GHG Assessment Report

251309 PROJECT ATLAS

Client:
Goodman Property Services (Aust) Pty Ltd

Revision:
A

Date:
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REPORT INFORMATION

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CONTENTS

Executive Summary

This report presents a Greenhouse Gas (GHG) Emissions assessment prepared in accordance with the NSW Guide for Large Emitters (hereafter "the Guide") to accompany the State Significant Development Application (SSDA) submission for the construction and ongoing operation of a data centre facility and associated Offsite Enabling Infrastructure (OEI) at 10 Roberts Road, Eastern Creek within in the Blacktown Local Government Area ("LGA"). The site is legally described as Lot 553 in Deposited Plan 1110447. The report has been prepared as the proposed development is understood to meet the thresholds for large emitter classification, generally that the Scope 1 & 2 emissions exceed 25,000 tCO_2-e per year, per the Guide.

The GHG assessment utilises an assessment boundary across major project emissions sources covering materials production and construction (Modules A1–A5) and operational energy use (Module B6) in consideration of the delivery stages and associated timing estimates for construction, IT capacity buildout, functional capacity utilisation and operational design life. Beyond major sources there are some minor sources such as waste, water use, and end of life activities, that based on past project experience account for 1-2% of the total emission and are therefore considered negligible and been excluded.

The GHG assessment has been carried out across three comparative scenarios:

- **Scenario 1: Benchmark** – Reference performance benchmark equivalent to the national average data centre performance of an approximate PUE of 1.55.
- **Scenario 2: Design Measures** – Includes the targeted project design features that minimise demand and maximise efficiency in support of the target annual PUE of 1.25.
- **Scenario 3**: **All Measures** – Per Scenario 2 plus all electricity procured is 100% renewable electricity for all non-IT equipment from Day 1 of operation per the proponent's commitment and emissions goals and net-zero emissions (Scope 1 & 2) for all non-IT equipment is supported by 2050 in alignment with the NSW Government's target.

In consideration of the scenarios emissions estimates were made for across Scope 1 and 2 categories for both likely Operational Throughput and Maximum Throughput. Scope 3 emissions have also been estimated for information as required by the Guide.

Table 1 provides a summary of the Scope 1 and 2 emission estimates for the assessed scenarios. The estimated annual Scope 1 & 2 emissions for the project (across Building 1 and Building 2) due to the pursued Design Measures is around 55.7% less emissions for that under the Proponent's control than that of the Benchmark approximate national average performance.

Per the Proponent's commitments and emissions goals, considering All Measures being pursued leads to the Scope 1 & 2 emissions under the Proponent's control being almost entirely eliminated with an estimated 99.0% reduction compared to the Benchmark. Annual average emissions estimated at 390 tCO_2-e/annum for that under the Proponent's control is well below the Guide's threshold of 25,000 t-CO_2-e/annum.

Table 1: Design Life Scope 1 & 2 emissions (tCO_2-e) Estimate Summary Across Assessment Scenarios - Operational Throughput

Item	GHG Emissions (t-CO_2-e/yr)		
Emissions Scope	*Scenario 1 Benchmark*	*Scenario 2 Design Measures*	*Scenario 3 All Measures*
Scope 1	167,191	53,254	21,444
Scope 2	1,985,476	899,591	0
Subtotal 1 + 2	**2,152,668**	**952,844**	**21,444**
Percentage Difference to Benchmark		*-55.7%*	*-99.0%*
Average Annual 1 + 2 (t-CO_2/year)	39,139	17,324	390

The following table summarises the Scope 3 emissions under the Proponent's control as well as Tenant emissions (classified Scope 3 per the GHG Protocol and the Large Emitters Guide) for the project. A 19.6% reduction in emissions is estimated when comparing the project Design Measures of Scenario 2 to the Scenario 1 Benchmark. When considering Scenario 3 All Measures of mitigation, a 34.5% reduction in emissions is estimated when compared to the Scenario 1 Benchmark.

