HOARE LEA

Bishopsgate Goods Yard, Plot 01.
London.
Bishopsgate Goodsyard Regeneration Limited.

SUSTAINABILITY
ENERGY STRATEGY ADDENDUM

REVISION 05 – 26 JANUARY 2024

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	25/09/2023	Initial issue - DRAFT.	C. MacGillivray / R. Palmer	R. Palmer	J. Ford
02	19/10/2023	Comments included.	C. MacGillivray	I. Andrews	J. Ford
03	01/12/2023	Update to floor plans and elevations.	C. MacGillivray	I. Andrews	J. Ford
04	15/12/2023	Final version for planning.	C. MacGillivray	I. Andrews	J. Ford
05	26/01/2024	Update to ambient loop.	C. MacGillivray	R. Palmer	J. Ford

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Contents.

Plot 01 approach.

This Energy Statement has been prepared on behalf of Bishopsgate Goodsyard Regeneration Limited to support the reserved matters application in respect of Plot 1 at Bishopsgate Goodsyard. The ambition for the project is to promote a simple approach to energy efficient and low carbon building that exploits the benefits of current and future technologies, and delivers performance outcomes in practice, minimising carbon emission now and in the future.

The Plot 01 energy strategy approach is based on energy efficient building services systems and controls, and the use of a 5th generation ambient temperature community heat network serving the entire masterplan. Thermal energy will be generated by electrically led air source heat pump technology.

The graph opposite details how the design has been developed in line with the London Plan's Energy Assessment Methodology and Energy Hierarchy. Results presented have been assessed against the updated key building drivers.

Further, the diagram on the following page highlights how sustainable design aspects have been incorporated across the whole site.

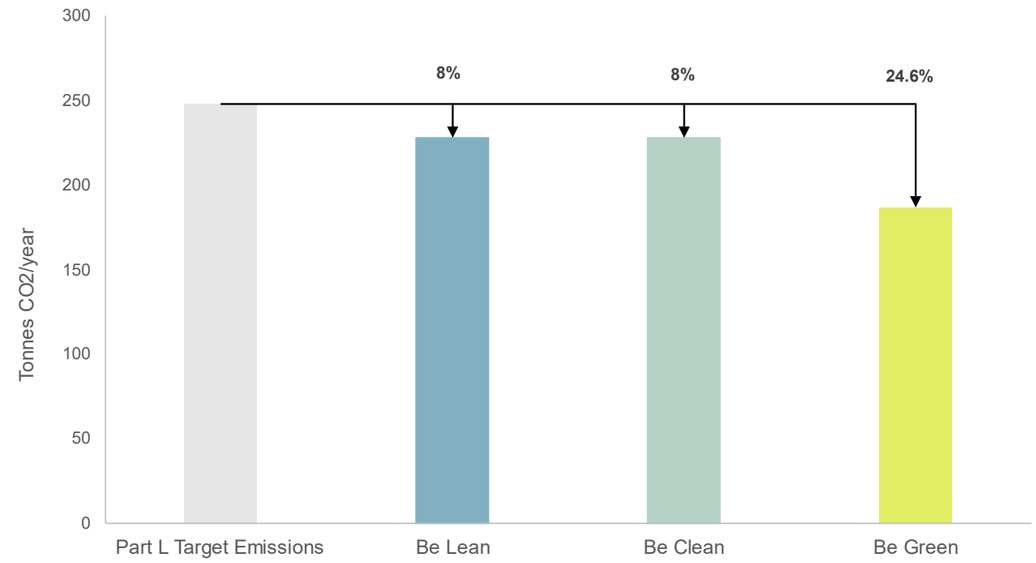


Figure 1: Net zero carbon assessment for Plot 01.

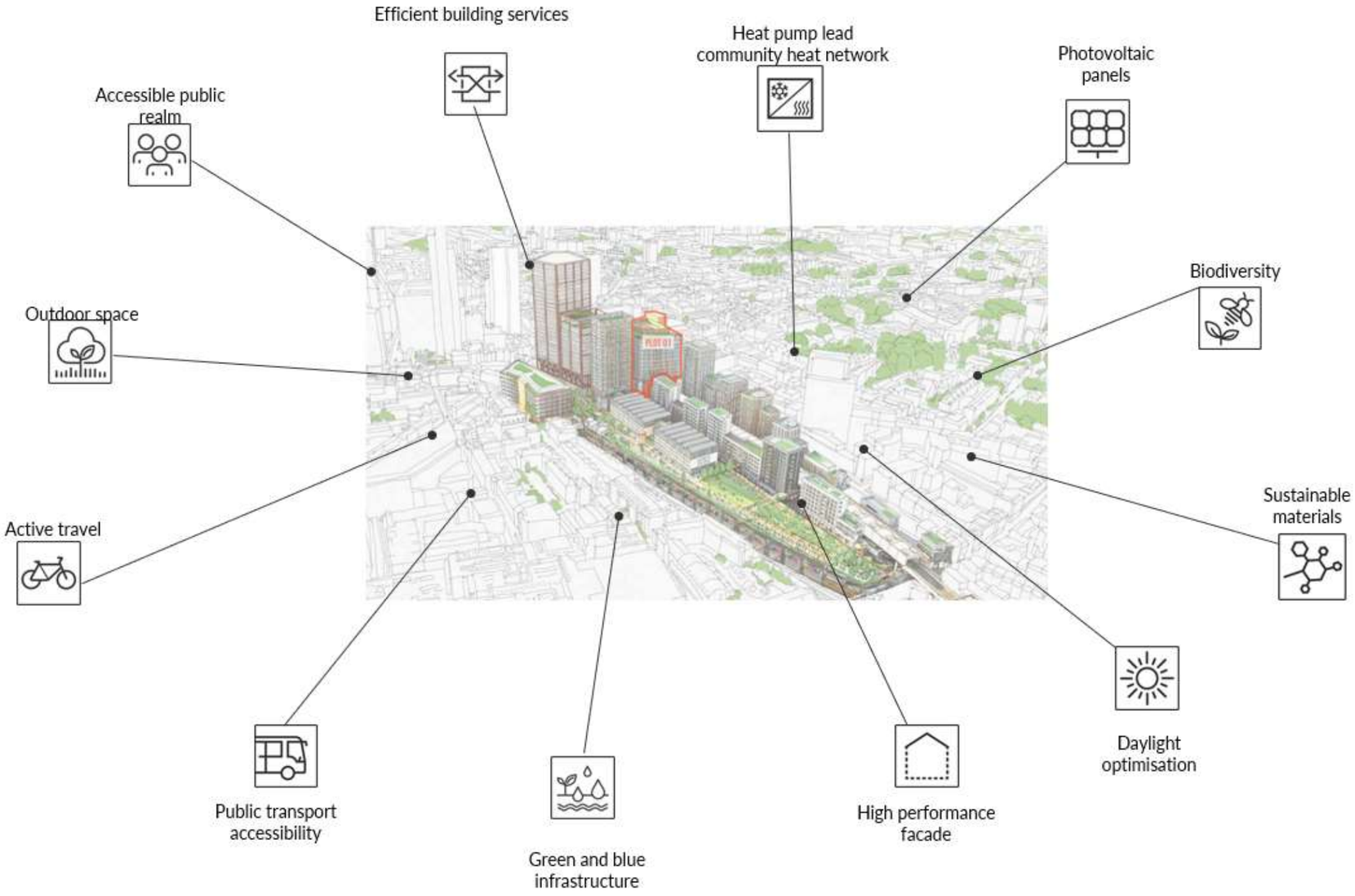


Figure 1: Bishopsgate Goods Yard Sustainability

Summary.

Plot 01 is located within both the Borough of Hackney and Borough of Tower Hamlets, in East London. The proposed scheme will deliver predominantly office space, with retail at ground level.

These non-domestic areas will create a high-quality finish which incorporates 'people centric' design, creating new opportunities for local businesses, alongside ensuring that community cultural spaces are maintained.

The energy strategy for Plot 01 seeks to respond to the climate emergency declared by the Borough of Hackney and Borough of Tower Hamlets by adopting low-carbon design while supporting a wider, holistic and balanced approach to sustainability. The energy strategy for the building is a key part of the approach to sustainability.

The ambition for the project is to promote a simple approach to energy efficient and low carbon buildings, that exploits the benefits of current and future technologies, and delivers performance outcomes in practice, minimising carbon emission now and in the future.

This energy strategy approach is based on energy efficient building services systems and controls, and the use of a 5th generation ambient temperature community heat network served by electrically led air source heat pump.

The Proposed Development is anticipated to achieve up to a 24.60% carbon emission reduction, compared to a notional building baseline, based on the incorporation of a low carbon community network and photovoltaic cells. The approach follows the Greater London Authority (GLA) guidance.

Target emission rate:	257.84 tonnes CO_2/year
Building emission rate:	186.87 tonnes CO_2/year
Percentage variance:	24.6%

The proposed electricity-led strategy will not only demonstrate an emission saving compared to a baseline target at present but will experience continued improvement as the grid continues to decarbonise. Utilisation of a heat pump will also enable the scheme to be combustion free, facilitating a shift towards clean energy systems which also benefit local air quality and human health.

Plot 01 demonstrates a progressive, forward-thinking approach to energy efficient, low-carbon buildings as part of a coherent and holistic approach to sustainability, considering both people and planet.

	**Fabric performance** A 'fabric first' approach has been taken in order to reduce the energy demand and CO_2 emissions from the Proposed Development. The overriding objective for the façade design of each building will be to achieve the optimum balance between providing natural daylighting benefits to reduce the use of artificial lighting, the provision of passive solar heating to limit the need for space heating in winter and limiting summertime solar gains to reduce space cooling demands.
	**Space heating** Low space heating demands are achieved by aiming for optimised building form factors, low fabric u-values and glazing g-values. Heat loss through thermal bridges will be limited through design and construction by the use of approved construction details.
	**Mechanical ventilation** Mechanical ventilation and heat recovery units are to be installed, and high efficiency systems will reduce uncontrolled ventilation in the winter periods. Units installed will have low specifc fan power to reduce electrical energy consumption.
	**Space cooling** A provision for cooling via efficient Variable Refrigerant Flow (VRF) systems and mixed mode ventilation will be supplied to non-domestic retail facilties.
	**Domestic hot water (DHW) system** The Proposed Development will feature water efficient fixtures and fittings including WCs with low flush volumes and flow restrictors on wash hand basins taps and showers to limit overall water consumption in line with the Building Regulations Part G (2013). The building will take advantage of hot water systems fed by centrlaised plant.
	**Natural daylight and lighting strategy.** Artificial lighting tends to provide a significant contribution to regulated CO_2 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. Full lighting control systems including daylight linkage and presence detection will also be incorporated into the design. As well as the reduced energy requirement that will be achieved by implementing these strategies, the contribution to internal heat gains and associated cooling requirements will be reduced. This will further reduce the total energy requirements and CO_2 emissions of the building.

Condition 42 – Energy strategy for Reserved Matters

Each Reserved Matters submission shall be accompanied by an energy addendum which details how it accords with the site-wide Energy Strategy (including with regard to overheating) and demonstrates how the relevant phase / building meets the relevant carbon emission reductions targets. This should also address the policy requirements in place at the time of the reserved matters application. Any addendum shall also demonstrate that:

Responses to the below Condition 42 has been outlined below

1. *The energy efficiency targets (Be Lean) have been achieved.*

Section 5 shows that the Be Lean saving are currently expected to be 9.8% which falls short of this target. The buildings fabric target U-Values match or better the notional buildings 2021 U-values. During 2023 the façade has gone through extensive design improvements façade reviews to reduce the wall to window ratio to the current design of around 40 %. The aim of this is to reduce cooling demand as far as possible but also reducing the need for artificial lighting through the specification of optimized glazing areas and glazing specification with low g-values and high light transmittance.

The Proposed Development will be supplied with high efficiency lighting installations representing best practise. Full lighting control systems including daylight linkage and presence detection will also be incorporated into the design. Lighting efficiencies will improve on those of the notional building

The table below details where the actual design has bettered the values of the notional building at Be Green stage (highlighted in green).

Building Services	Plot 01	Notional Building
DHN Carbon Conversion Factor	0.094 $kgCO_2/kWh$	0.23 $kgCO_2/kWh$
DHN Primary Energy Factor	1.042 kWh_{PE}/kWh	1.05 kWh_{PE}/kWh
System Specific Fan Power (SFP)	1.6 W/l/s	1.8 W/l/s
Fan Coil Unit SFP	0.17 W/l/s	0.3 W/l/s
Heat Recovery	85%	76%
Offices	>120 lm/W	95 lm/W
WC/Circulation/Store Lighting	110 lm/W	95 lm/W
Lighting Controls	Daylight dimming to perimeter office and core office areas with auto-on dimmed. Auto-on off to WCs/circulation, manual to plant rooms	Daylight dimming to perimeter areas. Man-on-off to toilets and Plant spaces, manual controls elsewhere.

