PMV &amp; PPD reported for air conditioned buildings.</div>	
			1		1				<div>Design for future thermal comfort</div> <div>Thermal modelling demonstrates that the building design and services strategy delivers same thermal comfort levels, PMV and PPD indices as for the first credit under a projected climate change environment.</div>	
			1		1				<div>Thermal Zoning and Controls</div> <div>Thermal modelling has informed the temperature control strategy</div> <div>The strategy addresses appropriate zones for heating and cooling, degree of occupant control required, interaction of these systems and potential for manual override of automatic systems.</div>	
	Hea 05	Acoustic performance	4		3		Acoustician		<div>Indoor Ambient Noise</div> <div>The building meets the appropriate acoustic performance standards and testing requirements for the building type. Indoor ambient noise in line with Section 7 of BS 8233:2014</div>	
	Hea 06	Security	1		1		Architect	Concept Design	<div>Security of Site and Building</div> <div>- Suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) including visual audit and the recommendations implemented.</div>	
	Hea 07	Safe and healthy surroundings	1		1		Architect		<div>Safe access</div> <div>Dedicated cycle paths</div> <div>Dedicated/safe footpaths</div> <div>Pedestrian drop off areas providing direct access to footpaths</div> <div>Delivery areas not accessed through general parking areas.</div> <div>Dedicated parking/waiting area for goods vehicles separate to manoeuvring area</div> <div>Parking/turning designed for simple manoeuvring.</div>	
			1		1		Architect		<div>Outside space</div> <div>Providing building users with external amenity area - outdoor, landscaped, appropriate seating, non-smoking, avoids noise disturbance.</div>	
	0.74%	Total Credit	19		16					
	Per Credit	Section Score	14.00%		11.79%					
	Ene 01	Reduction of Energy Use and Carbon Emissions	9		4		M&E		<div>Energy Performance</div> <div>Based on energy performance BRUKL document</div> <div>Minimum 4 credits for Excellent</div>	
			4		0		M&E		<div>Prediction of operational energy consumption</div> <div>Pre-requisite: Preliminary design workshop on operational energy performance</div> <div>Additional energy modelling to generate predicted operational energy consumption figures. Risk assessment carried out.</div>	




## BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>STUDENT ACCOMMODATION</div> <div>FULLY FITTED</div>					<div> Greenengage</div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT	73.00%							
Energy	Ene 02	Energy Monitoring	1		1		M&E		<b>Mandatory - Sub-metering of end-use categories</b> Labelling required for each output: Space heating, DHW, cooling, ventilation, lighting, small power, pumps, renewables, others. Pulsed output BMS for buildings over 1000sqm	
	Ene 03	External Lighting	1		1		M&E		<b>External Lighting</b> Average initial luminous efficacy of external light fittings is not less than 70 luminaire lumens per circuit Watt. External light fittings automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.	
	Ene 04	Low Carbon Design	1		0		M&E	Concept Design	<b>Passive Design Analysis</b> Thermal modelling credit under Hea 04 has been achieved. Identify opportunities for passive design solutions by Concept Design stage Implement passive design measures and quantify reduced total energy demand and CO2 emissions	
			1		0			Concept Design	<b>Free Cooling</b> Analysis of free cooling and implementation opportunities within passive design analysis	
			1		1			Concept Design	<b>Low Zero Carbon Feasibility Study</b> LZC study by energy specialist. LZC technology specified in line with feasibility study. Quantify reduced regulated CO2 emissions.	
	Ene 06	Energy Efficient Transportation Systems	1		1		Lift Consultants		<b>Energy Consumption</b> The energy consumption has been calculated in accordance with BS EN ISO 25745 Energy performance of lifts systems with the lowest energy consumption is specified.	
			1		1				<b>Energy Efficient Features - energy consumption credit is achieved</b> Lifts must be specified to operate in standby condition during off-peak periods, compliant lighting (> 55 lamp lumens/circuit Watt.), compliant drive controller AND use of regenerative drive demonstrates energy reduction.	




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Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT		73.00%						
	Ene 08	Energy Efficient Equipment	2		0	Operator		<b>Unregulated Energy</b> - Identify the buildings unregulated energy loads and estimate their contribution to the total annual unregulated energy demand. - Identify the systems that use a significant proportion of the buildings unregulated energy consumption. - Demonstrate a meaningful reduction in this energy consumption through appropriate specification.		
	0.73%	Total Credit	22		9					
	Per Credit	Section Score	16.00%		6.55%					
Transport	Tra 01	Transport assessment and travel plan	2		2	Transport consultant		<b>Travel Plan</b> Developing a travel plan, based upon the findings set out within a travel assessment/statement, incorporating the sustainable measures into the design.		
	Tra 02	Sustainable transport measures	10		3	Transport consultant / Architect		<b>Transport options implementation</b> Tra 01 is pre-requisite Identify sustainable transport options, award credits based on AI and number of options. Measures include - cycle storage, cycle facilities, existing amenities.		
	0.83%	Total Credit	12		5					
	Per Credit	Section Score	10.00%		4.17%					
Water	Wat 01	Water Consumption	5		4	M&E/ Architect		<b>Mandatory 1 credit for 12.5% improvement</b> 1 credit - 12.5% improvement over baseline performance- litres/person/day. 2 credits - 25% improvement over baseline performance- litres/person/day. 3 credits - 40% improvement over baseline performance- litres/person/day. 4 credits - 50% improvement over baseline performance- litres/person/day . 5 credits - 55% improvement over baseline performance- litres/person/day.  >3 credits requires the implementation of greywater/rainwater recycling.		
	Wat 02	Water Monitoring	1		1	M&E		<b>Water meter</b> - Specification of water meter on mains supply to each building - Pulsed water meter to enable BMS connection		
	Wat 03	Water Leak Detection	1		1	M&E		<b>Leak Detection System</b> Leak detection system capable of detecting major leak on mains.		
			1		1			<b>Flow Control Devices</b> Sanitary supply shut-off. Flow control devices fitted to each WC area/facility to ensure water is supplied only when needed.		
	0.88%	Total Credit	8		7					
	Per Credit	Section Score	7.00%		6.13%					
	Mat 01	Environmental impacts from construction products - Building life cycle assessment (LCA)	6		6	Architect	Prior to planning application	<b>Superstructure</b> Building LCA options appraisal of 2-4 significantly different superstructure design options & comparison to benchmark at Concept Design, submit prior to planning application Building LCA options appraisal of 2-3 significantly different superstructure design options & comparison to benchmark at Technical Design.		
			1		0	Architect	Prior to planning application	<b>Substructure and hard landscaping options appraisal during Concept Design</b> LCA options appraisal on a combination of at least 6 different substructure or hard landscaping design options (at least 2 of each). Submit prior to planning application.		



BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>STUDENT ACCOMMODATION</div> <div>FULLY FITTED</div>				<div></div>	
Project Number		551564							
Date		17/12/2020							
Targeted BREEAM Rating		EXCELLENT	73.00%						
Materials	Mat 02	Environmental impacts from construction products - Environmental Product Declarations (EPD)	1		0		Architect		<b>Specification of products with a recognised environmental product declaration (EPD)</b> Total EPD points score of at least 20
	Mat 03	Responsible sourcing of construction products	✓		✓		Architect/ Contractor		<b>Mandatory - Pre-requisite - All timber used must be 'legal' and 'sustainable' as per UK Government Timber Procurement Policy"</b>
			1		1			Concept Design	<b>Enabling Sustainable Procurement</b> Contractor sources materials in accordance with a Sustainable Procurement Plan (SPP).
			3		3				<b>Responsible Sourcing of Materials</b> One credit - Superstructure & >10% of points Two/three credits - internal finishes and substructure & hard landscaping & >20% or >30%
	Mat 05	Designing for Durability and Resilience	1		1		Architect		<b>Protecting Vulnerable Parts of the Building from Damage.</b> Design and specification measures to limit material degradation due to accidental/malicious damage.  <b>Protecting exposed parts of the building from material degradation</b> Exposed building elements designed to limit degradation due to environmental factors through appropriate quality standard or a detailed assessment of the element's resilience. Convenient access to roof and facade for cleaning/repair and design roof to prevent water damage/ingress.
	Mat 06	Material Efficiency	1		1		Architect/ Contractor	All design stages from Preparation & Brief	<b>Material Efficiency</b> Opportunities and measures to optimise the use of materials in building design, procurement, construction, maintenance and end of life have been identified. Measures must be implemented and targets/actual material efficiencies achieved reported.
	1.07%	Total Credit	14		12				
	Per Credit	Section Score	15.00%		12.86%				
Waste	Wst 01	Construction Waste Management	1		1		Demolition contractor / Architect	Concept Design	<b>Pre-demolition audit</b> Pre-demo audit carried out at Concept Design and referred to in RMP.
			3		2		Contractor		<b>Construction Resource Efficiency -</b> Construction Resource Management Plan (CRMP) ≤7.5m3 (≤6.5 tonnes) per 100 sqm GIFA of non-hazardous construction waste generated.
			1		1				<b>Diversion of Waste from Landfill</b> Non-Demo - 70% Volume / 80% Tonnage Demolition - 80% Volume / 90% Tonnage
	Wst 02	Use of recycled and sustainably sourced aggregates	1		1		Contractor / Structural Engineer		<b>Project sustainable aggregate points</b> Pre-requisite - pre-demo audit if applicable. Identify all aggregates including quantity, source, distance travelled.
	Wst 03	Operational Waste	1		1		Architect		<b>Operational waste</b> Dedicated space to cater for segregation and storage of operational recyclable waste volumes generated. Space is clearly labelled, accessible, of appropriate capacity




## BREEAM New Construction (2018) Pre-assessment Summary Tracker

Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>STUDENT ACCOMMODATION</div> <div>FULLY FITTED</div> <div></div>				
Project Number		551564						
Date		17/12/2020						
Targeted BREEAM Rating		EXCELLENT	73.00%					
	Wst 05	Adaptation to Climate Change	1		1	Architect / M&E / Structural Engineer	Concept Design & Technical Design	<b>Resilience of structure, fabric, building services and renewables installation</b> Climate change adaptation strategy appraisal Develop recommendations based on appraisal Provide update during technical design on implementation of recommendations
	Wst 06	Design for disassembly and adaptability	1		1	Architect / Structural Engineer	Concept Design	<b>Design for disassembly and functional adaptability - recommendations</b> - Study to explore ease of disassembly and functional adaptation potential of different designs - Develop recommendations and solutions by end of Concept Design
			1		0	Architect / Structural Engineer	Concept Design	<b>Disassembly and functional adaptability - implementation</b> Update during Technical Design on implementation of recommendations or solutions and any changes. Produce building adaptability and disassembly guide for prospective tenants.
	0.60%	Total Credit	10		8			
	Per Credit	Section Score	6.00%		4.80%			
Land Use and Ecology	LE 01	Site Selection	1		1	Architect		<b>Previously occupied land</b> At least 75% of the proposed development's footprint on an area of land which has previously been developed.
			1		0	Contaminated Land Specialist		<b>Contaminated Land</b> Land deemed to be contaminated and subsequently remediated
	LE 02	Ecological risks and opportunities	2		2	Ecologist	Preparation & Brief	<b>Survey and evaluation</b> Pre-requisite - assessment route determined using GN34. Compliance against legislation monitored. Survey & evaluation by ecologist to determine baseline and ecological outcomes.
	LE 03	Managing impacts on ecology	1		1	Ecologist	Concept Design	<b>Planning and measures on-site</b> Roles & responsibilities defined. Site preparation to optimise benefits. Collaboration with stakeholders, solutions implemented.
			2		2	Ecologist	Concept Design	<b>Managing negative impacts</b> Negative impacts from construction managed according to hierarchy (2 credits = no overall loss of ecological value).
	LE 04	Ecological change and enhancement	1		1	Ecologist / Contractor	Concept Design	<b>Ecological enhancement</b> Stakeholder liaison solutions and measures implemented in a way that enhances ecological value on site as priority. Data provided to local environmental records centre
			3		3		Concept Design	<b>Change and enhancement of ecology</b> Calculate change in ecological value to award credits




BREEAM New Construction (2018) Pre-assessment Summary Tracker

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Project Number		551564									
Date		17/12/2020									
Targeted BREEAM Rating		EXCELLENT	73.00%								
	LE 05	Long term ecology management and maintenance	1		1		Ecologist / Contractor				<b>Management and maintenance throughout the project</b> Parts of LE04 are pre-requisite. Monitoring and reporting on project outcomes. Section on ecology in tenant/building owner information
			1		1		Ecologist				<b>Landscape and ecology management plan</b> Plan developed in accordance with BS 42020:2013 covering first five years after completion.
	1.00%	Total Credit	13		12						
	Per Credit	Section Score	13.00%		12.00%						
Pollution	Pol 01	Impact of Refrigerants	2		1		M&E		<b>Pre-requisite- compliance with BS EN 378:2016 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice.</b>		
			1		0				<b>Impact of refrigerant</b> 2 credits: Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELC CO2e) of ≤ 100 kgCO2e/kW cooling/heating capacity OR all refrigerants used have GWP <10. 1 Credit : Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELC CO2e) of ≤ 1000 kgCO2e/kW cooling/heating capacity.		
	Pol 02	Local air quality	2		2		M&E		<b>Leak Detection</b> Refrigerant leak detection system installed or the system is Hermetically sealed.		
			2		2				<b>Local air quality</b> Combsution plant emissions from plant providing space heating and doemstic hot water do not exceed required levels in table.		
	Pol 03	Flood and surface water management	2		2		Flood / Drainage Consultant		<b>Pre-requisite - appropriate consultant appointed</b> <b>Flood Resilience</b> 2 Credits for low flood risk or 1 Credit for medium / high flood risk		
			2		1				<b>Surface water run-off</b> <b>Pre-requisite- bespoke surface water run-off design solutions</b> - Peak rate of run-off has 30% improvement for developed site compared to pre-developed for 1 and 100 yr return events. Include climate change allowance. (1 credit) - Flooding of property will not occur in the event of local drainage system failure and use of SuDS to ensure post development runoff volume no greater than pre-development. (1 credit)		
			1		0				<b>Minimising Water Course Pollution</b> No discharge from site for rainfall up to 5mm. Appropriate level of pollution prevention using SuDS. Oil separators.		



