

Augusta Street Warehouse and Distribution Centre Net Zero Carbon Statement

AUGUSTA ST, HUNTINGWOOD NSW 2148

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Table of Contents

AUGUSTA ST, HUNTINGWOOD NSW 2760	0
<u>1 INTRODUCTION</u>	<u>1</u>
1.1 PURPOSE	1
1.2 PROJECT OVERVIEW	1
1.3 SCOPE	2
1.4 LIMITATIONS	2
<u>2 PROJECT DESCRIPTION</u>	<u>3</u>
2.1 ON AND OFF-SITE RENEWABLE ENERGY SOURCES	3
2.2 EMISSION REDUCTION MEASURES	3
2.3 ENERGY CONSUMPTION	4
<u>3 NET ZERO CARBON STATEMENT</u>	<u>5</u>
3.1 NET ZERO CARBON OVERVIEW	5
3.2 ENERGY EFFICIENT DESIGN	5
3.3 HIGH PERFORMANCE BUILDING SYSTEMS	5
3.4 RENEWABLE ENERGY SOURCES	6
3.5 ESTIMATES ENERGY CONSUMPTION	6
3.5.1 ENERGY SOURCES	6
<u>4 GREENHOUSE GAS EMISSIONS</u>	<u>7</u>
4.1 ESTIMATED GHG EMISSIONS	7
4.1.1 SCOPE 1 EMISSIONS	7
4.1.2 SCOPE 2 EMISSIONS	8
4.1.3 SCOPE 3 EMISSIONS	8
<u>5 CONCLUSION</u>	<u>10</u>



Abbreviations

TERM	DEFINITION
Greenhouse Gas Emissions	The release of gases, such as carbon dioxide (CO ₂), methane (CH ₄), and nitrous oxide (N ₂ O), into the atmosphere that have the potential to enhance the greenhouse effect and contribute to global warming and climate change.
Carbon Neutrality	Achieving a state in which the net emissions of carbon dioxide (CO ₂) and other greenhouse gases (GHGs) released into the atmosphere are equal to the amount removed from the atmosphere, resulting in a net-zero carbon footprint.
Emission scopes	A mechanism for classifying different sources of GHG emissions used in carbon accounting. There are three 'scopes'
Scope 1 GHG Emissions	Greenhouse gas emissions that result from sources owned or directly controlled by an organisation or entity. These emissions typically include those from on-site combustion of fossil fuels, such as natural gas and diesel.
Scope 2 GHG Emissions	Greenhouse gas emissions associated with the consumption of purchased electricity, steam, or heating/cooling, but not directly owned or controlled by the organisation. These emissions result from the generation of energy used by the organisation.
Scope 3 GHG Emissions	Greenhouse gas emissions that occur as a result of an organisation's activities but are not directly owned or controlled by the organisation. These emissions encompass a wide range of indirect sources, such as supply chain, transportation, and employee commuting.
Carbon Offset	A compensatory measure in which an organisation or individual invests in activities or projects that reduce or remove an equivalent amount of greenhouse gas emissions from the atmosphere to offset their own emissions, helping achieve carbon neutrality.



Executive Summary

LOGOS is dedicated to delivering a development that can operate Net Zero Carbon and minimise the Greenhouse Gas Emissions (GHG-e) of the development. This report summarises the expected GHG-e of the development at Augusta St, Huntingwood NSW 2148, and highlights the design steps taken to reduce the carbon in the development.

LOGOS's dedication to reducing GHG-e is a pivotal element of their organisational strategy. This commitment significantly shapes the strategies delineated for attaining carbon neutrality in their developments. The following report offers a comprehensive overview of the strategies employed to achieve this goal in the development of the Augusta Street Warehouse and Distribution Centre.

Table 1 presents an analysis of the estimated operational Scope 1 and 2 GHG emissions associated with Augusta Street Warehouse and Distribution Centre. These calculations are based on emissions originating from the current electricity grid and assumptions. It is proposed as the design develops a more detailed assessment of the greenhouse gas emissions would be undertaken. Additionally, projections have been made for the year 2050, assuming that the electricity grid will have achieved carbon neutrality by then.