2. *The proposed heating strategy for Reserved Matters applications:*

See section 7 for response to this.

3. *The optimal solution in the context of the wider site, considering network flow and return temperatures and connections to earlier and later phases*

See Be Clean and Be Green section for response to this. Details will also will be available in the M&E specification.

4. *Will facilitate the creation of the masterplan site heat network*

See Be Clean and Be Green section for response to this

5. *Will facilitate the future connection to wider heat networks*

See Be Clean and Be Green section for response to this

6. *Will facilitate heat sharing where possible*

See Be Clean and Be Green section for response to this

7. *Solar PV provision has been maximised.*

See Be Green section and Appendix D for further information on this. Solar PV has been maximized as far as possible at this stage.

8. *Where the energy addendum demonstrates that the relevant phase will not comply with the energy reductions targets specified, a carbon offset payment shall be required*

The proposed development will be Net Zero Carbon in line with the London Plan. Emissions not mitigated through the Be Lean, Be Clean, Be Green process will be offset through a carbon offset payment to the Local Broughs of Tower Hamlets and Hackney.

The design with the energy efficiency measures applied is achieving a reduction of 24.6% against Part L 2021 and the 2022 London Plan Guidance.

The savings have been maximized as far as possible noting that The GLA's guidance on the London Plan states that non-domestic buildings may struggle to achieve this target at first but should maximise on site savings, which this project is demonstrating.

An offset payment of £532,580 will be required to be paid to satisfy the requirements of Condition 42 and to achieve net zero.

Executive summary.

The following section provides a summary of the energy strategy for Plot 01 (i.e. the Proposed Development), in support of the reserved matters application.

Details of all reserved matters (Access, Appearance, Landscaping, Layout and Scale) in respect of Plot 1, pursuant to LB Tower Hamlets outline planning permission ref PA/14/02011 (GLA ref. GLA/1200cd/12); LB Hackney planning permission ref. 2014/2427 (GLA reference GLA/1200cd/13) dated 25/03/2022, for the erection of a building comprising office floorspace (Class B1), retail uses (Use Class A1-A5), plant and ancillary space landscaping, public realm, and all associated works." ("the Proposed Development")

Energy strategy summary.

Passive design and energy efficiency measures will provide the cornerstone to the energy demand and CO_2 emission reduction achieved for the Proposed Development.

The baseline scenario, which each step of the energy hierarchy will be compared against, is established by the Part L Target Emission Rate for the notional building simulation as per GLA guidance.

Key drivers.

A policy review has been undertaken and is outlined in Appendix A. As a summary, planning policy applicable to the Proposed Development includes:

National drivers - Approved Document Part L of the Building Regulations.
Part L of the Building Regulations is the mechanism by which government is driving reductions in the regulated CO_2 emissions from new buildings. The assessment of the Proposed Development against policy targets has been carried out using Building Regulations Part L 2021 methodology.

Regional drivers - Greater London Authority (GLA) London Plan (adopted March 2021).
This Energy Strategy follows the Energy Hierarchy set out in the most recent publication of the London Plan. 'Be Lean, Be Clean, Be Green, Be Seen' has been adopted by the Greater London Authority (GLA) London Plan and calculations demonstrating the energy requirements and associated CO_2 emissions for the building have been carried out using Building Regulations approved software in order to comply with Policy SI 2: Minimising Green House Gas Emissions.

Local drivers – London Borough of Hackney Local Plan 2033 (2020).
The Hackney Local Plan Policy 2033 Policy LP55 aims to mitigate the impact of climate change and ensure buildings are resilient, as well as energy efficient. The energy strategy for Plot 01 seeks to respond to the Borough of Hackney's commitment to reducing carbon emissions by 80% by 2050.

Local drivers – London Borough of Tower Hamlets Local Plan 2031 (2020).
The Tower Hamlets Local Plan Policy D.ES7 identifies that sustainable building is essential in good design and seeks to ensure that all new Buildings contribute towards reducing carbon emissions. The energy strategy for Bishopsgate Goods Yard Plot 01 seeks to respond to the climate emergency declared by Tower Hamlets.

Be Lean.

The Proposed Development is anticipated to achieve up to 8.0% reduction in CO_2 emissions beyond the baseline, prior to the consideration of any Low or Zero Carbon (LZC) technologies, i.e. via passive design and energy efficiency measures.

Baseline emissions:	247.84 tonnes CO_2/year
Building emissions:	228.02 tonnes CO_2/year
Percentage variance:	8.0 %

Be Clean.
The feasibility of connection to an existing or proposed district heating network has been reviewed, but no current feasible opportunities have been identified in the vicinity of the building. On-site CHP is also not proposed due to limited carbon reduction potential in light of recent grid decarbonisation and the adverse impact on air quality from flue emissions. Therefore, no additional carbon reductions are anticipated at the be clean stage.

Baseline emissions:	247.84 tonnes CO_2/year
Building emissions:	228.02 tonnes CO_2/year
Percentage variance:	8.0 %

Be Green.
A feasibility assessment of integrating Low or Zero Carbon (LZC) systems has been undertaken to determine a sustainable servicing strategy for the building. An ambient loop community network led by Air Source Heat Pumps (ASHP), has been deemed to be the most suitable option to support the generation of space heating and domestic hot water. In addition, all available roof space will incorporate PV panels to generate renewable electricity on-site.

The inclusion of these low-carbon technologies suggest that the Proposed Development will see a 24.60% reduction in regulated CO_2, compared to the baseline.

Baseline emissions:	247.84 tonnes CO_2/year
Building emissions:	186.87 tonnes CO_2/year
Percentage variance:	24.60%

Be Seen.
The applicant is committed to monitoring and reporting sustainability performance and data every year in a transparent way. The Proposed Development will fall under the applicant's energy and carbon monitoring and reporting regime, which encourages engagement with staff to optimise operational performance. The reported data is committed to being recorded and will be reported appropriately through the GLA's energy reporting mechanisms.

Offsetting.
Residual emissions amount to 186.87 tCO_2 per year for the Proposed Development, this results in an offset fund cost of £532,580.

Building Regulation Compliance & Policy Overview.
Overall, it is anticipated that the proposed development, with the inclusion of passive and active low carbon measures, will achieve a reduction in CO_2 emissions beyond the notional building baseline meaning building regulation compliance is achieved. Carbon efficiency measures and carbon reductions have been maximised on site as required by the London Plan, and the remaining emissions will be offset to achieve net zero carbon.

However, although the energy demand of the proposed development has been minimised as far as practically possible at this stage, the Proposed Development does not satisfy local planning policy requirements and conditions set out within the S106.

1. Introduction.

Hoare Lea has been commissioned by Ballymore, hereafter referred to as 'the Client', to undertake an Energy Strategy report to support the reserved matters planning application for the Plot 01 office, hereafter referred to as 'the Proposed Development' which is located within Shoreditch, London.

1.1 Application site description and location.

Details of all reserved matters (Access, Appearance, Landscaping, Layout and Scale) in respect of Plot 1, pursuant to LB Tower Hamlets outline planning permission ref PA/14/02011 (GLA ref. GLA/1200cd/12); LB Hackney planning permission ref. 2014/2427 (GLA reference GLA/1200cd/13) dated 25/03/2022, for the erection of a building comprising office floorspace (Class B1), retail uses (Use Class A1-A5), plant and ancillary space landscaping, public realm, and all associated works." ("the Proposed Development")

The Proposed Development consists of a mix of office, commercial and amenity spaces.

This assessment focuses on those areas which are the responsibility of the Landlord only within the office and amenity areas.

Table 1: Area schedule for the Proposed Detailed Building.

Space Type	Floor Area (GIA, m^2)
	Plot 01
Non-domestic (excluding retail)	48,227

1.2 Approach to energy.

This Energy Strategy sets out the proposed approach to reducing carbon dioxide (CO_2) emissions and optimising energy performance of the building. 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 and follows the 'Be Lean', 'Be Clean', 'Be Green', 'Be Seen' energy hierarchy.

Figure 2: Energy hierarchy.

Following the adoption of the New London Plan in March 2021, 'Be seen' has been added as an additional stage of the energy hierarchy. 'Be seen', requires Buildings to monitor, verify and report on energy performance in-use for at least 5 years following occupation. The new stage requires the disclosure of the building's energy use with annual energy consumption being displayed on a public online platform accompanied by the predicted energy performance at the design stage.

The 'Be seen' approach will demonstrate how buildings are performing in-use and will underpin progress in reducing carbon emissions, operational running costs and disclosure will aim to encourage the industry's acceleration of achieving zero carbon buildings.

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, this is the amount of energy used of whichever fuel is appropriate (e.g. gas or electricity) to generate useful heat (i.e. the energy demand).
- Regulated CO_2 emissions: The CO_2 emissions emitted as a result of the energy consumption associated with regulated sources (those controlled by Part L of the Building Regulations) of whichever fuel type is appropriate.

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 and external environment may be different from the assumptions made by Part L approved calculation methods leading to differing energy consumption than those experienced in reality.

Figure 3: Bishopsgate Goods Yard site 3D masterplan, highlighting Plot 01.

2. Key Drivers.

As a summary, the national planning policy appliable to the Proposed Development are outlined within this section.

2.1.1 Building Regulations Part L (2021).

Part L of the Building Regulations is the mechanism by which government is driving reductions in the regulated CO2 emissions from new buildings relating to the conservation of fuel and power in buildings.

All new buildings must now meet the requirements of Part L (2021) unless captured by the traditional arrangements associated with the ability to use older versions of the regulations. All new buildings must meet the requirements of Part L1 (Domestic – Dwellings) or Part L2 (Non-Domestic).

The Bishopsgate Goods Yard Plot 01 will be assessed in accordance with criteria set out in Part L2.

Schedule 1: Conservation of Fuel and Power.
Schedule 1 of the Building Regulations Part L (applicable to be domestic and non-domestic Building) states that reasonable provisions shall be made for the conservation of fuel and power in building by:

Limiting heat gains and losses:

- through thermal elements and other parts of the building fabric; and
- from pipes, ducts and vessels used for space heating, space cooling and hot water services.

Providing fixed building services which:

- are energy efficient;
- have effective heat controls; and
- are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances.

The Proposed Development will be assessed in accordance with criteria set out in Part L2A.

Demonstrating compliance – Part L2.
To demonstrate compliance with Part L, Volume 2, there are a number of regulations which must be met. Regulation 25 through to 26C detail the required energy performance of the new building.

Table 2: Part L2 Criteria.

Regulation 25	Minimum energy performance requirements for new buildings These requirements are in the form of a target primary energy rate and a target emission rate.
Regulation 25B	Nearly zero-energy requirements for new buildings Where a building is erected, it must be a nearly zero-energy building
Regulation 26	CO_2 Emission rates for new buildings Where a building is erected, it shall not exceed the target CO_2 emission rate (TER) for the building
Regulation 26C	Target Primary Energy rates for new buildings Where a building is erected, it must exceed the target primary energy rate (TPER) for the building

2.1.2 National Planning Policy Framework.

The updated National Planning Policy Framework (NPPF) was published in July 2021 and was updated in December 2023: it has superseded all Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) documents, with the exception of PPS10 (Waste). The NPPF sets out the Government's strategy on the delivery of sustainable building.

The NPPF places responsibility for policy making with the Local Planning Authority, who shall communicate their policies through Local Plans and facilitate the creation of Neighbourhood Plans. The NPPF states that there is a presumption in favour of sustainable building.

The following is extracted from paragraph 11 of the NPPF:

"Plans and decisions should apply a presumption in favour of sustainable Building.

For plan-making this means that:

a) plans should positively seek opportunities to meet the building needs of their area, and be sufficiently flexible to adapt to rapid change;
b) strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas[5] , unless:
  i. the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for restricting the overall scale, type or distribution of building in the plan area; or
  ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.

For decision-taking this means:

a) approving building proposals that accord with an up-to-date building plan without delay; or
b) where there are no relevant building plan policies, or the policies which are most important for determining the application are out-of-date7, granting permission unless:
  i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the building proposed 6; or
  ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole."

In respect of energy policy contained within the NPPF, paragraph 155 sets out that:

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

a) provide a positive strategy for energy from these sources, that maximises the potential for suitable building, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);

b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their building; and

c) *identify opportunities for building to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers."*

2.2 Relevant Regional, Local and Site-specific Policies.

As a summary of regional, local and site-specific planning policy documents applicable to the Proposed Development have been identified and include the below listed:

- London Plan (March 2021)
- London Borough of Hackney Local Plan 2033 (Adopted 2020)
- London Borough of Tower Hamlets Local Plan 2031 (Adopted 2020)

2.2.1 London Plan (adopted March 2021)

The New London Plan, published March 2021, requires major non-domestic building and rebuilding proposals to submit a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

Within this strategy, it is requested that, as a minimum, it should contain the following information where feasible:

Table 3: Summary of key policies related to energy and carbon – London Plan 2021.