BREEAM New Construction (2018) Pre-assessment Summary Tracker

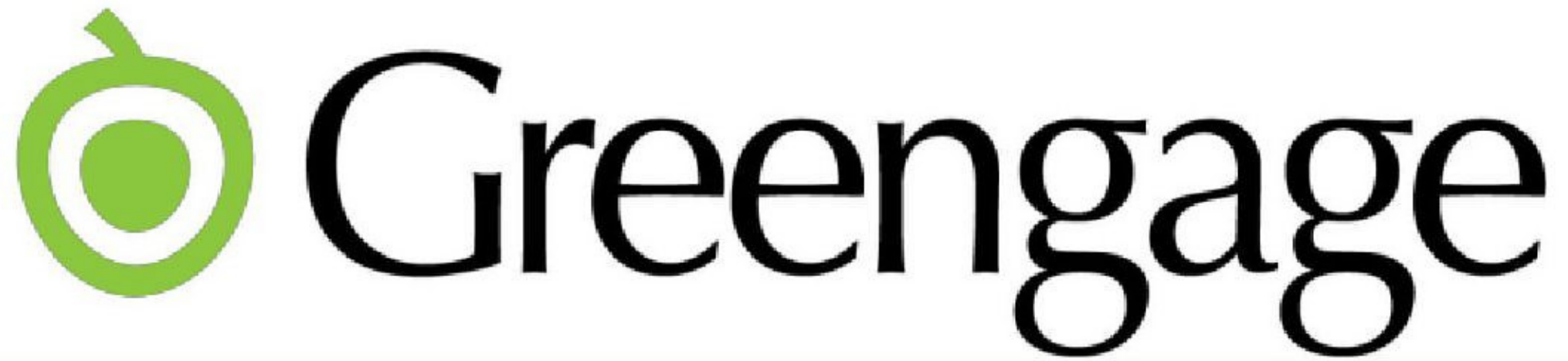
Project Name		Clarendon Centre		<div>Project Notes:</div> <div>BREEAM 2018 New Construction</div> <div>STUDENT ACCOMMODATION</div> <div>FULLY FITTED</div>					<div></div>	
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT	73.00%							
	Pol 04	Reduction of Night Time Light Pollution	1		1		M&E		<div>Night Time Light Pollution</div> <div>External lighting strategy designed in compliance with ILP Guidance Notes for the Reduction of Obtrusive Light, 2011.</div> <div>All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.</div>	
	Pol 05	Reduction of Noise Pollution	1		1		Acoustician		<div>Acoustic Report</div> <div>Noise impact assessment in compliance with BS 4142:2014. Noise from assessed building 5dB lower than background noise.</div>	
	0.67%	Total Credit	12		8					
	Per Credit	Section Score	8.00%		5.33%					
Innovation	Man 03	Responsible Construction Practices	1		0		Contractor			
	Hea 01	Visual comfort	2		0		M&E			
	Hea 02	Indoor air quality	1		0					
	Hea 06	Security	1		0					
	Ene 01	Reduction of energy use and carbon emissions	5		0					
	Wat 01	Water consumption	1		0					
	Mat 01	Life Cycle Impacts	3		0					
	Mat 03	Responsible Sourcing of Materials	1		0					
	Wst 01	Construction Site Waste Management	1		0					
	Wst 02	Recycled Aggregates	1		0					
	Wst 05	Adaptation to Climate Change	1		0		Energy Modeller / M&E / Architect / Structures			
	LE 02	Identifying and understanding the risks and opportunities for the project	1		0		Ecologist / Landscape Architect / Structures			
	LE 04	Change & enhancement of ecological value	1		1		Ecologist / Landscape Architect			
	1.00%	Total Credit	10		1					
Per Credit	Section Score	10.00%		1.00%						
Overall Credits			141.00		94.00					
Final BREEAM Score			110.00%		73.00%					
BREEAM Rating			-		EXCELLENT					



BREEAM Non-Dom RFO (2014) Design Stage Summary Tracker

Project Name	Clarendon Centre	
Project Number	551564	
Date	17/12/2020	
Targeted BREEAM Rating	EXCELLENT	73.08%


<b>Project Notes</b> BREEAM Non-Dom RFO 2014 OFFICE PARTS 1-3		
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Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue
	Man 01	Project Brief and Design	1	1	Architect/Project Manager	Time Critical RIBA Stage 2	<b>Project Delivery Consultation</b> A meeting(s) must be undertaken between the key project delivery stakeholders (as a minimum: the client, the building occupier, the design team and the Principal Contractor [or someone with construction experience]), identifying roles, responsibilities and contributions for key phases of project delivery.
			1	1		Time Critical RIBA Stage 2 & 4	<b>Stakeholder Consultation (third parties)</b> - All relevant interested parties (building users, existing community, partnerships and networks) have been consulted by the design team. - Stakeholder contributions and consultation outcomes have influenced Initial Project Brief and Concept Design. - Consultation feedback has been given to, and received by, all relevant parties prior to completion of detailed design.
			1	1		Time Critical RIBA Stage 2	<b>BREEAM AP (Concept Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. AP is appointed to work with team to maximise project's performance against BREEAM throughout Concept Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
			1	1			<b>BREEAM AP (Developed Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. BREEAM AP (Concept Design) credit must be achieved first. AP is appointed to work with team to maximise project's performance against BREEAM throughout Developed Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
	Man 02	Life cycle cost and service life planning	2	0	Cost Consultants/ Client	Time Critical RIBA Stage 2	<b>Elemental Life Cycle Cost (LCC)</b> Outline entire asset elemental life cycle cost plan carried out, in line with PD 156865:2008, covering the expected life span of the refurbished building e.g. 20, 30, 50+ years, the servicing strategy for the projects outlining services component over a 15-year period and a fit-out strategy outlining fit-out options over a 10-year period.
			1	0		Time Critical RIBA Stage 4	<b>Component level life cycle costing (LCC)</b> In line with PD 156865:2008 & includes (where present): - Part 1: Envelope, e.g. cladding, windows, and/or roofing - Part 2&3: Services, e.g. heat source cooling source, and/or controls - Parts 1-4: Finishes, e.g. walls, floors and/or ceilings - Where applicable: External spaces, e.g. alternative hard landscaping, boundary protection.  Examples of how the LCC has influenced the design must be given.
			1	1			<b>Capital Cost Reporting</b> in £/sqm At the design stage, where the final information is not available, credit can be awarded where the client provides predicted capital cost, including contingencies, and commits to providing this information for the final stage of assessment.




Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>			
Project Number		551564					
Date		17/12/2020					
Targeted BREEAM Rating		EXCELLENT	73.08%				
Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue
Management	Man 03	Responsible construction practices	✓	✓	Contractor		Mandatory- All site timber used in the project is sourced in accordance with the UK government’s Timber Procurement Policy.
			1	1			Environmental Management All parties who control the site site (principal contractor, demo-contractor) operate EMS (ISO14001 or equivalent) for all main operations and best practice pollution prevention in accordance with Pollution Prevention Guidelines PPG6.
			1	1		RIBA Stage 5 - 6	BREEAM AP (site) Pre-requisite: Client and contractor formally agree performance targets. BREEAM AP is appointed to assstist with maximise performance, going beyond design intent, monitor progress against targets, identify risks/opportunities, provide feedback, coordinate generation of evidence.
			2	2			Responsible Construction Management Contractor achieves score between 35 and 38 (one credit) or 39+ (two credits) in a compliant scheme. A score of 7 in each of the 5 sections must be achieved.
			2	2			Monitoring of Construction Site Impacts An individual is appointed to record the utility consumption (energy & water) and transport of construction materials & waste to/from site. Targets must be set and monitored.
	Man 04	Commissioning and handover	✓	✓			Mandatory Criterion 9- Provision of a Building User Guide (BUG)
			1	1	Contractor		Commissioning - Testing Schedule and Responsibilities - A schedule of commissioning including suitable timescale for commissioning/ re-commissioning of all complex/ non-complex building services and control systems and testing and inspecting building fabric. - Commissioning activities carried out in accordance with current Building Regulations, BSRIA, CIBSE guidelines. - Appoint a team member to monitor and programme pre-commissioning, commissioning, testing activities on behalf of the client. - Contractor accounts for the commissioning within their budget and timeline.
			1	1	Contractor		Commissioning Building Services Appoint specialist commissioning manager (by either the client or the principal contractor) to undertake design reviews, give advice, provide commissioning management input during installation and performance testing during handover.
			1	0			Commissioning building fabric Thermographic survey and airtightness testing
		1	1	Contractor		Handover Provide a Building User guide (BUG) covering all those issues that are part of the works. Training schedule prepared for building occupiers.	





Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>				<div>Greenengage</div>	
Project Number		551564							
Date		17/12/2020							
Targeted BREEAM Rating		EXCELLENT	73.08%						
Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue		
	Man 05	Aftercare	1	1	Contractor / Client		<b>Aftercare Support</b> - Operational infrastructure in place to provide aftercare support to the occupier including, meetings with the occupier, on-site facilities training and walkabout, weekly attendance on-site for first month, longer term availability for 12 months. - Monitor energy and water consumption for 12 months		
			1	1			<b>Seasonal Commissioning (Mandatory Excellent)</b> - Over a 12 month period - Full load and part load, summer and winter as appropriate - Interviews with building occupants where affected - Re-commissioning systems and incorporating any revisions into the O&M manuals		
			1	0			<b>Post Occupancy Evaluation</b> 3rd party POE including a review of the design intent and construction process as well as feedback from building users on the environmental conditions of the building. Information is appropriately shared to facilitate lessons learnt		
	0.69%	Total Credit	21	16					
	Per Credit	Section Score	14.50%	11.05%					
Health and V	Hea 01	Visual Comfort	3	0	Architect/ M&E		<b>Daylighting - up to 3 credits</b> 2% daylight factor across 80% NIFA. Calculations required to confirm feasibility.		
			2	2			<b>View out - 2 credits</b> 95% of the relevant building floor area is within 7m of a wall with window and window/opening must be ≥ 20% of the surrounding wall area.		
			1	1			<b>Internal, External Lighting Levels &amp; Zoning and Control</b> -Fluorescent and CFL with high frequency ballasts -Internal & external lighting to required illuminance levels -Internal lighting zoned for occupant control		
	Hea 02	Indoor Air Quality	1	1	M&E		<b>Indoor Air Quality Plan</b> a. Removal of contaminant sources b. Dilution and control of contaminant sources c. Procedures for pre-occupancy flush out d. Protection of Heating Ventilation and Air Conditioning (HVAC) systems from sources of pollution during refurbishment/fit-out works e.g. dust e. Procedures for protecting the indoor air quality of areas outside of the refurbishment or fit-out zone that may be affected by the refurbishment/fit-out works f. Procedures for identifying and implementing third party testing and analysis required to ascertain that the contaminant sources have been removed effectively before occupancy g. Commitments for maintaining indoor air quality in-use, e.g. maintenance and cleaning		
			1	0			<b>Ventilation</b> Ventilation pathways minimise build-up of air pollutants. Air intakes must be 10m horizontal distance from building exhausts and other external sources of pollution. HVAC systems incorporate suitable filtration. Variable occupancy areas have CO2 sensors linked to mechanical ventilation system.		



Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>				<div></div>		
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT	73.08%							
Category	Credit ID	Credit Name	Credit(s) Available		Credits assumed		Responsibility	Completion		Credit Issue
Wellbeing			1		0		M&E			<b>Adaptability- Potential for natural Ventilation</b> Occupied spaces of the building are capable of providing fresh air entirely via natural ventilation.
	Hea 04	Thermal comfort	1		1		M&E			<b>Thermal Modelling</b> Thermal modelling has been carried out using software in accordance with CIBSE AM11. Building designed for over heating in accordance with CIBSE TM52.
			1		1				<b>Adaptability- for a Projected Climate Change Scenario</b> Thermal modelling demonstrates that the building design and services strategy can deliver the same thermal comfort levels, PMV and PPD indices in occupied spaces achieved for the first credit under a projected climate change environment.	
			1		1				<b>Thermal Zoning and Controls</b> Thermal modelling has informed the temperature control strategy The strategy addresses appropriate zones for heating and cooling, degree of occupant control required, interaction of these systems and potential for manual override of automatic systems.	
	Hea 05	Acoustic Performance	2		0		Acoustician			<b>Acoustic Report</b> a. Sound insulation b. Indoor ambient noise level
	Hea 06	Safety and Security	1		1		Architect / ALO	RIBA Stage 2		<b>Security of Site and Building</b> - Suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) including visual audit and the recommendations implemented.
	0.82%	Total Credit	15		8					
	Per Credit	Section Score	12.36%		6.59%					
	Ene 01	Reduction of Energy Use and Carbon	15		10		M&E			<b>6 Credits Mandatory Excellent</b>
										<b>Energy Performance NDR</b> Based on improvement in energy performance from existing to proposed building
	Ene 02	Energy Monitoring	1		1		M&E			<b>Mandatory - Sub-metering Major Energy Consuming (pulsed output)</b> Labelling required for each output: Space heating, Domestic Hot Water, Cooling, Lighting, Small power, Other major energy-consuming items.
									1	1
Ene 03	External Lighting	1		1		M&E/ Architect			<b>External Lighting</b> The average initial luminous efficacy of the external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt. All external light fittings are automatically controlled for prevention of operation during daylight	