Table 1 - Summary of estimated GHG Emissions

	AUGUSTA STREET WAREHOUSE AND DISTRIBUTION CENTRE 2030 – GHG EMISSIONS	AUGUSTA STREET WAREHOUSE AND DISTRIBUTION CENTRE 2050 – GHG EMISSIONS
GHG Emissions (t CO ₂ -e)	4,472,238	240,000

To advance towards a zero-carbon future, an action plan has been developed for the building, aiming to achieve climate positivity by relying entirely on renewable energy while offsetting the remaining scope 1 and 2 emissions.



1 INTRODUCTION

1.1 PURPOSE

This Net Zero Carbon Statement outlines the actions to achieve Net Zero GHG-e for the Augusta Street Warehouse and Distribution Centre development and demonstrates how the development has considered the ability to go carbon neutral in the future. This report is intended to satisfy the Sustainable Building SEPP as a net zero action plan.

The following plan aims to achieve the below objectives:

- Detail how the development will be fossil fuel-free during operational use;
- Describe energy reduction initiatives;
- Describe renewable energy generation infrastructure as part of the development;
- Estimate energy consumption of the development; and
- Estimate GHG emissions for energy use of the development.

1.2 PROJECT OVERVIEW

The site is located at Augusta St, Huntingwood, within the Blacktown local government area (LGA). The development includes the construction and operation of a warehouse and distribution centre development of approximately 133,026 m² gross floor area, including four warehouse buildings, ancillary office space, office facilities, indicative warehouse fit-out works inclusive of warehouse racking, on-site car parking, and associated works including excavation, landscaping, and signage.

The site comprises of multiple parcels of land and is legally described as:

- | | | |
|--|------------------------|----------------------|
| ▪ Lot 1 DP835264 | ▪ Lot 1 DP119616 | ▪ Lots 6-10 DP801210 |
| ▪ Lots 218-219 DP457024 | ▪ Lots 4-6 DP226294 | ▪ Lot 4 DP585492 |
| ▪ Lot 2151 DP135859 | ▪ Lots 50-52 DP1144623 | ▪ Lot 4 DP583442 |
| ▪ Lot 2 DP516449 | ▪ Lot 7 DP803359 | ▪ Lot 2 DP1263824. |
| ▪ Lot 163-164, 168-188
and 216 DP8716 | | |

Figure 1 below shows the location of the site in context.



Figure 1. Augusta St, Huntingwood: site overview. (Source: Urbis 2022)

Figure 2 shows the proposed site operations and development.

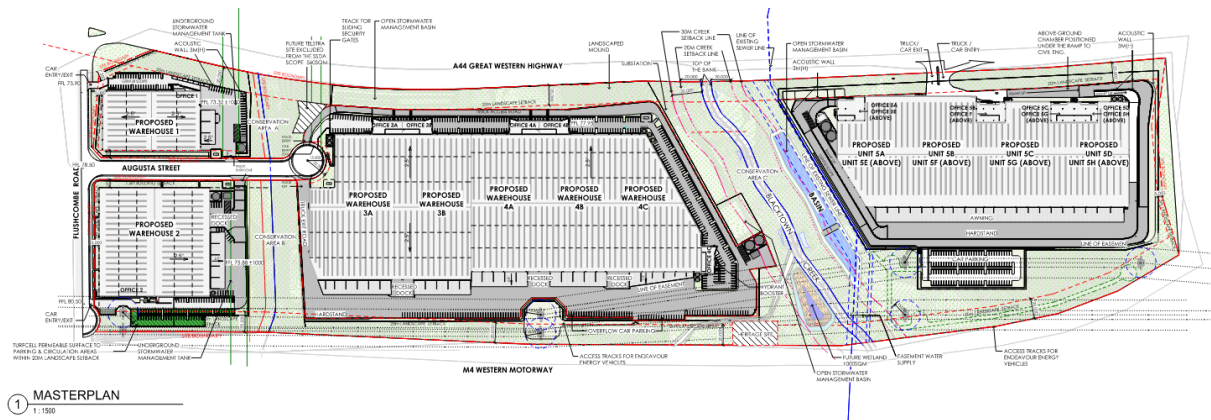


Figure 2. Proposed development site plan (Source: Pace Architects).