Policy reference	Overview – London Plan

Policy SI 2	Minimising greenhouse gas emissions
	– The energy strategy should be developed to follow the following energy hierarchy:
	  – Be Lean
	  – Be Clean
	  – Be Green
	  – Be Seen
	– non-residential building should achieve 15% reduction through energy efficient measures (i.e. Be Lean stage);
	– minimum on-site reduction of carbon emissions by at least 35% beyond building regulations;
	– where 100% reduction cannot be demonstrated on site, shortfall should be provided as agreed with the local borough through cash in lieu contribution;
	– proposals stating how the site will be future-proofed to achieve net zero carbon by 2050;
	– major building proposals should calculate and minimise unregulated carbon emissions;
	– overheating modelling should be undertaken in line with CIBSE TM59 guidance;
	– whole life cycle carbon emissions to be reported;

Policy SI 4	Managing heat risk – Buildings should minimise adverse impacts of the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure. – Major building proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the cooling hierarchy.

2.3 Local drivers – London Borough of Hackney Local Plan 2033 (2020)

The Hackney Local Plan Policy 2033 aims to mitigate the impact of climate change and ensure buildings are resilient, as well as energy efficient.

The plan sets out a vision for what Hackney will be like in 2033 and the planning policies to guide and manage Building and investment in the Borough. It aims to help Building serve the needs of the borough and allow the Council and local people to influence building. Additionally, it aims to ensure that the right amount of building is built in the right place.

The key targets associated with sustainability as set out in Hackney Local Plan (Adopted July 2020), are as follows:

- Policy LP 46 – Protection and Enhancement of Green Infrastructure
- Policy LP 48 – New Open Space
- Policy LP 53 – Water and Flooding
- Policy LP 54 – Overheating and Adapting to Climate Change
- Policy LP 55 – Mitigating Climate Change
- Policy LP 56 – Decentralised Energy Networks (DEN)
- Policy LP 57 - Waste
- Policy LP 58 – Improving the Environment – Pollution

With particular relevance to the study undertaken within this report Policy LP 55 *Mitigating Climate Change* and LP56 *Decentralised Energy Networks (DEN)* states that;

Policy LP55;

> A: All new Buildings in Hackney must actively seek to mitigate the impact of climate change through design which minimises exposure to the effects, and technologies which maximise sustainability.
>
> B: All new residential Building should meet a zero carbon emission target emission rate in line with the London Plan energy hierarchy and Sustainability and the Built Environment SPD.
>
> C: All non-residential Buildings must achieve the BREEAM 'Excellent' rating (or an equivalent rating under any other system which may replace it) and where possible achieve the maximum number of water credits, and must be built to be zero-carbon.
>
> D: In reducing carbon emissions, residential Building should aim to achieve 10% and non-residential Building should aim to achieve 15% through energy efficiency measures alone.
>
> E: Major commercial Building should generate at least 10% of their energy needs from renewable sources onsite or in the local area, where this is consistent with the London Plan energy hierarchy and energy infrastructure policies.
>
> F: The design, construction and operation of new buildings should be informed by the London Plan energy hierarchy.
>
> G: Where it can be robustly demonstrated that it is not possible to reduce CO_2 emissions on-site by the specified levels, carbon off-setting payments will be required and secured via legal agreement.

Policy LP56;

> A: All Buildings should maximise opportunities to incorporate decentralised energy to support reductions in energy use and emissions.
>
> B: New major Building should connect to an existing network; unless it is clearly demonstrated that it is not technically feasible or economically viable.
>
> C: Only when it can be clearly demonstrated that all options to link into existing schemes have been explored should Building provide on-site DEN. Buildings should be designed to connect to other Buildings at a later date.
>
> D: Where there is a planned DEN within feasible and viable range of future connection, proposed major Buildings should be designed to connect to that network.

2.4 Local drivers – London Borough of Tower Hamlets Local Plan 2031 (2020)

This Tower Hamlets Local Plan (adopted January 2020) sets out how the Borough will manage growth and ensure shared benefits with all residents through to 2031. It identifies how many new homes, jobs and services are needed to support our growing population, and where and how they should be provided. It will also aims to influence the way that local communities interact with each other and the spaces around them.

The plan provides a series of policies to ensure Building is well-designed, accessible, safe and respects and enhances the environment, and can be delivered alongside new infrastructure and local services.

The key targets associated with sustainability as set out in Tower Hamlets Local Plan are as follows: D.ES7: A zero carbon borough, S.TR1: Sustainable travel, D.SG3: Health impact assessments, D.ES2: Air quality, D.ES9: Noise and vibration, D.ES10: Overheating, S.ES1: Protecting and enhancing environment, D.ES3 Urban greening and biodiversity, D.ES4: Flood risk, D.ES5: Sustainable drainage, D.ES6: Sustainable water and wastewater management, D.DH2: Attractive streets, spaces and public realm, D.OWS3: Open space and green grid networks.

With particular relevance to the study undertaken within this report Policy D.ES7 *A zero carbon borough* states that;

Policy D.ES7

1. Improvement on the 2013 building regulations: Zero carbon (to be achieved through a minimum 45% reduction in regulated carbon dioxide emissions on-site and the remaining regulated carbon dioxide emissions to 100% - to be offset through a cash in lieu contribution). This is for both residential and non-residential Building.
2. Building is required to maximise energy efficiency based on the following standards:
    a. All new non-residential Building over 500 square metres floorspace (gross) are expected to meet or exceed BREEAM 'excellent' rating.
    b. All major non-residential refurbishment of existing buildings and conversions over 500 square metres floorspace (gross) must meet at least BREEAM non-domestic refurbishment 'excellent' rating.
    c. As a minimum, all self-contained residential proposals will be strongly encouraged to meet the Home Quality Mark.
3. Major residential and major non-residential Building will be required to submit an energy assessment. Minor non-residential Building will be strongly encouraged to prepare an assessment.
4. The energy assessment should demonstrate how the building has been designed in accordance with the energy hierarchy and how it will:
    a. maximise energy efficiency as per the requirements set out in Part 2
    b. outline the feasibility of low nitrogen dioxide decentralised energy, and
    c. seek to provide up to 20% reduction of carbon dioxide emissions through on-site renewable energy generation.
5. The sustainable retrofitting of existing building with provisions for the reduction of carbon emissions will be supported.

2.5 Condition 42 – Energy strategy for Reserved Matters

Each Reserved Matters submission shall be accompanied by an energy addendum which details how it accords with the site-wide Energy Strategy (including with regard to overheating) and demonstrates how the relevant phase / building meets the relevant carbon emission reductions targets. This should also address the policy requirements in place at the time of the reserved matters application. Any addendum shall also demonstrate that:

1. *The energy efficiency targets (Be Lean) have been achieved.*
2. *The proposed heating strategy for Reserved Matters applications:*
3. *The optimal solution in the context of the wider site, considering network flow and return temperatures and connections to earlier and later phases*
4. *Will facilitate the creation of the masterplan site heat network*
5. *Will facilitate the future connection to wider heat networks*
6. *Will facilitate heat sharing where possible*
7. *Solar PV provision has been maximised.*

Where the energy addendum demonstrates that the relevant phase will not comply with the energy reductions targets specified, a carbon offset payment shall be required

3. Assessment Methodology.

The following is a summary of the data used and inputs / assumption made for simulation geometry modelling.

3.1 Site Context

The site, highlighted below, is located in Shoreditch and is situated between the A10, A1209 and the Rail line.

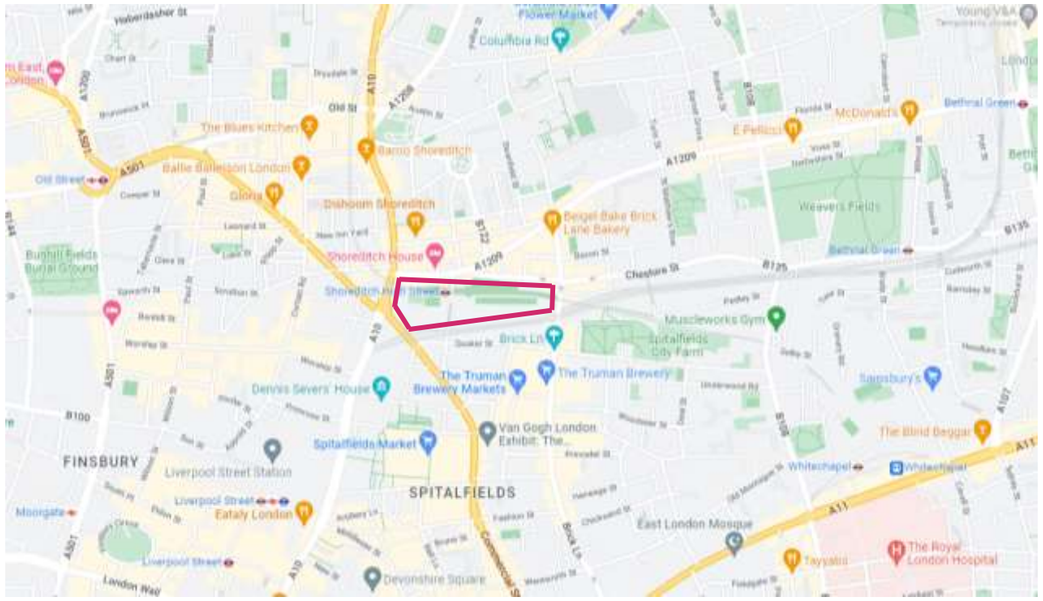


Figure 4: Location of the Bishopsgate Goods Yard Plot 01 Building with respect to the surrounding area.

Surrounding existing and Proposed Developments which will impact the Proposed Development have been incorporated into the model in order to more accurately model the local environment in which the building will sit.

3.2 Site location and weather data.

A building's thermal performance is its response to external environmental conditions. The more dependant a building is on passive features to achieve acceptable internal comfort, the more important the use of external weather information becomes.

Climate data is assigned to the virtual environment of the dynamic model to simulate external weather conditions that are likely to occur. Thermal comfort calculations require the simulation to be tested against CIBSE Design Summer Year (DSY) climate data in order to best assess how spaces will perform during a year with hot summer conditions.

The UK Meteorological Office (MO) collects weather data at stations across the UK. Climate variables measured at hourly intervals include air temperatures, wind speed and direction and air pressure amongst various other characteristics.

CIBSE licenses the historic weather data from the MO for 14 locations in the United Kingdom: Belfast, Birmingham, Cardiff, Edinburgh, Glasgow, Leeds, London (3 sites), Manchester, Newcastle, Norwich, Nottingham, Plymouth, Southampton and Swindon.

The weather variables are synthesised into 2 types of CIBSE weather file:

- Design Summer Year (DSY): 2006 and 2016
  The DSY is a single continuous year rather than a composite one made up from average months.
  The DSY is used for overheating analysis.

- Test Reference Year (TRY): 2006 and 2016
  The TRY is composed of 12 separate months of data each chosen to be the most average month from the collected data.
  The TRY is used for operational energy analysis and for compliance with the UK Building Regulations (Part L).

Following the standardised methodology behind the Part L requirements, the closest CIBSE weather file location for the Proposed Development is the London TRY (2016) and has been utilised for the purposes of these calculations.

3.3 Architectural drawings.

The geometry used to assess the Proposed Development was determined by the following information received.

This list details the information our models have been developed from. Please note whilst the plans from 22.11.2023 have been used only the office areas have been amended. The toilet and core areas have altered slightly in some areas but have been deemed a minor alteration that would not impact the accuracy of results presented.

Table 4: Architectural Information.

Drawing Type	Document Package	Date Received
GA drawings / Elevations	Plot 01 GAs & Elevations	09/12/2022
GA drawings	Plot 01 Updated Gas	22/12/2022
Elevations	Plot 01 Gensler Draft St2 Elevations	23/01/2023
Façade updates	Plot 01 BGY Opaque Glazing Elevations	22/11/2023
Plans / Elevations	Plot 01 Gensler RMA Plans	22/11/2023

3.3.1 Dynamic Simulation Model.

Based on the information above a series of Dynamic Simulation Models were created to undertake appropriate assessments on the proposed design.

Integrated Environmental Solutions Virtual Environment (IESve) is an approved Dynamic Simulations Modelling (DSM) software package that has the capabilities of enabling the user to create a virtual representation of a building.

Models built in the IESve have been used to consider compliance with Approved Document Part L2 2021 using the National Calculation Methodology alongside the assessment of operational energy consumption.

The DSM model, with simplified versions of the surrounding buildings, is displayed in Figure 5.