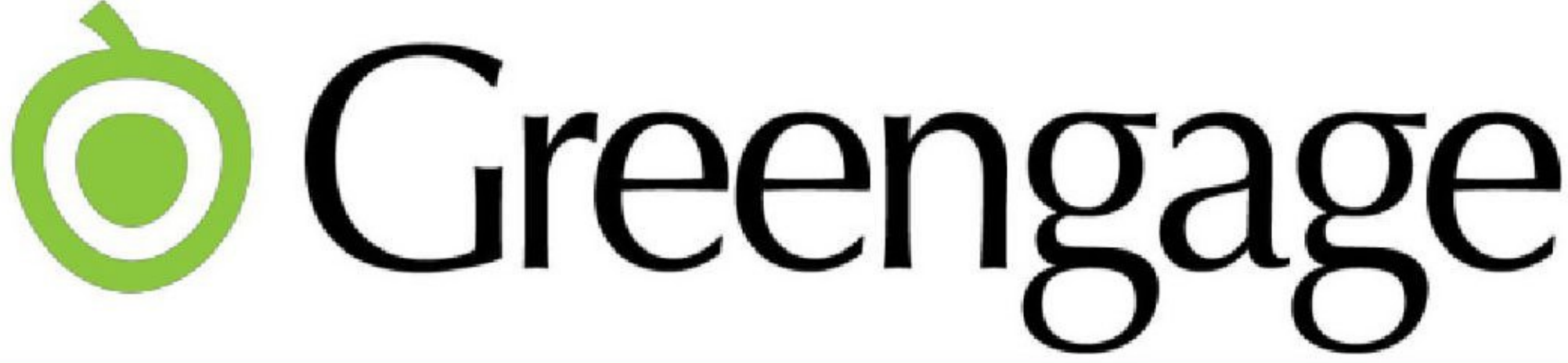




Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>			
Project Number		551564					
Date		17/12/2020					
Targeted BREEAM Rating		EXCELLENT	73.08%				
Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue
Energy	Ene 04	Low Carbon Design	1	0	M&E/ Architect	Time Critical RIBA Stage 2	<b>Passive Design Analysis</b> Thermal modelling credit under Hea 04 has been achieved. Identify opportunities for passive design solutions by Concept Design stage (RIBA Stage 2 or equivalent)
			1	0			<b>Free Cooling</b> Analysis of free cooling and implementation opportunities within passive design analysis.
			1	1			<b>Low Zero Carbon Feasibility Study</b> LZC study by energy specialist and a local LZC technology has been specified in line with the feasibility study and results in at least 5% reduction in regulated carbon dioxide (CO2) emissions.
	Ene 06	Energy Efficient Transportation	1		M&E / Client		<b>Energy Consumption</b> The energy consumption has been calculated in accordance with BS EN ISO 25745 Energy performance of lifts systems with the lowest energy consumption is specified.
			2				<b>Energy Efficient Features - energy consumption credit is achieved</b> Lifts must be specified to operate in standby condition during off-peak periods, compliant lighting (> 55 lamp lumens/circuit Watt.), compliant drive controller AND use of regenerative drive demonstrates energy reduction.
	0.70%	Total Credit	24	14			
	Per Credit	Section Score	16.70%	9.74%			
Transport	Tra 01	Public Transport Accessibility	5	5	Assessor		<b>Accessibility Index</b> Calculate the site's Accessibilty Index (AI) based upon its proximity to transport nodes and the frequencies of services operating.
	Tra 02	Proximity to Amenities	1	1	Assessor		<b>Proximity to Local Amenities</b> Calculate the site's proximity to local amenities.
	Tra 03	Cyclist facilities	1	1	Architect/ M&E		<b>Cycle Storage</b> Provide a compliant number of cycle storage spaces.
			1	1			<b>Cycle Storage</b> Provide at least 2 of the four plausible compliant cyclist facilities.






Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>				<div></div>		
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT73.08%								
Category	Credit ID	Credit Name	Credit(s) Available		Credits assumed		Responsibility	Completion		Credit Issue
	Tra 05	Travel Plan	1		1		Architect/Client	Time Critical feasibility and design stage		<b>Travel Plan</b> Developing a travel plan, based upon the findings set out within a travel assessment/statement, incorporating the sustainable measures into the design.
	0.81%	Total Credit	9		9					
	Per Credit	Section Score	7.25%		7.25%					
Water	Wat 01	Water Consumption	5		4		M&E/ Architect			<b>Mandatory 1 credit for 12.5% improvement</b> 1 credit - 12.5% improvement over baseline performance- litres/person/day 2 credits - 25% improvement over baseline performance- litres/person/day 3 credits - 40% improvement over baseline performance- litres/person/day <b>4 credits - 50% improvement over baseline performance- litres/person/day</b> 5 credits - 55% improvement over baseline performance- litres/person/day
	Wat 02	Water Monitoring	1		1		M&E			<b>Mandatory Criterion 1</b> Criterion 1- specification of water meter on mains - Areas of 10% + of water consumption fitted with sub-meters - Sub-meters connected to BMS - Pulsed water meter.
	Wat 03	Water Leak Detection	1		1		M&E			<b>Leak Detection System</b> Leak detection system capable of detecting major leak on mains.
			1		1				<b>Flow Control Devices</b> Sanitary supply shut-off. Flow control devices to be fitted to each WC area/facility to ensure water is supplied only when needed.	
	0.81%	Total Credit	8		7					
	Per Credit	Section Score	6.44%		5.64%					
	Mat 01	Life Cycle Impacts	6		6		Architect / LCA consultant			<b>Material Efficiency</b> Building LCA model
	Mat 03	Responsible Sourcing of Materials	✓		✓		Architect/ Contractor			<b>Mandatory Criterion - Pre-requisite - All timber used must be "legally harvested and traded"</b>
			1		1				<b>Sustainable Procurement Plan</b> Contractor sources materials in accordance with a Sustainable Procurement Plan (SPP).	
			3		2				<b>Responsible Sourcing of Materials</b> Source materials from suppliers holding compliant Responsible Sourcing Certification Scheme (RSCS) Certificates. 1 credit ≥12% 2 credits ≥36% 3 credits ≥54%	






Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>				<div></div>		
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT73.08%								
Category	Credit ID	Credit Name	Credit(s) Available		Credits assumed		Responsibility	Completion		Credit Issue
Materials	Mat 04	Insulation	1		1		Architect/ Contractor/ M&E			<b>Embodied Impact</b> - Assesses External walls - Ground floor - Roof - Building Services
	Mat 05	Designing for Durability and Resilience	1		1		Architect			<b>Protecting Vulnerable Parts of the Building from Damage.</b> Design and specification measures to limit material degradation due to environmental factors e.g. corrosion, rotting, discolouration.
	Mat 06	Material Efficiency	1		1		Architect/ Contractor	Time Critical RIBA Stage 1, 2, 3, 4, 5		<b>Opportunities, Measures to Optimise the use of Materials</b> Opportunities and measures to optimise the use of materials in building design, procurement, construction, maintenance and end of life have been identified.
	1.16%	Total Credit		13		12				
	Per Credit	Section Score		15.11%		13.95%				
Waste	Wst 01	Project Waste Management	1		1		Contractor / Demo Contractor	Time Critical RIBA Stage 2		<b>Pre-Refurbishment Audit</b> An audit is carried out by a competent person, prior to the start of works on site, to analyse what materials can be re-used, recycled and predict waste. These should then be compared against actual waste arisings.
			2		0				<b>Reuse and Direct Recycling of Materials</b> Where waste materials are either directly re-used on-site or off-site or are sent back to the manufacturer for closed loop recycling.	
			3		2				<b>Resource Efficiency</b> Resource management plan including targets: 2 credits: <4.5m3 or <1.2tonnes waste / 100sqm GIFA 3 credits: <2.1m3 or <0.4tonnes waste / 100sqm GIFA	
			1		1				<b>Diversion of Resources From Landfill</b> Non Demo - 70% Volume / 80% Tonnage Demolition - 80% Volume / 90% Tonnage	
	Wst 03	Operational waste	1		1		Architect / M&E			<b>Mandatory Operational Waste - only criteria 1 and 2</b> Where there is a dedicated space to cater for the segregation and storage of operational recyclable waste volumes generated clearly labelled, accessible, of capacity appropriate. Additional conditions are also set for healthcare and multi-residential buildings.
	Wst 04	Speculative finishes	1		1		Architect			<b>Speculative finishes</b> Floor and ceiling finishes to no more than 25% of office floor area
	Wst 05	Adaptation to Climate Change	1		1		Architect / M&E / Structural Engineer	RIBA Stage 2		<b>Adaption of Climate Change</b> Climate change adaptation strategy appraisal at RIBA Stage 2. Develop recommendations based on appraisal and provide update during technical design on implementation of recommendations.



Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>			
Project Number		551564					
Date		17/12/2020					
Targeted BREEAM Rating		EXCELLENT	73.08%				
Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue
	Wst 06	Functional Adaptability	1	1	Architect / M&E / Structural Engineer	Time Critical RIBA Stage 2 & 4	<b>Functional Adaptability</b> A building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design, with measures implemented at the Technical Design, with any omissions justified in writing.
	0.76%	Total Credit	11	8			
	Per Credit	Section Score	8.31%	6.04%			
	LE 04	Enhancing Site Ecology	1	1	Ecologist / Contractor	Time Critical RIBA Stage 2	<b>Ecologist's Report and Recommendations</b> Implementation of the recommendations. - Based on D&A Statement Bird and Bat boxes to be considered along with further ecological enhancements.
	LE 05	Long Term Impact on Biodiversity	2	2	Ecologist / Contractor		<b>Additional Ecology Measures</b> SQE Appointment, Additional Recommendations Implemented and LHMP Developed as Required.
	2.42%	Total Credit	3	3			
	Per Credit	Section Score	7.25%	7.25%			
Pollution	Pol 01	Impact of Refrigerants	2	1	M&E		<b>Refrigerant System</b> Pre-requisite: All systems (with electric compressors) must comply with the requirements of BS EN 378:2008 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice.  Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELC CO2) of ≤ 100 kgCO <sub>2e</sub> /kW cooling/heating capacity.
			1	0			<b>Leak detection</b> - Specify permanent automated refrigerant leak detection system installed. - Automatic isolation and containment of the remaining refrigerants during leak incident ( shutdown pump down CAN be specified)
	Pol 02	NOx Emissions	3	0	M&E		<b>NOx Emissions</b> NOx emissions generated for the heating and hot water meet the following levels: ≤ 100 mg/kWh = 1 credit ≤ 70 mg/kWh - 2 credits ≤ 40 mg/kWh = 3 credits
	Pol 03	Surface Water Run-Off	2	2	Flood Risk / Drainage Consultant		<b>Flood Resilience</b> 2 Credits Low flood risk 1 Credit for Medium / High Flood Risk
			2	1			<b>Surface Water Run-Off</b> 2 Credits Reducing Run-Off
			1	0			<b>Minimising Water Course Pollution</b> No discharge from site for rainfall up to 5mm. Appropriate level of pollution prevention using SuDS. Oil separators.





Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>OFFICE PARTS 1-3</div>				<div></div>		
Project Number		551564								
Date		17/12/2020								
Targeted BREEAM Rating		EXCELLENT73.08%								
Category	Credit ID	Credit Name	Credit(s) Available		Credits assumed		Responsibility	Completion		Credit Issue
	Pol 04	Reduction of Night Time Light Pollution	1		1		Architect / M&E			<b>Night Time Light Pollution</b> Where external lighting pollution has been eliminated through effective design that removes the need for external lighting without adversely affecting the safety and security of the site and its users. OR The external lighting strategy has been designed in compliance with the ILP Guidance notes for the reduction of obtrusive light, 2011 All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.
	Pol 05	Reduction of Noise Pollution	1		1		Acoustician			<b>Acoustic Report</b> An SQA carried out noise assessment 800m radius, confirmation that the noise survey was in compliance with BS4142;1997.
	0.93%	Total Credit	13		6					
	Per Credit	Section Score	12.08%		5.58%					
Innovation	Man 03	Responsible construction practices	1		0					
	Hea 01	Visual comfort	1		0					
	Ene 01	Reduction of energy use and carbon emissions	1		0					
	Wat 01	Water consumption	2		0					
	Mat 01	Life Cycle Impacts	5		0					
	Mat 03	Responsible Sourcing of Materials	1		0					
	Wst 01	Construction Site Waste Management	1		0					
	Wst 02	Recycled Aggregates	1		0					
	Wst 05	Adaptation to Climate Change	1		0					
	Pol 03	Surface water run off (Simple buildings only)	1		0					
	1.00%	Total Credit	10		0					
	Per Credit	Section Score	10.00%		0.00%					
Overall Credits			124.00		83.00					
Final BREEAM Score			102.75%		73.08%					
BREEAM Rating					EXCELLENT					





BREEAM Non-Dom RFO (2014) Summary Tracker


Project Name	Clarendon Centre	
Project Number	551564	
Date	17/12/2020	
Targeted BREEAM Rating	VERY GOOD	59.03%