1.3 SCOPE

This Net Zero Carbon Statement has been created to align with the Sustainable Buildings SEPP requirements, which focuses on Scope 1, 2 and 3 emissions. The action plan must demonstrate that 100% of the building’s energy can be sourced from renewables and all other operational GHG-e from the building can be offset in the future, to allow carbon neutral operations.

1.4 Limitations

The values used in this net zero statement are from a desktop assessment and an estimates based on currently available data and plans, and may be subject to change over time. As new data and estimates become available and finalised, this statement will be updated with more accurate representation of the greenhouse gas emissions.

2 PROJECT DESCRIPTION

LOGOS is constructing an industrial development with a strong commitment to sustainability throughout design, construction, and operation. The development has been designed and constructed to achieve a high level of sustainability and performance. To reach this objective, LOGOS will comply with the NSW Sustainable Buildings SEPP requirement of operating at net zero GHG-e.

To assess the project's scope, the following elements are being assessed:

- On and off-site renewable energy sources;
- Measures for reducing emissions;
- Energy consumption; and
- GHG emissions.

2.1 ON AND OFF-SITE RENEWABLE ENERGY SOURCES

To achieve no on-site fossil fuel consumption during the operational stage of the project, all energy will be sourced from renewable sources. This includes a rooftop photovoltaic system to supply the project with on-site energy generation. Through the use of a Purchase Power Agreement (PPA), or the NSW electricity grid becoming carbon neutral, the development is capable of securing all the energy demand from renewable sources.

2.2 EMISSION REDUCTION MEASURES

To minimise the building's emissions, a variety of emission reduction measures have been incorporated into the design. These measures encompass:

- Significant photovoltaic array;
- High efficiency LED lighting;
- Energy meters and monitoring systems;
- Efficient irrigation systems; and
- Natural ventilation throughout to reduce load.

2.3 ENERGY CONSUMPTION

The only path to a low carbon economy and achieving a “2°C world”, where the average global temperature is kept to less than 2°C above pre-industrial levels, is through comprehensive and complete consideration of how the development consumes resources, including energy, water, and material efficiency.

The energy efficiency strategy generally follows the energy efficiency pyramid of design in Figure 3. In the first instance, demand for greenhouse gases should be reduced. Consideration should be given to how to remove the need for energy to be consumed where possible. Beyond this, energy can be more efficiently used, through more efficient lighting, mechanical systems, and appropriate services.

Once the system has reduced all available energy-consuming elements and made the remaining systems as efficient as possible, renewable energy sources will be considered. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area provided this does not interfere with the reflectivity. Only after all the above steps have been completed should offsets be used to close the gap and achieve neutrality.