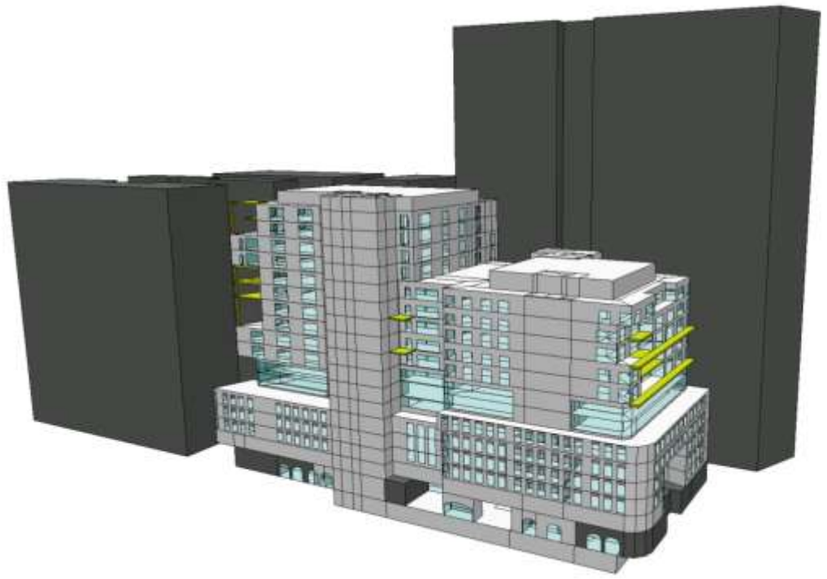


Figure 5: BGY Plot 01 DSM Model Image.

3.4 Building Fabric Specification.

Optimising the building's fabric is seen to be the most robust and effective way to improve energy efficiency and in turn reduce carbon emissions whilst also impacting thermal comfort.

The performance of the envelope (i.e. material performance) is unlikely to deteriorate significantly with time and therefore the benefits of these measures will continue at a similar performance for the duration of their installation.

The current values used are as indicated by the architects and the fabric performance parameters are detailed below.

Table 5: Fabric Performance.

Parameter	Part L (2021) Limiting Values	Part L (2021) Notional Values	BGY Plot 01*
Floor U-value (W/m^2.K)	0.18	0.15	0.11
Floor to Tunnel U-value (W/m^2.K)			0.18
L00-01 External wall U-value (W/m^2.K)	0.26	0.18	0.13
L02-04 External wall / Heat Loss Tunnel U-value (W/m^2.K)			0.19
L05-L16 Opaque Elements			0.18
L00-01 / L02-04 Glazing U-value (W/m^2.K)	1.60	1.40	1.10
L05-L15 Glazing U-value (W/m^2.K)			1.20
Glazing g-value	0.4	0.29	0.32
Glazing Light Transmittance	71%	60%	71%
Flat Roof U-value (W/m^2.K)	0.18	0.15	0.11
Door U-value (W/m^2.K)	1.60	1.60	1.60
Air permeability at 50 Pa	8.00 m^3/(h.m^2)	3.00 m^3/(h.m^2)	3.00 m^3/(h.m^2)

*Thermal bridges have been deemed to increase u-values by 10%.

Please note that thermal bridging calculations will be required at future stages in order to demonstrate that thermal bridging losses are ~10% and comply with the requirements of Part L2a 2021.

Figure 6: Plan of Level 01.

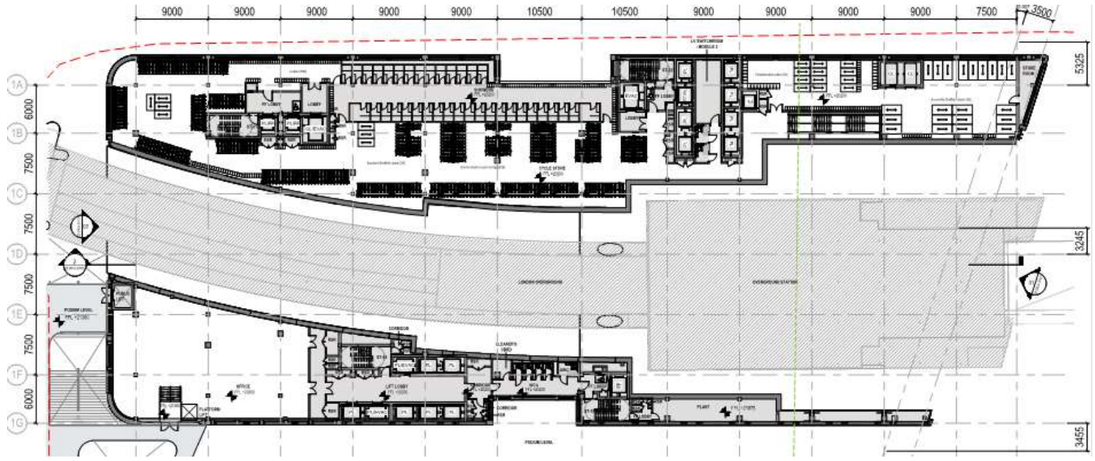
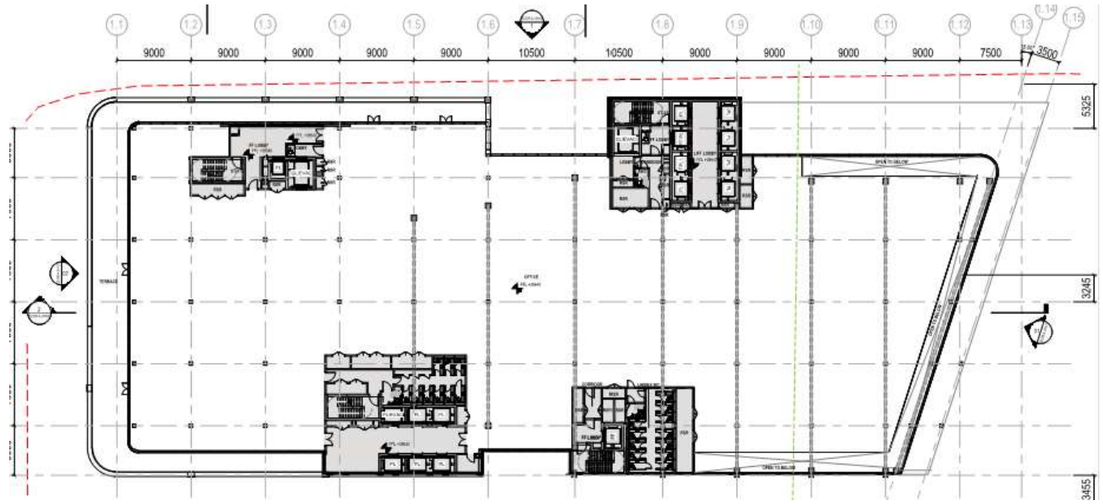


Figure 7: Plan of Level 06.



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 building.

Figure 8: Be Lean.

4.1 Passive design and energy efficient 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_2 emissions as the performance of these solutions, such as façade insulation, are 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 will continue at a similar level for the duration of their installation.

	Fabric performance A fabric first approach has been taken in order to reduce the energy demand and CO_2 emissions from the Proposed Development. The overriding objective for the façade design of each building will be to achieve the optimum balance between providing natural daylighting benefits to reduce the use of artificial lighting, the provision of passive solar heating to limit the need for space heating in winter and limiting summertime solar gains to reduce space cooling demands.
	Space heating Low space heating deamnds are achieved by optimised building form, low fabric u-values and considered glazing g-values. Heat loss through thermal bridges to be minimised through design and construction. The architecture team have put in a significant amount of work in optimising the façade window to wall ratios and improving the fabric performance of the building in order that space hating demands are limited. The buildling is served by high efficiency Fan Coil Unit systems.
	Mechanical ventilation Mechanical ventilation and heat recovery units are to be installed, and high efficiency systems will reduce uncontrolled ventilation in the winter periods. Units installed will have low specific fan power to reduce electrical energy consumption.
	Space cooling Office accommodation will incorporate air source heat pump led cooling via efficient Fan Coil unit Systems. Space cooling demands have been limited by reduced window to wall glazing ratios and upgraded fabric parameters. A provision for cooling via efficient Variable Refrigerant Flow (VRF) systems and mixed mode ventilation will be supplied to non-domestic retail facilities.
	Domestic hot water (DHW) system The Proposed Development will feature water efficient fixtures and fittings including WCs with low flush volumes and flow restrictors on wash hand basin taps and showers to limit overall water consumption, in line with the Building Regulations Part G (2013). Hot water is generated for spaces with showers via a cascade water source heat pump to air source heat pump system; the rest of the building is supplied by an electric point of use system.
	Natural daylight and lighting strategy Artificial lighting tends to provide a significant contribution to regulated CO_2 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. Full lighting control systems including daylight linkage and presence detection will also be incorporated into the design. As well as the reduced energy requirement that will be achieved by implementing these strategies, the contribution to internal heat gains and associated cooling requirements will be reduced. This will further reduce the total energy requirements and CO_2 emissions of the building.

Table 6: Be Lean Summary.

4.2 Be Lean results.

The results presented below are based on indicative Building Regulations Part L2 2021 assessments.

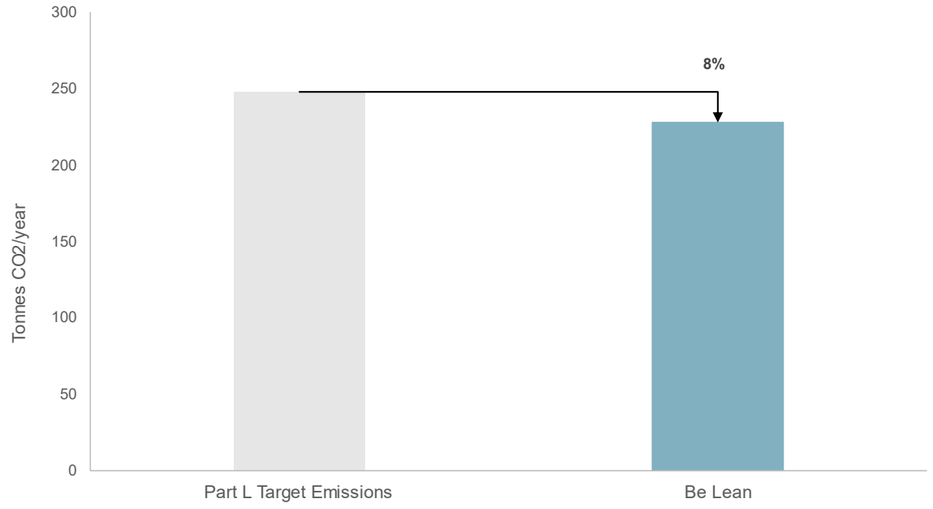
Overall, Plot 01 is anticipated to achieve up to an 8.0% reduction in annual regulated CO_2 emissions beyond the Part L 2021 baseline via passive design and energy efficiency measures (i.e. before any benefit from low or zero carbon technologies).

The results detailed below for the 'Be Lean' assessment demonstrate the percentage variance against Approved Document Part L2 of the Proposed Development.

Table 7: Anticipated Be Lean BGY Plot 01 regulated carbon reduction.

Building Emissions:	247.84 tonnes CO_2/year
Baseline Emissions:	228.02 tonnes CO_2/year
Percentage Reduction:	8.0 %

Figure 9: Be Lean results summary for Plot 01.



The Proposed Development energy demand has been minimised as far as reasonably practical at this stage. However, despite an 8.0% improvement against the Part L 2021 baseline, the Proposed Development does not satisfy planning policy requirements of a 15% improvement against the Part L 2021 baseline.

4.3 Cooling demand.

The table below compares the cooling energy demand of the actual building against a notional building built to Part L2A parameters, indicating that the cooling demand is worse than the notional building by approximately 9%.

Table 8 Be Lean Cooling Demand Reduction

Space Use	Notional Building	Actual Building
Cooling demand (MJ/m^2/year)	85.39	94.30

5. Be Clean.

This stage of the energy hierarchy includes consideration of connection to available district heat networks, or the use of on-site heat networks and decentralised energy production such as Combined Heat and Power (CHP) in order to provide energy and reduce consumption from the national grid and gas networks, through the generation of electricity, heating and cooling on-site.

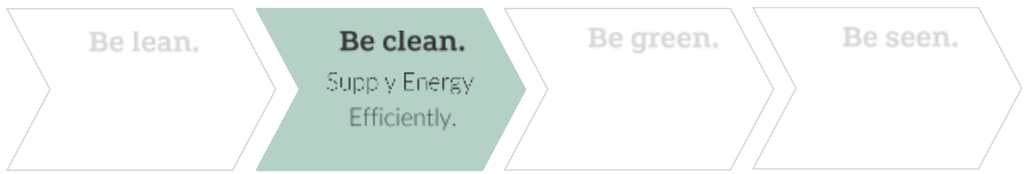


Figure 10: Be Clean.