<b>Project Notes</b> BREEAM Non-Dom RFO 2014 RETAIL PART 1	
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Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue
Management	Man 01	Project Brief and Design	1	1	Architect/Project Manager	Time Critical RIBA Stage 2	<b>Project Delivery Consultation</b> A meeting(s) must be undertaken between the key project delivery stakeholders (as a minimum: the client, the building occupier, the design team and the Principal Contractor [or someone with construction experience]), identifying roles, responsibilities and contributions for key phases of project delivery.
			1	1		Time Critical RIBA Stage 2 & 4	<b>Stakeholder Consultation (third parties)</b> - All relevant interested parties (building users, existing community, partnerships and networks) have been consulted by the design team. - Stakeholder contributions and consultation outcomes have influenced Initial Project Brief and Concept Design. - Consultation feedback has been given to, and received by, all relevant parties prior to completion of detailed design.
			1	1	BREEAM AP	Time Critical RIBA Stage 2	<b>BREEAM AP (Concept Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. AP is appointed to work with team to maximise project's performance against BREEAM throughout Concept Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
			1	1	BREEAM AP		<b>BREEAM AP (Developed Design)</b> Pre-requisite: Project team, including client, formally agree strategic performance targets early in design process. BREEAM AP (Concept Design) credit must be achieved first. AP is appointed to work with team to maximise project's performance against BREEAM throughout Developed Design, monitor progress against targets, identify risks & opportunities, provide feedback, monitor/coordinate evidence generation.
	Man 02	Life cycle cost and service life planning	2	0	Cost Consultants/ Client	Time Critical RIBA Stage 2	<b>Elemental Life Cycle Cost (LCC)</b> Outline entire asset elemental life cycle cost plan carried out, in line with PD 156865:2008, covering the expected life span of the refurbished building e.g. 20, 30, 50+ years, the servicing strategy for the projects outlining services component over a 15-year period and a fit-out strategy outlining fit-out options over a 10-year period.
			1	0		Time Critical RIBA Stage 4	<b>Component level life cycle costing (LCC)</b> In line with PD 156865:2008 & includes (where present): - Part 1: Envelope, e.g. cladding, windows, and/or roofing - Part 2&3: Services, e.g. heat source cooling source, and/or controls - Parts 1-4: Finishes, e.g. walls, floors and/or ceilings - Where applicable: External spaces, e.g. alternative hard landscaping, boundary protection.  Examples of how the LCC has influenced the design must be given.
			1	1			<b>Capital Cost Reporting</b> in £/sqm At the design stage, where the final information is not available, credit can be awarded where the client provides predicted capital cost, including contingencies, and commits to providing this information for the final stage of assessment.
			✓	✓			<b>Mandatory- All site timber used in the project is sourced in accordance with the UK government's Timber Procurement Policy.</b>



Project Name		Clarendon Centre		<div>Project Notes</div> <div>BREEAM Non-Dom RFO 2014</div> <div>RETAIL PART 1</div> <div></div>			
Project Number		551564					
Date		17/12/2020					
Targeted BREEAM Rating		VERY GOOD	59.03%				
Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue
	Man 03	Responsible construction practices	1	1	Contractor		<b>Environmental Management</b> All parties who control the site site (principal contractor, demo-contractor) operate EMS (ISO14001 or equivalent) for all main operations and best practice pollution prevention in accordance with Pollution Prevention Guidelines PPG6.
			1	1		RIBA Stage 5 - 6	<b>BREEAM AP (site)</b> Pre-requisite: Client and contractor formally agree performance targets. BREEAM AP is appointed to assstist with maximise performance, going beyond design intent, monitor progress against targets, identify risks/opportunities, provide feedback, coordinate generation of evidence.
			2	2			<b>Responsible Construction Management</b> Contractor achieves score between 35 and 38 (one credit) or 39+ (two credits) in a compliant scheme. A score of 7 in each of the 5 sections must be achieved.
			2	2			<b>Monitoring of Construction Site Impacts</b> An individual is appointed to record the utility consumption (energy & water) and transport of construction materials & waste to/from site. Targets must be set and monitored.
	Man 04	Commissioning and handover	1	0		<b>Commissioning building fabric</b> Thermographic survey and airtightness testing	
	0.92%	Total Credit	15	11			
Per Credit	Section Score	13.87%	10.17%				
	Hea 01	Visual Comfort	3	0	Architect/ M&E		<b>Daylighting - up to 3 credits</b> 2% daylight factor across 80% NIFA. Calculations required to confirm feasibility.
			2	2			<b>View out - 2 credits</b> 95% of the relevant building floor area is within 7m of a wall with window and window/opening must be ≥ 20% of the surrounding wall area.





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Project Number		551564							
Date		17/12/2020							
Targeted BREEAM Rating		VERY GOOD	59.03%						
Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed		Responsibility	Completion	Credit Issue	
Health and Wellbeing	Hea 02	Indoor Air Quality	1	0	M&E		<b>Indoor Air Quality Plan</b> a. Removal of contaminant sources b. Dilution and control of contaminant sources c. Procedures for pre-occupancy flush out d. Protection of Heating Ventilation and Air Conditioning (HVAC) systems from sources of pollution during refurbishment/fit-out works e.g. dust e. Procedures for protecting the indoor air quality of areas outside of the refurbishment or fit-out zone that may be affected by the refurbishment/fit-out works f. Procedures for identifying and implementing third party testing and analysis required to ascertain that the contaminant sources have been removed effectively before occupancy g. Commitments for maintaining indoor air quality in-use, e.g. maintenance and cleaning		
			1	0			<b>Ventilation</b> Ventilation pathways minimise build-up of air pollutants. Air intakes must be 10m horizontal distance from building exhausts and other external sources of pollution. HVAC systems incorporate suitable filtration. Variable occupancy areas have CO2 sensors linked to mechanical ventilation system.		
			1	1	M&E		<b>Adaptability- Potential for natural Ventilation</b> Occupied spaces of the building are capable of providing fresh air entirely via natural ventilation. (Met by default for retail if no office space)		
	Hea 04	Thermal comfort	1	0	M&E		<b>Thermal Modelling</b> Thermal modelling has been carried out using software in accordance with CIBSE AM11. Building designed for over heating in accordance with CIBSE TM52.		
			1	0			<b>Adaptability- for a Projected Climate Change Scenario</b> Thermal modelling demonstrates that the building design and services strategy can deliver the same thermal comfort levels, PMV and PPD indices in occupied spaces achieved for the first credit under a projected climate change environment.		
	Hea 05	Acoustic Performance	2	0	Acoustician		<b>Acoustic Report</b> a. Sound insulation b. Indoor ambient noise level		
	Hea 06	Safety and Security	1	0	Architect / ALO	RIBA Stage 2	<b>Security of Site and Building</b> - Suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) including visual audit and the recommendations implemented.		
	1.10%	Total Credit	13	3					
	Per Credit	Section Score	14.34%	3.31%					
Energy	Ene 01	Reduction of Energy Use and Carbon	15	8	M&E		<b>6 Credits Mandatory Excellent</b> <b>Energy Performance NDR</b> Based on improvement in energy performance from existing to proposed building		
	Ene 04	Low Carbon Design	1	0	M&E/ Architect	Time Critical RIBA Stage 2	<b>Passive Design Analysis</b> Thermal modelling credit under Hea 04 has been achieved. Identify opportunities for passive design solutions by Concept Design stage (RIBA Stage 2 or equivalent)		