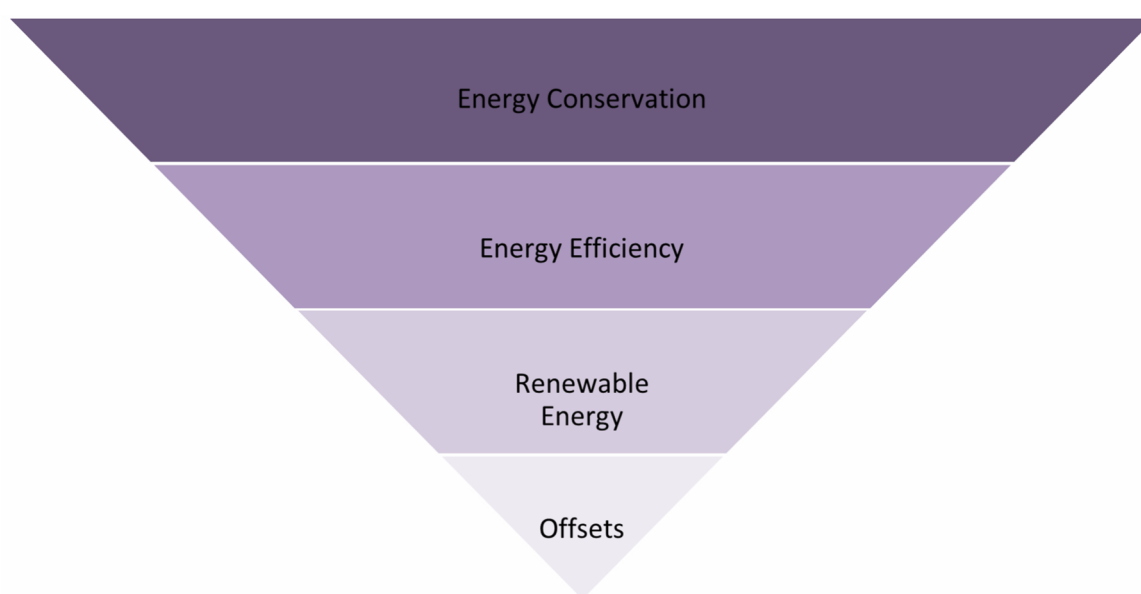


Figure 3. Energy efficiency pyramid: pathway to carbon neutrality

To achieve the above, the following initiatives are proposed:



Renewable Energy – The roof area provides an excellent opportunity for installation of a solar photovoltaic system. The sizeable system will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area. The development will also potentially look into providing onsite battery storage to further reduce reliance on the grid. This will allow the site to store generated energy throughout the day.



Efficient Lighting Systems – High efficiency LED lighting throughout, including in common areas with efficiency controls to meet the requirements of NCC 2022 Section J. Controls will include motion sensors, time clocks and zoned switching.



Controls, Energy Metering and Monitoring – Energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J8 requirements. Preference for natural ventilation and comfort through adaptive cooling and shading.



3 NET ZERO CARBON STATEMENT

3.1 NET ZERO CARBON OVERVIEW

LOGOS is dedicated to developing Augusta Street Warehouse and Distribution Centre as net zero carbon for the entirety of the developments operational use. To reach this goal, LOGOS will employ the following strategies:

- Energy efficient design;
- High performance building systems; and
- Reduction of loads where not required for functionality

3.2 ENERGY EFFICIENT DESIGN

The development will be employing passive design features to create energy-efficient buildings, while reducing dependence on the electrical grid.

Through integration of passive design features into the developments design, we can reduce the reliance on the building's mechanical systems by accessing the natural resources available. The development will be utilising a high-performance façade and shading systems to reduce the load on the HVAC system. This façade will use strategically placed eaves, awnings, and landscaping to reduce this load. Additionally, cross ventilation and high-quality insulation will contribute to the reduction of the heat gain and loss of the buildings.

3.3 HIGH PERFORMANCE BUILDING SYSTEMS

Throughout the development high-performing building systems will be installed to reduce demand to the electrical grid. These systems include:

- High efficiency LED lighting throughout, including in common areas with efficiency controls to meet the requirements of NCC 2022 Section J. Controls will include motion sensors, time clocks and zoned switching;
- Energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J8 requirements. Preference for natural ventilation and comfort through adaptive cooling and shading;
- Water sensitive Urban design principles
- Water recycling through water storage with excess discharged into bio-retention and detention areas

3.4 RENEWABLE ENERGY SOURCES

The roof area provides an excellent opportunity for installation of a solar photovoltaic system. The sizeable system will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. The system will be sized to meet 50% of total predicted energy demand in operation. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area.

In order to ensure that 100% of the site's energy consumption is derived from renewable sources, off-site renewable electricity may be obtained through the energy market.

3.5 ESTIMATES ENERGY CONSUMPTION

The estimated annual total energy consumption of the development is summarised in the table below.

Table 2, Estimated Annual Energy Consumption

	ELECTRICITY (kWh/year)
ESTIMATED FOSSIL FUEL CONSUMPTION	0
ESTIMATED ELECTRICITY CONSUMPTION	4,000,000
TOTAL ESTIMATED ENERGY CONSUMPTION	4,000,000

3.5.1 ENERGY SOURCES

The development will be fossil fuel-free and will source all energy from renewable sources. Additionally, no gas will be included in the development.

Electricity consumption has been validated and estimated using the BASIX Calculation engine. This includes up-to-date and verified estimates of the actual energy consumption predicted to be used for the development.

Diesel has been predicted assuming minimal backup electricity power requirements for testing only.

Refrigerants have been estimated, using an estimated charge per packaged unit, and assuming a 2% loss factor each year. The working refrigerant is R410A.

4 GREENHOUSE GAS EMISSIONS

4.1 ESTIMATED GHG EMISSIONS

The following table summarise the total GHG Emissions for the Augusta Street Warehouse and Distribution Centre development based on the predicted energy consumption.