5.1 District/decentralised heat network.

The majority of central London is identified as a Heat Network Priority Area, i.e. area where heat density is sufficient for heat networks to provide a competitive solution for supplying heat to buildings and consumers. It is shown in the London Heat Map that the Proposed Development is located within an area which could provide a suitable future connection (http://www.londonheatmap.org.uk).

However, development of the Shoreditch South Proposed Network is possibly too early stage to be considered for this development currently. Discussions with the local council are ongoing (Appendix E).

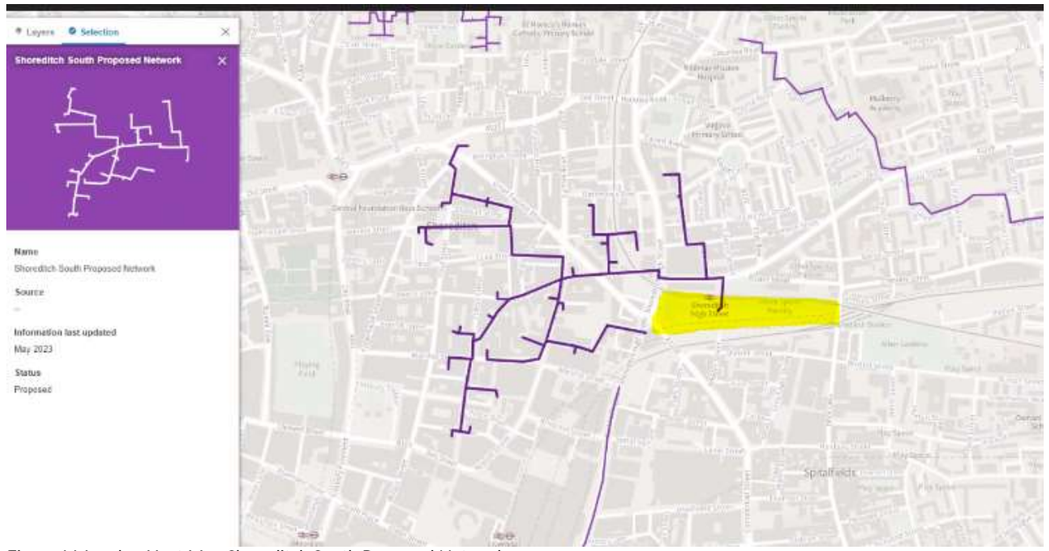


Figure 11 London Heat Map Shoreditch South Proposed Network

In exploring other current opportunities, there are numerous factors that limit the opportunity to connect to a DHN, specifically:

- No DHN existent in feasible proximity to the Bishopsgate Goods Yard Plot 01 site.
- There are two proposed networks (LB Tower Hamlets and Proposed City 2 heat networks), however these are deemed not to be in close enough proximity to the Bishopsgate Goods Yard Plot 01 site.
- No programme for Building of the heat network in close proximity.
- Major infrastructure obstacles between future proposed network and building location, including railway.
- Gas led heat network would have higher carbon intensity than grid electricity and no route to future decarbonisation currently.
- Combustion based heat network would be a detriment local air quality.

This being said, the Proposed Development looks to take advantage of a site-wide community heat network. The loop will connect all plots on the Bishopsgate Goods Yard site, allowing energy to be shared across the building, reducing the primary energy needed to meet the site-wide heating and cooling demands at any given time. This will be discussed further in the Be Green section of the report.

5.2 Combined heat and power (CHP).

Changes to the carbon factor of grid electricity have meant that previously favoured systems such as Combined Heat and Power (CHP) are becoming much less carbon efficient. In fact, CHP systems are now expected to lead to greater carbon emissions than conventional gas-fired boilers due to their lower thermal efficiency.

Due to the decarbonisation of the electricity grid, schemes using CHP engines for the delivery of thermal energy will lead to a net increase carbon emissions (over the gas boiler baseline and certainly when compared to electrically fuelled heat pump systems). Based on indicative calculations on other schemes, if a CHP were to be utilised for the Proposed Development, a regulated CO_2 emission increase of ~10% over the Be Lean stage would be demonstrated and it is for this reason that CHP, or connections to a DHN fed by CHP, are not proposed.

Furthermore, CHP engines are an on-site source of particulate pollutants which will adversely affect local air quality. In light of grid decarbonisation and increased focus on air quality in the London Plan, CHP is therefore not proposed.

5.3 Be Clean summary.

No existing connection opportunities to existing district heating networks in the vicinity of the site have been identified.

Opportunities for future connection to any proposed low carbon district heating network not currently available. CHP is not proposed due to poor carbon reduction and adverse air quality impacts.

Therefore, no further carbon reductions are envisaged for the Be Clean stage of the energy hierarchy.

Table 9: Anticipated Be Clean BGY Plot 01 regulated carbon reduction.

Building Emission Rate:	247.84 tonnes CO_2/year
Baseline emission rate:	228.02 tonnes CO_2/year
Percentage Reduction:	8.0 %

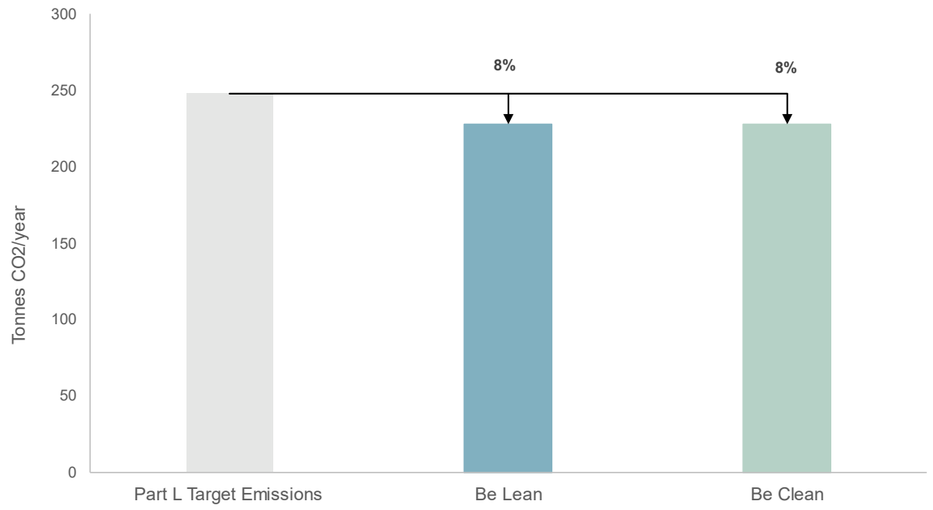


Figure 12: Be Clean results summary for Plot 01.

6. Be Green.

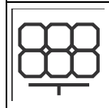
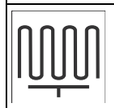
This section explores the feasibility of Low and Zero Carbon (LZC) technologies to allow the production of renewable energy onsite in order to deliver further reduction in carbon emissions.

Figure 13: Be Green.

6.1 Low and zero carbon (LZC) technology assessment.

Renewable 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 urban locations.

As identified within the Be Clean section above, there are no feasible existing or proposed district heat networks in close proximity to the building. Therefore, the site will implement its own community heat network served by centralised plant. The proposed network will be a 5th generation network at ambient temperature to reduce distribution heat losses and allow energy sharing opportunities between buildings.

	**Ground g heat pumps** Ground Source systems work to extract heat or cooling energy from the ground. They are generally slightly more efficient than air source systems, as the ground temperature is more stable over the course of the year relative to air temperature. There are four common varieties: – Vertical, open loop, direct cooling (i.e. without heat pump) – Vertical, open loop, with heat pump – Horizontal, closed loop, with heat pump – Vertical, closed loop, with heat pump Suitability to Proposed Development: Regardless of the type of ground source heat loop used, all would require extensive below ground works to bury and install the system on site. A ground test would need to be undertaken to determine whether the site's ground conditions would be able to support a sufficient number of piles to provide for the heating demand of the project. Therefore, this technology could be incorporated within the strategy to serve the ambient temperature community heat network, however it is not included within the current proposal.
	**Water source heat pumps** Water source heat pumps use bodies of water, such as rivers, lakes or oceans to provide heating or cooling energy to a building. Suitability to Proposed Development: There is no body of water suitable to use that is located close to the Proposed Development. Therefore, this technology has not been included within the centralised strategy.
	**Air source heat pumps** Air source heat pumps (ASHP) use thermodynamic principles to convert heat from the air into useable heat within the building. Unlike some other sources of renewable energy, heat pumps do require energy (typically electricity or gas) to pump and compress refrigerant through the system. However, under the Renewable Energy Directive 2009/28/EC they are classified as renewable technologies provided that the final energy output significantly exceeds the primary energy input required to drive the heat pump. ASHP need to be located externally with access to the ambient air, typically at roof level. Suitability to Proposed Development: Due to grid decarbonisation and the updated carbon factors, it is expected that ASHP technology will offer significant carbon emission reductions over the baseline scenario. ASHP plant can be located at roof level and integrated into space heating and hot water systems (albeit potentially with some degree of ancillary top-up heating to raise water temperatures). Implementing heat-pump technology brings the additional benefit of a shift towards combustion-free building, with the associated benefit to local air quality. This approach is expected to result in significant regulated CO_2 emission reductions beyond the Building Regulations Part L (2021) 'baseline' on a site-wide basis. Air Source Heat Pumps are therefore proposed for the building as the primary heat generating technology serving the ambient temperature community heat network and the building's Fan Coil Unit systems.
	**Photovoltaics** Photovoltaic panels harness energy from sunlight and convert this into useful energy in the form of electricity. A PV system requires viable roof space in order for the system array to be installed and function effectively. Suitability to Proposed Development: Solar irradiance analysis on the site has shown a good opportunity for the implementation of Photovoltaic technologies for on-site electricity generation. The provision and location of PV panels has been reviewed in detail, with consideration of the following aspects: - Overshading and orientation, - Area required for access and for roof mounted plant (e.g. ASHPs) PV panels are therefore proposed for the building and will be incorporated at rooftop level to provide onsite electricity generation. Of a potential 750 m^2 of available roof space, 375 m^2 (50%) has been included for solar PV capable of generating ~56,000 kWh/annum.
	**Solar thermal** Solar Thermal Panels are similar to PV Panels in that they harness energy from solar energy. This technology however converts solar energy into thermal energy that can offset the demand on hot water generation systems. Suitability to Proposed Development: Given the Proposed Developments use connection to the community heat network for domestic hot water generation where deemed applicable, solar PVs would be prioritised since the electrical output from PV panels will be more suitable for implementation with the heat-pump led energy strategy and building energy usage. Therefore, solar thermal is not proposed for the building.

	**Wind turbine** For efficient operation and to yield high energy output, wind turbines require a consistent flow of air to generate electricity using wind energy. Suitability to Proposed Development: 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 from a turbine. Moreover, mounting wind turbines on the roof of the building could result in unacceptable vibration and resonance being felt within occupied spaces. The turbines are also likely to generate noise which may be a nuisance to neighbouring buildings. Therefore, given the complexities of installing this technology, the use of wind turbines is not proposed at the Proposed Development.
	**Biomass** Biomass boilers burn wood fuel or other bio-fuel sources to generate heat. These boilers can operate at high efficiencies, comparable to condensing gas boilers. However, they require a large fuel store to maintain continuous operation during the winter months. As such, area take for such plant is high. Furthermore, fuel deliveries in city-centre locations can prove difficult and security of fuel supply is an important consideration. Suitability to Proposed Development: The reasons listed above alongside high maintenance implications and air quality implications mean that biomass boilers are not considered a suitable technology for the scheme. Therefore, given the implications associated, the use of biomass boiler technology is not proposed at the Proposed Development.

Table 10: Be Green Summary.

From a carbon perspective, the favoured technologies would be a form of air source heat pumps and PV panels.

Thermal Energy Generation.

The Proposed Development looks to take advantage of a site-wide ambient loop. The loop will connect all plots on site, allowing energy to be shared across the building, reducing the primary energy needed to meet the site-wide heating / cooling demand at any given time.

The proposed low carbon community network is a 5th generation ambient temperature loop. It can be served by air source heat pump technology.

The benefit of an ambient loop on a large scheme such as Bishopsgate Goods Yard is that Plot 01 will have a varying demand profile to other plots on the site. This allows the office buildings such as Plot 01 to inject heat into the loop during the day whilst operating in cooling mode. In this scenario, the ASHP connected to the ambient loop would operate at a much-reduced load to stabilise the temperature in the loop, effectively acting as a top-up, as the energy within the loop is predominantly provided from the balance of demand across the building, providing “free” energy.

Being such a dynamic and complex system with varying demands and temperatures, it is very difficult to calculate the benefit that this “free” exchange of energy has on the overall system efficiency. Additionally, approved Part L calculation software (used to undertake the calculations in this report) do not include input options to demonstrate the benefits of an ambient loop. However, it should be noted that we envisage the actual on-site energy loop to operate at a much-improved overall efficiency to the figures stated within the software inputs section of this report, which will bring further benefits to the “Be Clean” energy strategy approach to those tabled herein.