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			1	0			<b>Free Cooling</b> Analysis of free cooling and implementation opportunities within passive design analysis.
	0.93%	Total Credit	17	8			
	Per Credit	Section Score	15.83%	7.45%			
Transport	Tra 01	Public Transport Accessibility	5	5	Assessor		<b>Accessibility Index</b> Calculate the site's Accessibilty Index (AI) based upon its proximity to transport nodes and the frequencies of services operating.
	Tra 02	Proximity to Amenities	1	1	Assessor		<b>Proximity to Local Amenities</b> Calculate the site's proximity to local amenities.
	Tra 03	Cyclist facilities	1	1	Architect/ M&E		<b>Cycle Storage</b> Provide a compliant number of cycle storage spaces.
			1	0			<b>Cycle Storage</b> Provide at least 2 of the four plausible compliant cyclist facilities.
	Tra 05	Travel Plan	1	1	Architect/Client	Time Critical feasibility and design stage	<b>Travel Plan</b> Developing a travel plan, based upon the findings set out within a travel assessment/statement, incorporating the sustainable measures into the design.
	1.08%	Total Credit	9	8			
	Per Credit	Section Score	9.71%	8.63%			
Materials	Mat 01	Life Cycle Impacts	6	6	Architect		<b>Material Efficiency</b> All new materials specified must be specified with an Environmental Product Declaration (EPD) and as much material re-used as possible.
	Mat 03	Responsible Sourcing of Materials	✓	✓	Architect/ Contractor		<b>Mandatory Criterion - Pre-requisite - All timber used must be "legally harvested and traded"</b>
			1	1			<b>Sustainable Procurement Plan</b> Contractor sources materials in accordance with a Sustainable Procurement Plan (SPP).
			3	2			<b>Responsible Sourcing of Materials</b> Source materials from suppliers holding compliant Responsible Sourcing Certification Scheme (RSCS) Certificates. 1 credit ≥12% 2 credits ≥36% 3 credits ≥54%
	Mat 04	Insulation	1	1	Architect/ Contractor/ M&E		<b>Embodied Impact</b> - Assesses External walls - Ground floor - Roof - Building Services



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Category	Credit ID	Credit Name	Credit(s) Available	Credits assumed	Responsibility	Completion	Credit Issue		
	Mat 05	Designing for Durability and Resilience	1	1	Architect		<b>Protecting Vulnerable Parts of the Building from Damage.</b> Design and specification measures to limit material degradation due to environmental factors e.g. corrosion, rotting, discolouration.		
	Mat 06	Material Efficiency	1	1	Architect/ Contractor	Time Critical RIBA Stage 1, 2, 3, 4, 5	<b>Opportunities, Measures to Optimise the use of Materials</b> Opportunities and measures to optimise the use of materials in building design, procurement, construction, maintenance and end of life have been identified.		
	1.56%	Total Credit	13	12					
	Per Credit	Section Score	20.22%	18.66%					
Waste	Wst 01	Project Waste Management	1	1	Contractor / Demo Contractor	Time Critical RIBA Stage 2	<b>Pre-Refurbishment Audit</b> An audit is carried out by a competent person, prior to the start of works on site, to analyse what materials can be re-used, recycled and predict waste. These should then be compared against actual waste arisings.		
			2	0			<b>Reuse and Direct Recycling of Materials</b> Where waste materials are either directly re-used on-site or off-site or are sent back to the manufacturer for closed loop recycling.		
			3	2			<b>Resource Efficiency</b> Resource management plan including targets: 2 credits: <4.5m3 or <1.2tonnes waste / 100sqm GIFA 3 credits: <2.1m3 or <0.4tonnes waste / 100sqm GIFA		
			1	1			<b>Diversion of Resources From Landfill</b> Non Demo - 70% Volume / 80% Tonnage Demolition - 80% Volume / 90% Tonnage		
	Wst 03	Operational waste	1	1	Architect / M&E		<b>Mandatory Operational Waste - only criteria 1 and 2</b> Where there is a dedicated space to cater for the segregation and storage of operational recyclable waste volumes generated clearly labelled, accessible, of capacity appropriate. Additional conditions are also set for healthcare and multi-residential buildings.		
	Wst 05	Adaptation to Climate Change	1	1	Architect / M&E / Structural Engineer	RIBA Stage 2	<b>Adaption of Climate Change</b> Climate change adaptation strategy appraisal at RIBA Stage 2. Develop recommendations based on appraisal and provide update during technical design on implementation of recommendations.		
	Wst 06	Functional Adaptability	1	1	Architect / M&E / Structural Engineer	Time Critical RIBA Stage 2 & 4	<b>Functional Adaptability</b> A building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design, with measures implemented at the Technical Design, with any omissions justified in writing.		
	1.01%	Total Credit	10	7					
	Per Credit	Section Score	10.11%	7.08%					





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Date		17/12/2020								
Targeted BREEAM Rating		VERY GOOD59.03%								
Category	Credit ID	Credit Name	Credit(s) Available		Credits assumed		Responsibility	Completion		Credit Issue
	LE 04	Enhancing Site Ecology	1		1		Ecologist / Contractor	Time Critical RIBA Stage 2		<b>Ecologist's Report and Recommendations</b> Implementation of the recommendations. - Based on D&A Statement Bird and Bat boxes to be considered along with further ecological enhancements.
	LE 05	Long Term Impact on Biodiversity	2		2		Ecologist / Contractor			<b>Additional Ecology Measures</b> SQE Appointment, Additional Recommendations Implemented and LHMP Developed as Required.
	3.24%	Total Credit	3		3					
	Per Credit	Section Score	9.71%		9.71%					
Pollution	Pol 03	Surface Water Run-Off	2		2		Flood Risk / Drainage Consultant			<b>Flood Resilience</b> 2 Credits Low flood risk 1 Credit for Medium / High Flood Risk
			2		1				<b>Surface Water Run-Off</b> 2 Credits Reducing Run-Off	
			1		0				<b>Minimising Water Course Pollution</b> No discharge from site for rainfall up to 5mm. Appropriate level of pollution prevention using SuDS. Oil separators.	
	1.24%	Total Credit	5		3					
	Per Credit	Section Score	6.22%		3.73%					
Innovation	Man 03	Responsible construction practices	1		0					
	Hea 01	Visual comfort	1		0					
	Ene 01	Reduction of energy use and carbon emissions	1		0					
	Wat 01	Water consumption	2		0					
	Mat 01	Life Cycle Impacts	5		0					
	Mat 03	Responsible Sourcing of Materials	1		0					
	Wst 01	Construction Site Waste Management	1		0					
	Wst 02	Recycled Aggregates	1		0					
	Wst 05	Adaptation to Climate Change	1		0					
	Pol 03	Surface water run off (Simple buildings only)	1		0					
	1.00%	Total Credit	10		0					
	Per Credit	Section Score	10.00%		0.00%					
Overall Credits			92.00		52.00					
Final BREEAM Score			100.30%		59.03%					
BREEAM Rating					VERY GOOD					





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