Table 3 - Total Greenhouse Gas Emissions breakdown for 2023.

SCOPE	EMISSION SOURCE	GHG EMISSION (t CO ₂ -e)	GHG EMISSIONS (%)
1	Gas consumption	0	0.00%
	Diesel	27.09	0.00%
	Refrigerants	18.4	0.00%
2	Electricity Consumption	4,272,000	95.52%
3	All other sources*	200,192.50	4.48%
1,2 & 3	TOTAL	4,472,238	100.00%

*Scope 3 emissions has been estimated at 5% the total of Scope 1 & 2 emissions for this building.

4.1.1 SCOPE 1 EMISSIONS

LOGOS is committed to the electrification of the development and will not include any gas within the project.

The diesel consumption is restricted to the backup generators for emergency situations or power outages. Routine usage of the generator is confined to scheduled testing and maintenance.

Table 4 - Estimated Diesel consumption and GHG Emissions

EMISSION SOURCE	DIESEL CONSUMPTION (~kL)	GHG EMISSION FACTOR (kg CO ₂ -e /GJ)	EMISSIONS (t CO ₂ -e)
DIESEL CONSUMPTION	10	69.9	27.09

The table below provides an overview of the total refrigerants related to the building's services and the associated annual emissions.

Table 5 - Annual Refrigerant GHG Emissions

REFRIGERANT	GWP (kg CO ₂ -e /kg)	TOTAL CHARGE (kg)	EMISSIONS (t CO ₂ -e)
R-410A	15,392	480*	18.4

*Assuming a 2% leakage factor

*Total Charge estimated from total cooling load capacity, VRF system and minimal refrigerant pipe runs.

*GWP for R-410A sourced from the Department of Climate Change, Energy, the Environment and Water, 2022

4.1.2 SCOPE 2 EMISSIONS

The development's annual electrical consumption and the associated carbon emissions are summarised in the table below.

Table 6 - Electricity consumption and GHG Emissions

EMISSION SOURCE	ELECTRICITY CONSUMPTION (kWh)	GHG EMISSION FACTOR (CO ₂ -e / kWh)	EMISSIONS (t CO ₂ -e)
ELECTRICITY CONSUMPTION	4,000,000	1.068	4,272,000

4.1.3 SCOPE 3 EMISSIONS

Scope 3 emissions are all indirect emissions within the supply chain of operating the site that are not fully under the developer's control. This includes *upstream* activities such as energy in goods and services consumed and employee travel as well as *downstream* activities such as waste, investments and actions that occur from the building.