Bishopsgate Goods Yard Plot 01 will be connected to the ambient temperature loop via plate heat exchanger. Energy delivered to the building will be used in support of space heating, space cooling, and hot water generation.

6.2 Be Green summary.

For Bishopsgate Goods Yard Plot 01, the adoption of an ASHP led ambient district heat network and roof mounted PV array able to generate approximately 56,000kWh per year contributes to a reduction in carbon emissions of 24.60% at the Be Green stage. Proposed location of PV can be found Appendix D.

Table 11: Anticipated Be Green BGY Plot 01 regulated carbon reduction.

Building Emissions:	247.84 tonnes CO_2/year
Target Emissions:	186.87 tonnes CO_2/year
Percentage Reduction:	24.60%

Using Part L (2021), the building is anticipated to achieve a 24.60% betterment over the notional baseline. This result is in compliance with Part L2A Building Regulations; however, this reduction does not satisfy planning policy which requires a 35% betterment against a GLA 2022 heat pump baseline.

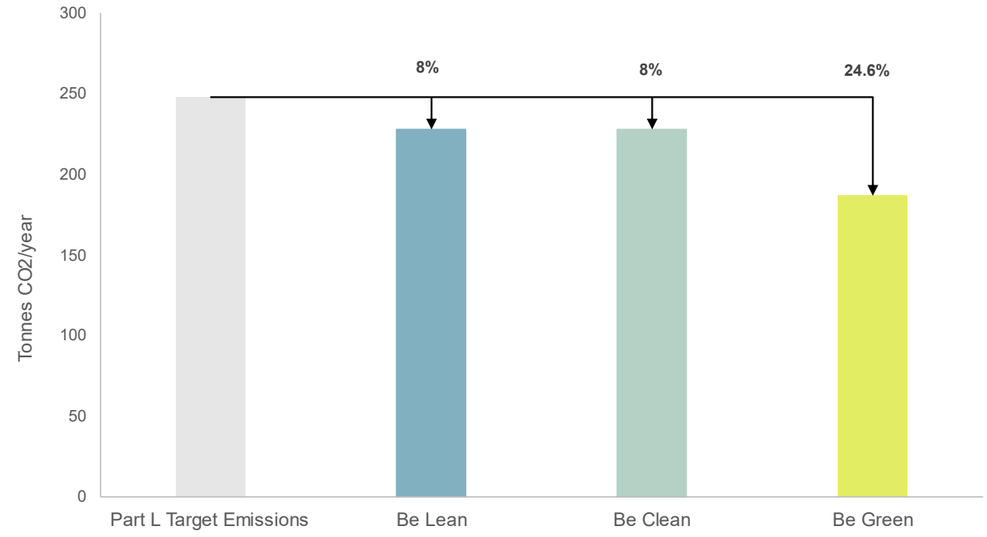


Figure 14: Be Green summary for Plot 01.

7. Be Seen.

The final section of the strategy considers additional measures that will be adopted during operation to ensure the risk of a performance gap is reduced and high levels of energy performance are maintained throughout the Proposed Development's lifetime.

Figure 15: Be Seen.

7.1 Metering and monitoring.

Effective energy metering will be enabled by the provision of suitable infrastructure within the building services systems. This will enable energy usage of the central and local plant systems to be monitored, and the system performance optimised. Electrical and thermal meters will be provided on the main central plant, providing data on plant energy consumption throughout the year.

Each tenant area and each area of high energy load will be sub-metered in order to monitor energy consumption in greater granularity and facilitate billing and reporting. Energy intensity and carbon emissions will be monitored and reported annually.

7.2 Reporting mechanism.

The Applicant is committed to monitoring and reporting sustainability performance and data every year in a transparent way. The Proposed Development will fall under the Applicant's energy and carbon monitoring and reporting regime, which includes both landlord and tenant usage and encourages engagement with tenants to optimise operational performance.

Through installing a comprehensive metering strategy across the building, the Applicant will ensure that ongoing monitoring of energy consumption values will be undertaken, and will therefore make a commitment to report annual energy consumption values in the format required by GLA and in accordance with the Be Seen criteria.

8. Conclusion.

This analysis and calculations outlined within this report confirm that the proposed strategy will result in a highly efficient, low-carbon scheme.

New, high efficiency servicing equipment and efficient fabric will minimise the energy usage of the buildings. Using the Mayor's energy hierarchy, the strategy has been developed to ensure that the Proposed Development is efficient and economical.

This strategy has been prepared to demonstrate that, at the planning stage, the Applicant and design team have given due consideration to the principles of energy and sustainability, and how these can be implemented for the Proposed Development.

The carbon emissions associated with regulated energy use at the Proposed Development have been compared with the GLA London Plan emission targets, local policies and the building regulations.

8.1 The Energy Strategy.

The strategy has been developed using the 'Be Lean, Clean, Green and Seen' energy hierarchy which utilises a fabric first approach to maximise reduction in energy through passive design measures.

Table 12: Plot 01 Energy Strategy.

	Plot 01
Be Lean	A fabric first approach and energy efficient building services will be utilised to reduce carbon emissions and energy demand through best practice passive design measure. The building achieves a reduction in regulated emissions of 8.0% against the Part L baseline at the Be Lean step. This does not achieve the GLA's 15% reduction target; however, the building energy demand has been minimised as far as practically possible at this stage.
Be Clean	No further carbon emission reductions at this step. No current feasible connection to proposed or existing local district heat networks, and a CHP system has been deemed to be unsuitable as it would offer no benefit to the Proposed Development. This being said, the Proposed Development looks to take advantage of a site-wide community heat network. The loop will connect all plots on site, allowing energy to be shared across the building, reducing the primary energy needed to meet the site-wide heating and cooling demand at any given time. The impacts of this are incorporated at the Be Green step. Further, the implementation of a centralised community heat network facilitates connection to any proposed local district heat network, should the opportunity arise in the future.
Be Green	Utilisation of high efficiency air source heat pumps and PVs for the building are anticipated to significantly reduce energy consumption and carbon emissions in operation. The building achieves a reduction in regulated emissions of 24.60% against the Part L baseline at the Be Green step. This does not achieve the GLA's 35% reduction target; however, the building's energy demand and associated CO_2 emissions have been minimised as far as practically possible at this stage.
Be Seen	Monitor, verify and report The Proposed Development will incorporate effective building monitoring systems to allow energy performance review during operation. This data will be used to report on annual emissions of the Proposed Development throughout its lifetime.

8.2 Offsetting.

The 24.60% betterment over the baseline results in a residual 186.87 tCO_2 per year for the Proposed Development. Using the carbon emission value of £95 per tonne of CO_2 for 30 years (or £2,850 per tonne), this results in an offset fund cost of £488,798 for the building.

Table 13: Bishopsgate Goods Yard Offset fund costs.

Bishopsgate Goods Yard	Residual emissions (tCO_2 per year)	Offset fund cost.
Plot 01	186.87	£532,580

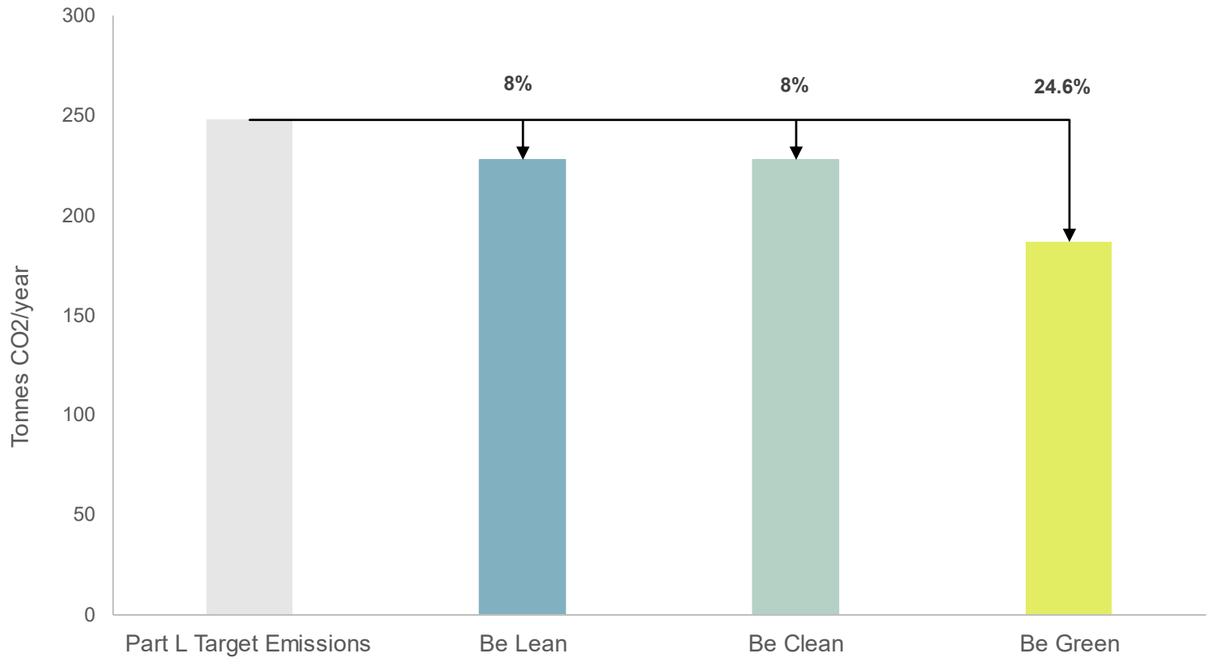


Figure 16: Offset summary for Bishopsgate Goods Yard Plot 01.

Appendix A – Policy context.

The Proposed Development constitutes a 'major Building' (>10 dwellings and/or >1,000m^2 of non-residential floor space) and is therefore subject to the policies of the GLA, contained within the London Plan.

As a summary, regional and local planning policy documents applicable to the Proposed Development have been identified and include the below listed:

- London Plan (March 2021)
- London Borough of Hackney Local Plan 2033 (2016)
- London Borough of Tower Hamlets 2031 (2016)

National policy.

Approved Document Part L
Part L of the Building Regulations is the mechanism by which government is driving reductions in the regulated CO2 emissions from new buildings.

Current Requirements: Part L 2021

Part L 2021 proposes a notable change with the metric "Primary Energy Target" has been introduced as well as the retention of the Fabric Energy Efficiency target for dwellings. The following four performance metrics are now considered:

- Primary energy target
- CO_2 emission target
- Fabric Energy Efficiency Target (Part L1 only)
- Minimum standards for fabric and fixed building services

Local policy.

London Plan (January 2021).

Policy SI 2 – Minimising greenhouse gas emissions

- Major Building should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:
  - Be Lean: use less energy and manage demand during operation
  - Be Clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
  - Be Green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
  - Be Seen: monitor, verify and report on energy performance.
- Major Building proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.
- A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major Building. Residential Building should achieve 10 per cent, and non-residential Building should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:
  - through a cash in lieu contribution to the borough's carbon offset fund, or
  - off-site provided that an alternative proposal is identified, and delivery is certain.
- Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.
- Major Building proposals should calculate and minimise carbon emissions from any other part of the Building, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.
- Building proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life Cycle Carbon Assessment and demonstrate actions taken to reduce life cycle carbon emissions.

Policy SI 3 – Energy infrastructure

- Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale Building proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new Building.
- Energy masterplans should be developed for large-scale Building locations (such as those outlined in Part A and other opportunities) which establish the most effective energy supply options. Energy masterplans should identify:
  - major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
  - heat loads from existing buildings that can be connected to future phases of a heat network
  - major heat supply plant including opportunities to utilise heat from energy from waste plants
  - secondary heat sources, including both environmental and waste heat
  - opportunities for low and ambient temperature heat networks
  - possible land for energy centres and/or energy storage
  - possible heating and cooling network routes
  - opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
  - infrastructure and land requirements for electricity and gas supplies
  - implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector

  - opportunities to maximise renewable electricity generation and incorporate demand-side response measures.
- Building Plans should:
  - identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure
  - identify existing heating and cooling networks, identify proposed locations for future heating and cooling networks and identify opportunities for expanding and inter-connecting existing networks as well as establishing new networks.
- Major Building proposals within Heat Network Priority Areas should have a communal low-temperature heating system:
  - the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:
    - connect to local existing or planned heat networks
    - use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
    - use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the Building's electricity demand and provide demand response to the local electricity network)
    - use ultra-low NOx gas boilers
  - CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality
  - where a heat network is planned but not yet in existence the Building should be designed to allow for the cost-effective connection at a later date.
  - Heat networks should achieve good practice design and specification standards for primary, secondary and tertiary systems comparable to those set out in the CIBSE/ADE Code of Practice CP1 or equivalent.