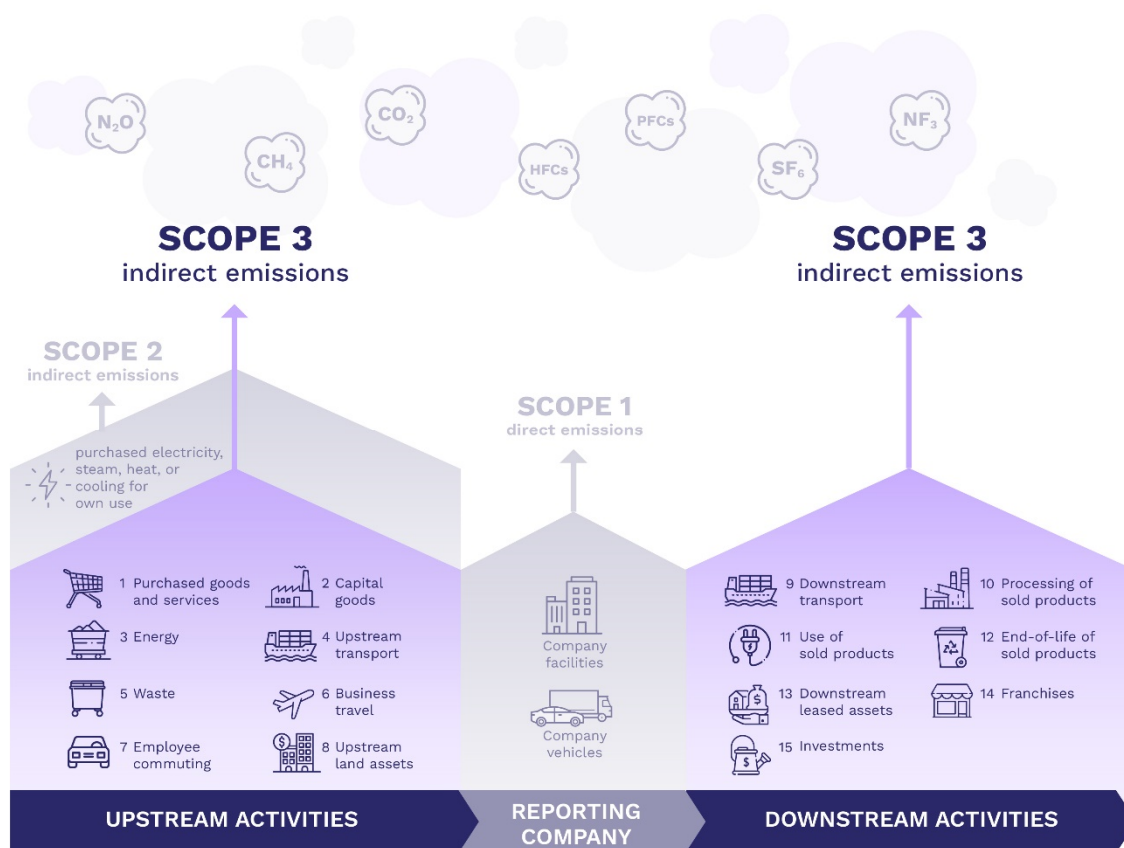


Figure 4. Scope 3 emissions (Source: thinkstep anz)

This area of carbon emissions is the hardest to track as it requires a full assessment of the supply chain. It is typical to not assess the entire process, but only the elements that make up around 95% of the total. The remaining elements that make up the resulting 5% are not a focus as they represent a small part of the total.

Typically, Scope 3 emissions are made up of the following:

UPSTREAM SCOPE 3	DOWNSTREAM SCOPE 3
Category 1: Purchased goods and services	Category 9: Downstream transportation and distribution
Category 2: Capital goods	Category 10: Processing of sold products
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)	Category 11: Use of sold products
Category 4: Upstream transportation and distribution	Category 12: End-of-life treatment of sold products
Category 5: Waste generated in operations	Category 13: Downstream leased assets
Category 6: Business travel	Category 14: Franchises
Category 7: Employee commuting	Category 15: Investments
Category 8: Upstream land assets	

5 CONCLUSION

LOGOS’s dedication to reducing GHG-e is a pivotal element of their organisational strategy. This commitment significantly shapes the strategies delineated for attaining carbon neutrality in their developments. The following report offers a comprehensive overview of the strategies employed to achieve this goal in the development of Augusta Street Warehouse and Distribution Centre.

Table 7 presents an analysis of the existing operational Scope 1 and 2 GHG emissions associated with the Augusta Street Warehouse and Distribution Centre development. These calculations are based on emissions originating from the current electricity grid. Additionally, projections have been made for the year 2050, anticipating that the electricity grid will have achieved carbon neutrality by then.

Table 7. Summary of estimated GHG Emissions

	AUGUSTA STREET WAREHOUSE AND DISTRIBUTION CENTRE 2030 – GHG EMISSIONS	AUGUSTA STREET WAREHOUSE AND DISTRIBUTION CENTRE 2050 – GHG EMISSIONS
GHG emissions (t CO ₂ -e)	4,472,238	240,000

To advance towards a zero-carbon future, an action plan has been developed for the building, aiming to achieve climate positivity by relying entirely on renewable energy while offsetting the remaining scope 1 and 2 emissions.

This report is intended solely to offer an approximate assessment of this development's performance concerning GHG-e, as per the Green Star criteria. To this end, certain assumptions have been made regarding the development's energy consumption, which may not precisely mirror the building's actual consumption. Numerous factors linked to the building's tenancy, such as the loads from process equipment, occupancy rates, and operational schedules, will influence the building's energy consumption and the emissions associated with it. Consequently, any information concerning this development's specific energy usage and GHG-e is unlikely to precisely represent the building's real-world performance.

Instead, this report serves as a guideline for understanding the magnitude of emissions and the necessary steps required for the building to attain a state of zero operational carbon emissions.