Policy SI 4 – Managing Heat Risk
- Building proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.
- Major Building proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:
  - reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
  - minimise internal heat generation through energy efficient design
  - manage the heat within the building through exposed internal thermal mass and high ceilings
  - provide passive ventilation
  - provide mechanical ventilation
  - provide active cooling systems.

Local drivers – Hackney Local Plan 2033 (2020)
The project will meet and exceed the key targets set out in Hackney Local Plan (Adopted July 2020), including but not limited to:

- Policy LP 46 – Protection and Enhancement of Green Infrastructure
- Policy LP 48 – New Open Space
- Policy LP 53 – Water and Flooding
- Policy LP 54 – Overheating and Adapting to Climate Change
- Policy LP 55 – Mitigating Climate Change
- Policy LP 56 – Decentralised Energy Networks (DEN)
- Policy LP 57 - Waste
- Policy LP 58 – Improving the Environment – Pollution

Local drivers – Tower Hamlets Local Plan 2031 (2020)
The project will meet and exceed the key targets set out in Tower Hamlets Local Plan 2031, including but not limited to:

- D.ES7: A zero carbon borough
- S.TR1: Sustainable travel
- D.SG3: Health impact assessments
- D.ES2: Air quality
- D.ES9: Noise and vibration
- D.ES10: Overheating
- S.ES1: Protecting and enhancing environment
- D.ES3 Urban greening and biodiversity
- D.ES4: Flood risk
- D.ES5: Sustainable drainage
- D.ES6: Sustainable water and wastewater management
- D.DH2: Attractive streets, spaces and public realm
- D.OWS3: Open space and green grid networks

Appendix B: Software Details.

Compliance software and procedure.

The Proposed Bishopsgate Goods Yard Building has been assessed using the National Calculation Methodology to demonstrate compliance with Approved Document Part L.

Part L2 compliance

Simulation models were created to assess the design of the Bishopsgate Goods Yard Building.

Part L2 Non-Residential

Integrated Environmental Solutions Virtual Environment (IESve) is an approved Dynamic Simulations Modelling (DSM) software package which has the capabilities of enabling the user to create a virtual representation of a building. The results presented in this report for the Non-residential aspects were calculated using the approved compliance software IESve 2022 (v2022.2.0.0).

The IESve models were drawn using information provided by the relevant Plot architects.

IESve modelling disclaimer

The calculations produced by Hoare Lea have been carried out with the information provided by the architects to determine whether the Proposed Development can achieve compliance with Approved Document Part L2 of the Building Regulations.

It should be noted that the data generated by this work is obtained using approved calculations and 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 building 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 building and the actual building. 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.

Appendix C: Input Parameters.

Be Lean: Heating, Cooling and Ventilation systems

The table below details the systems associated with each space type:

Table 14: Be Lean Non-Domestic Input Parameters.

	Detail	Units	System 01 – Rad + NV	System 02 Rads +MVHR	System 03 – FCU + MVHR
	System Name/Description	-	Radiators and Natural Vent	Radiators and MVHR	FCU + Balanced MVHR
	UK NCM System Type	-	Central heating using water: radiators	Central heating using water: radiators	Split or Multi-Split
Heating	Heat Source	-	Heat Pump	Heat Pump	Heat Pump
Heating	Fuel Type	-	Electricity	Electricity	Electricity
Heating	Was the System Installed After 1998	Y/N	Y	Y	Y
Heating	Carbon Conversion Factor	-	0.23kgCO_2/kWh	0.23kgCO_2/kWh	0.23kgCO_2/kWh
Heating	Primary Energy Factor	-	1.05kWh/kWh	1.05kWh/kWh	1.05kWh/kWh
Cooling	Pack Chiller Type	-	-	-	Air Source Heat Pump
Cooling	Pack Chiller Power	kW	-	-	-
Cooling	Chiller Fuel Type	-	-	-	Electricity
Cooling	Generator Seasonal EER (SEER)	%	-	-	5.00 (5.00)
Cooling	Does it Qualify for ECAs	Y/N	-	-	Y
Adjustment & Metering	Ductwork Air Leakage CEN Classification	-	-	Class B	Class A
Adjustment & Metering	AHU Air Leakage CEN Classification	-	-	Class L2	Class L3
Adjustment & Metering	System Specific Fan Power (SFP)	W/l/s	-	1.80	1.80
Adjustment & Metering	Pump Type		-	-	-
Adjustment & Metering	Does the System have Provision for Metering	Y/N	-	Y	Y
Adjustment & Metering	Does the Metering Warn "Out of Range" Values?	Y/N	-	Y	Y
Ventilation	Cooling / Ventilation Mechanism	-	Natural Ventilation	Air Conditioning	Air Conditioning
Ventilation	Air Supply Mechanism	-	-	Balanced supply and extract	Balanced supply and extract
Ventilation	Heat Recovery Type	-	-	Plate heat exchanger	Plate heat exchanger
Ventilation	Heat Recovery Seasonal Efficiency	%	-	85	85
Ventilation	Demand Control Ventilation	-	-	Yes	-
Ventilation	Mechanical Exhaust Extract Flow Rate	Ac/hr	-	-	-
Ventilation	Exhaust/Terminal Unit Specific Fan Power	W(l/s)	-	-	0.17 W/l/s
		Room type applied	Room type applied	Room type applied	Room type applied*
			Circulation and Stairs	WC, Changing	Office

Be Lean: Lighting Parameters

The table below shows the target installed power densities and lighting controls for each space.

The values are specified as an average for these space types.

Specific Lighting System/Area		Main Lighting Gains		Display Lighting		Main Lighting Controls									
								Photoelectric Options					Occupancy Options		
	Lamp Efficacy (lm/W)	Lighting efficiency (W/m^2/100 lux)	Light Output Ratio	Lamp Efficacy (lm/W)	Time Switch?	Local Manual Switch?	Constant Illuminance Control?	Photo-electric Options?	Control type	Sensor Type	Time-switch?	Parasitic Power (W/m^2)	Sensing Type*	Parasitic Power (W/m^2)	Time-Switch?
Circulation Areas	110	-	1.00	-	N	N	N	N	-	-	-	-	AUTO-ON-OFF	0.03	N
Office	-	1.25	1.00	-	N	N	N	N	Dimming	Standalone	Dimming	Standalone	AUTO-ON-DIMMED	0.03	N
WC / Changing	110	-	1.00	-	N	N	N	N	-	-	-	-	AUTO-ON-OFF	0.03	N

Table 15: Be Lean Lighting Installed Power Densities and Controls per Space Type.

* Lighting Controls are defined as follows:

Auto On – Auto Off: Specifies presence detection sensors within the space which automatically switches lighting on when occupants are detected and switches lighting off when the space is detected to be unoccupied.

Man On – Auto Off: Specifies absence detection sensors within the space. Lighting is required to be manually switched on. Automatically switches lighting off when the space is detected to be unoccupied.

Lighting is required to be manually switched on. Automatically switches lighting off when the space is detected to be unoccupied.

Sensor settings	
Vertical Placement	Ceiling (facing down)
Horizontal Placement	Middle of space
Perimeter Dimming Profile	Dimmed to 15% at 300 lux
Core Dimming Profile	Dimmed to 40% at 300 lux

Be Lean: Hot Water system

Domestic Hot Water system		
Generator Seasonal Efficiency	Dedicated ASHP (notional baseline) to changing facilities. 264%	Electric direct hot water to all other spaces. 100%
Storage Storage losses	1000l 0.00470 kWh/(l.day)	-
Secondary circulation Loop length Circulation losses (W/m) Pump power (kW)	 150m 8.00 0.15	

Table 16: Be Lean DHW Details.

Be Green: Heating, Cooling and Ventilation systems

The table below details the systems to be associated with each space type.

	Detail	Units	System 01 – Rad + NV	System 02 Rads +MVHR	System 03 – FCU + MVHR
	System Name/Description	-	Radiators and Natural Vent	Radiators and MVHR	FCU + Balanced MVHR
	UK NCM System Type	-	Central heating using water: radiators	Central heating using water: radiators	Split or Multi-Split
Heating	Heat Source	-	Heat Pump	Heat Pump	Heat Pump
Heating	Fuel Type	-	Electricity	Electricity	Electricity
Heating	Was the System Installed After 1998	Y/N	Y	Y	Y
Heating	Carbon Conversion Factor	-	0.094kgCO_2/kWh	0.094kgCO_2/kWh	0.094kgCO_2/kWh
Heating	Primary Energy Factor	-	1.042kWh/kWh	1.042kWh/kWh	1.042kWh/kWh
Cooling	Pack Chiller Type	-	-	-	Air Source Heat Pump
Cooling	Pack Chiller Power	kW	-	-	-
Cooling	Chiller Fuel Type	-	-	-	Electricity
Cooling	Generator Seasonal EER (SEER)	%	-	-	5.00 (5.00)
Cooling	Does it Qualify for ECAs	Y/N	-	-	Y
Adjustment & Metering	Ductwork Air Leakage CEN Classification	-	-	Class B	Class A
Adjustment & Metering	AHU Air Leakage CEN Classification	-	-	Class L2	Class L3
Adjustment & Metering	System Specific Fan Power (SFP)	W/l/s	-	1.60	1.60
Adjustment & Metering	Pump Type		-	-	-
Adjustment & Metering	Does the System have Provision for Metering	Y/N	-	Y	Y
Adjustment & Metering	Does the Metering Warn "Out of Range" Values?	Y/N	-	Y	Y
Ventilation	Cooling / Ventilation Mechanism	-	Natural Ventilation	Air Conditioning	Air Conditioning
Ventilation	Air Supply Mechanism	-	-	Balanced supply and extract	Balanced supply and extract
Ventilation	Heat Recovery Type	-	-	Plate heat exchanger	Plate heat exchanger
Ventilation	Heat Recovery Seasonal Efficiency	%	-	85	85
Ventilation	Demand Control Ventilation	-	-	Yes	-
Ventilation	Mechanical Exhaust Extract Flow Rate	Ac/hr	-	-	-
Ventilation	Exhaust/Terminal Unit Specific Fan Power	W(l/s)	-	-	0.17 W/l/s
		Room type applied	Room type applied	Room type applied	Room type applied*
			Circulation and Stairs	WC, Changing	Office

Table 17: Green Non-Domestic Input Parameters.

Be Green: Lighting Parameters

The table below shows the target installed power densities and lighting controls for each space.

The values are specified as an average for these space types.

Specific Lighting System/Area		Main Lighting Gains		Display Lighting		Main Lighting Controls									
								Photoelectric Options					Occupancy Options		
	Lamp Efficacy (lm/W)	Lighting efficiency (W/m^2/100 lux)	Light Output Ratio	Lamp Efficacy (lm/W)	Time Switch?	Local Manual Switch?	Constant Illuminance Control?	Photo-electric Options?	Control type	Sensor Type	Time-switch?	Parasitic Power (W/m^2)	Sensing Type*	Parasitic Power (W/m^2)	Time-Switch?
Circulation Areas	110	-	1.00	-	N	N	N	N	-	-	-	-	AUTO-ON-OFF	0.03	N
Office	-	1.25	1.00	-	N	N	N	N	Dimming	Standalone	Dimming	Standalone	AUTO-ON-DIMMED	0.03	N
WC / Changing	110	-	1.00	-	N	N	N	N	-	-	-	-	AUTO-ON-OFF	0.03	N

Table 18: Be Green Lighting Installed Power Densities and Controls per Space Type.

* Lighting Controls are defined as follows:

Auto On – Auto Off: Specifies presence detection sensors within the space which automatically switches lighting on when occupants are detected and switches lighting off when the space is detected to be unoccupied.

Man On – Auto Off: Specifies absence detection sensors within the space. Lighting is required to be manually switched on. Automatically switches lighting off when the space is detected to be unoccupied.

Lighting is required to be manually switched on. Automatically switches lighting off when the space is detected to be unoccupied.

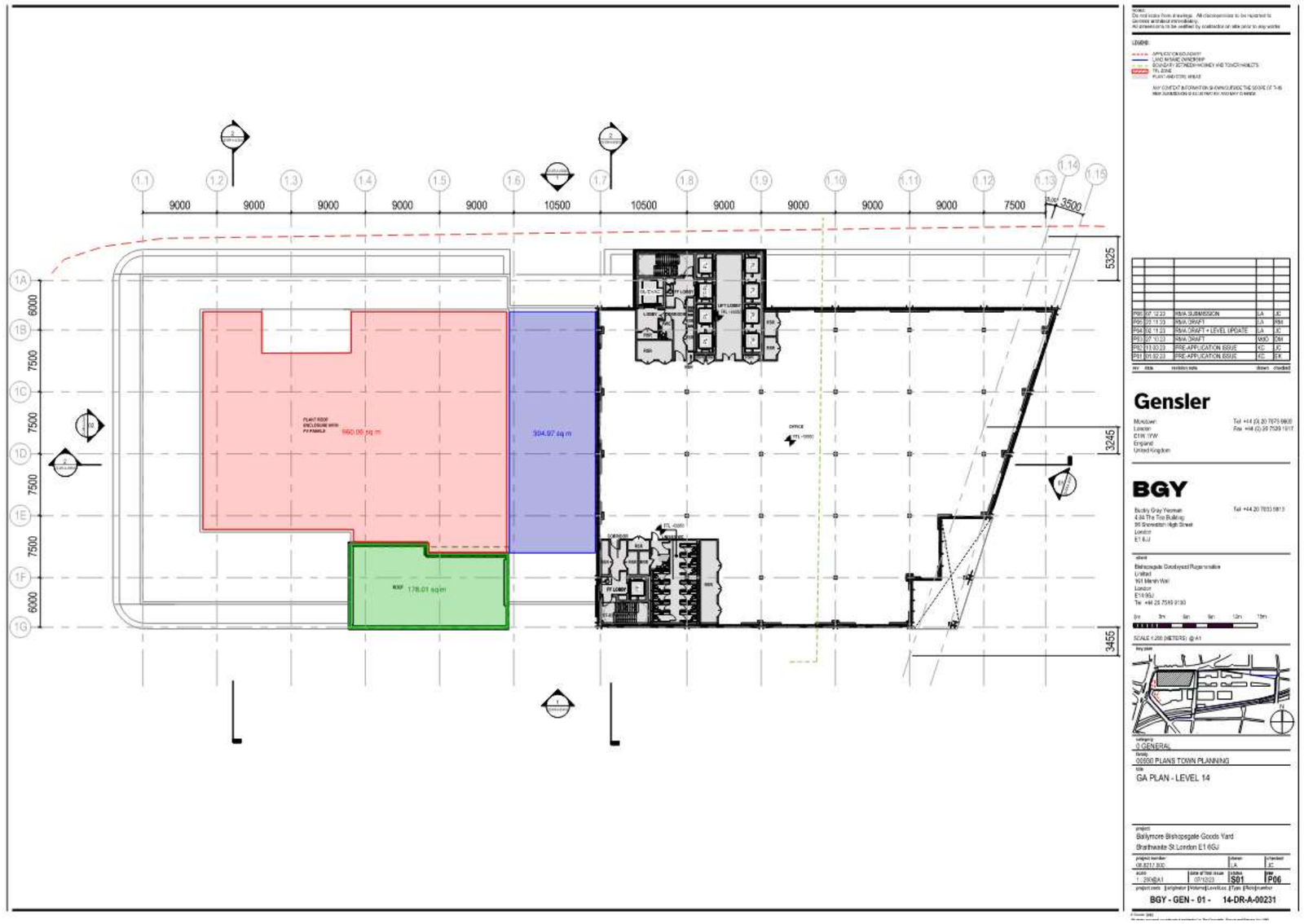
Sensor settings	
Vertical Placement	Ceiling (facing down)
Horizontal Placement	Middle of space
Perimeter Dimming Profile	Dimmed to 15% at 300 lux
Core Dimming Profile	Dimmed to 40% at 300 lux

Be Green: Domestic Hot Water system.

Domestic Hot Water system		
Generator Seasonal Efficiency	Same as space heating to changing facilities only. 94%	Direct Electric hot water to all other spaces. 100%
Storage Storage losses	1000l 0.00470 kWh/(l.day)	-
Secondary circulation Loop length Circulation losses (W/m) Pump power (kW)	 150m 8.00 0.15	

Table 19: Be Green DHW Details.

Appendix D: PV Plan Potential Locations



Appendix E: Correspondence with Local Authority regarding proposed District Heat Network

23/24734 Bishopsgate Goods Yard - Shoreditch South Proposed District Heat Network query

MacGillivray, Callum
To janet.laban@cityoflondon.gov.uk; james.rooke@cityoflondon.gov.uk; mark.donaldson@cityoflondon.gov.uk
Cc Hickinbottom, Sam; Bone, Thom; Palmer, Rowan

Response COL - City2 DEN.pdf
184 KB

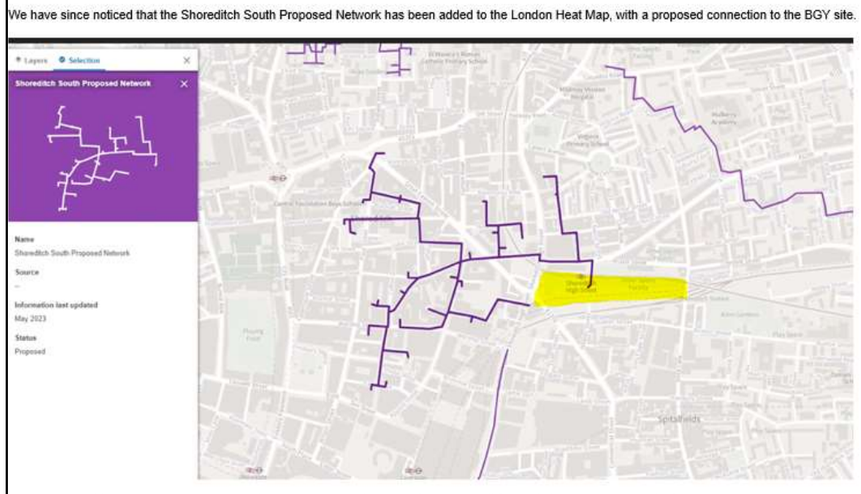
Dear James, Mark, and Janet

I hope you're well?

I am following up on a query by my colleague Tom Spurrier (14/02/2020 email attached) regarding the proposed energy strategy for the development at Bishopsgate Goods Yard (BGY).

In that exchange, it was confirmed that no progress had been made on the proposed City 2 heat network since the initial feasibility study.

We have since noticed that the Shoreditch South Proposed Network has been added to the London Heat Map, with a proposed connection to the BGY site.



Would you be able to provide an update on this proposed network and confirm whether BGY could indeed connect to this?

It would also be helpful to know when this network becomes live and available, as well as the temperature the network will operate at.

I appreciate your help on this.

Kind regards,
Callum MacGillivray
Graduate Sustainability Consultant

Email callummacgillivray@hoarelea.com

HOARE LEA

23/24734 Bishopsgate Goods Yard - Heat Network query

AC

Aaron Caffrey <acaffrey@ballymoregroup.com>
To MacGillivray, Callum; Luke Dalton; Nicola Zech-Behrens
Cc Bone, Thom; Brown, Richard3; Hickinbottom, Sam; Palmer, Rowan; Smith, Tom

Callum,

I am not aware of discussions about connection to this development from this newly proposed DHN, although Nicola is best placed to advise as she has the long history on this project.

We are open to discussions on any future DHN connections, although these are often very complex and difficult to achieve in practice it's something we regularly do so no objection from here.

Kind Regards

Aaron Caffrey
Technical Director

+44 (0)77 6676 2347

ballymore.

Ballymore Group
161 Marsh Wall
London E14 9SJ

+44 (0)20 7510 9100
www.ballymoregroup.com

HOARE LEA

RE: 23/24734 Bishopsgate Goods Yard - Shoreditch South Proposed District Heat Network query

Reply | Reply All | Forward

Donaldson, Mark <Mark.Donaldson@cityoflondon.gov.uk>
To MacGillivray, Callum
Cc Hickinbottom, Sam; Bone, Thom; Palmer, Rowan; Kane, Kerstin; Archer, Lyall; Kirkbright, Arran; Jeremy Martin

Mon 04/09/2023 17:49

Response COL - City2 DEN.pdf
181 KB

Hi Callum,

Thank you for your email. Please note, Janet and James Rooke are no longer at City Corporation.
I've CC'd: Lyall and Arran who work with City Corporation on our heat network developments, Kerstin Kane who is City Corporation sustainability officer in planning, and Jeremy Martin from Hackney's energy team.

Can you confirm the planning application reference number please.

I believe it is: Hackney | Council Direct | Application | 46874
Energy strategy: https://developmentandhousing.hackney.gov.uk/planning/?fa=downloadDocument&id=102208&public_record_id=46874
The strategy states "It is proposed that ASHP technology will be utilised on a plot-by-plot basis to provide space heating and a proportion of domestic hot water" "Future-proofing measures will be implemented to enable connection to any future low carbon district heating network" "Future-proofing for an energy sharing network, linking ASHP across the site, has been enabled within the Proposed Amendments. This would facilitate the interconnection of plots to simultaneously share heating and cooling loads generated across the site".
I note the Energy Strategy MWh Demands: Heating = 779, Hot Water = 663, Cooling = 480
Can you confirm this is still the proposed strategy?

Since your last communication with us (attached) in 2020 there has been some recent development. As you have highlighted below, the Shoreditch South area has been included for a proposed heat network, which is within LB Hackney and Jeremy is leading on its further development – of which a more detailed study is likely to commence shortly.
The City Corporation, in collaboration with Hackney, are shortly to develop a feasibility study, building on the previous City 2 proposal, in partnership with E.On and the GLA.
This study will focus on the North East of the Square Mile, but also encompass the boundary area of Hackney, close to the BGY development area and aligning with their South Shoreditch study. Our study will be engaging with local data centres and other waste heat sources, modelling heat sharing between the City and Hackney, and establishing the network infrastructure (pipe routes and energy centres).

I think it would be best to engage directly with Jeremy to participate in the South Shoreditch study.

Thanks,

Mark

Mark Donaldson MSc BEng,
Senior Energy Engineer, Corporate Energy Team
City of London Corporation | City Surveyor's department
North Wing, Guildhall, Aldermanbury, London, EC2V 7HH
Tel: 0780 8844409
mark.donaldson@cityoflondon.gov.uk | www.CityofLondon.gov.uk

Appendix F: Be Lean and Be Green BRUKLs

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

BGY Plot 01 — As designed

Date: Wed Jan 24 16:58:45 2024

Administrative information

Building Details

Address: Address 1, London, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.19

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.19

BRUKL compliance module version: v6.1.e.0

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 2421.92

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2$annum	5	
Building CO_2 emission rate (BER), $kgCO_2/m^2$annum	4.6	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	44.95	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	43.37	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{k\text{-Limit}}$	$U_{k\text{-Calc}}$	$U_{i\text{-Calc}}$	First surface with maximum value
Walls*	0.26	0.18	0.19	PL00000B:Surf[0]
Floors	0.18	0.13	0.18	L0000005:Surf[4]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	PL000071:Surf[5]
Windows** and roof windows	1.6	1.18	1.21	PL000208:Surf[3]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors#	1.6	1.6	1.6	PL000175:Surf[1]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

$U_{k\text{-Limit}}$ = Limiting area-weighted average U-values [W/(m²K)] — $U_{i\text{-Calc}}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{k\text{-Calc}}$ = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	3

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	49568.8	49568.8
External area [m²]	34393.8	34393.8
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	10848.7	13552.7
Average U-value [W/m²K]	0.32	0.39
Alpha value* [%]	7.92	10

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
100	**Offices and Workshop Businesses**
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	3.14	4.8
Cooling	6	5.12
Auxiliary	5.96	7.19
Lighting	11.84	13.01
Hot water	4.11	4.06
Equipment*	44.71	44.71
TOTAL**	**31.05**	**34.18**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	1.61
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*1.61*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	104.86	101.03
Primary energy [kWh_{PE}/m^2]	43.37	44.95
Total emissions [kg/m²]	4.6	5

Figure 17 Be Lean BRUKL

HOARE LEA

Figure 18 Be Green BRUKL

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

BGY Plot 01 — As designed

Date: Tue Jan 23 10:42:58 2024

Administrative information

Building Details

Address: Address 1, London, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.19

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.19

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 2421.92

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	5	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	3.77	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	44.95	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	41.68	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{k\text{-}Limit}$	$U_{k\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.18	0.19	PL00000B:Surf[0]
Floors	0.18	0.13	0.18	L0000005:Surf[4]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	PL000071:Surf[5]
Windows** and roof windows	1.6	1.18	1.21	PL000208:Surf[3]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.6	1.6	PL000175:Surf[1]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

$U_{k\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] — $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{k\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	3

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	49568.8	49568.8
External area [m²]	34393.8	34393.8
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	10848.7	13552.7
Average U-value [W/m²K]	0.32	0.39
Alpha value* [%]	7.92	10

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
100	**Offices and Workshop Businesses**
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	3.14	4.8
Cooling	6	5.12
Auxiliary	5.96	7.19
Lighting	11.84	13.01
Hot water	4.11	4.06
Equipment*	44.71	44.71
TOTAL**	**31.05**	**34.18**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	1.13	1.61
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*1.13*	*1.61*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	104.86	101.03
Primary energy [kWh_{PE}/m^2]	41.68	44.95
Total emissions [kg/m²]	3.77	5

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