Item	GHG Emissions (t-CO_2-e/yr)		
Emissions Scope	*Scenario 1 Benchmark*	*Scenario 2 Design Measures*	*Scenario 3 All Measures*
Scope 1	167,191	53,254	21,444
Scope 2	1,985,476	899,591	0
Scope 3 – Proponent	399,524	371,856	371,856
Scope 3 – Tenant Scope 2	3,706,794	3,706,794	3,706,794
Total	**6,258,985**	**5,031,495**	**4,100,094**
Percentage Difference to Benchmark		*-19.6%*	*-34.5%*
Average Annual 1 + 2 (t-CO_2/year)	113,800	91,482	74,547

The Proponent is committed to work with prospective Tenant(s) to minimise or eliminate the GHG emissions associated with their electricity use, through the procurement of renewable electricity on the Tenant(s) behalf, as required. Although reductions for these Scope 3 emissions have not been taken, it is common place for data centre tenant's across the industry to procure renewable electricity for their operations. This is particularly the case for hyperscale customers that have public commitment to procure renewable electricity.

Per the requirements of the NGER Act the Proponent will be responsible for providing annual reports on the basis that the annual energy use will exceed the 100TJ (27,778 MWh) per annum threshold for facilities, as can be seen in Table 7.

Note that response to Safeguard Mechanism and Electricity Firming Infrastructure as requested by the NSW Guide for Large Emitters is not required as these are not applicable to the project. The Safeguard Mechanism applies to projects that emit greater than 100,000 t-CO_2-e of Scope 1 emissions in any year which the project does not as can be seen in Table 1. Electricity Firming Infrastructure applies to grid energy storage / backup technology projects that provide electricity supply when renewable generation is not available that the project is not.

1 Introduction

This Greenhouse Gas (GHG) Assessment Report has been prepared by LCI on behalf of Goodman Property Services (Aust) Pty Ltd to accompany a State Significant Development Application (SSDA) for a data centre facility and associated Offsite Enabling Infrastructure (OEI) at 10 Roberts Road, Eastern Creek, Blacktown.

This report has been prepared to address the requirements applicable to the project as defined in the NSW Guide for Large Emitters developed by the Environment Protection Authority (EPA).

The proposed Data Centre is located at 10 Roberts Road, Eastern Creek, legally referred to as Lot 553 DP1110447 with Offsite Enabling Infrastructure (OEI) proposed across Lot 21 DP1246626, Lot 20 DP1157491, and Lot 22 DP1246626 to connect to TransGrid's Sydney West Substation & Switchyard (refer to Figure 1 below). The site is located on Country of the Dharug people within the local government area of Blacktown.

The Data Centre site has a land area of approximately 168,574m^2.

The site is identified as part of the Eastern Creek Precinct Stage 3 within the Western Sydney Employment Area. It is located approximately 35km of the Sydney Central Business District (CBD) and 5.1 km from Rooty Hill Train Station.

The site has a site area of approximately 17 hectares and is bounded by industrial development and has a primary frontage of 400m to Roberts Road. The existing site contains an industrial warehouse and surrounding hard-stand areas.

Surrounding land uses in the vicinity include:

- Northeast: A range of mixed-use industry & commercial buildings
- Southeast: Data Centre and substation
- South, southwest and west: land primarily owned and operated by TransGrid Sydney
- Northwest: Commercial industry and the Industrial Harvest café

The site is zoned IN1 General Industrial within Chapter 2 Western Sydney Employment Area of State environmental Planning Policy (Industry and Employment) 2021 (IESEPP). The proposal is permissible with development consent in the IN1 zone as per the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

A summary of key features for the site and surrounding context are also summarised in the table below.

Item	Description
Site Area	Data Centre – 168,574m^2
Ownership	Goodman
Legal Description	Data Centre - Lot 553 DP1110447 OEI - Lot 21 DP1246626, Lot 20 DP1157491, and Lot 22 DP1246626

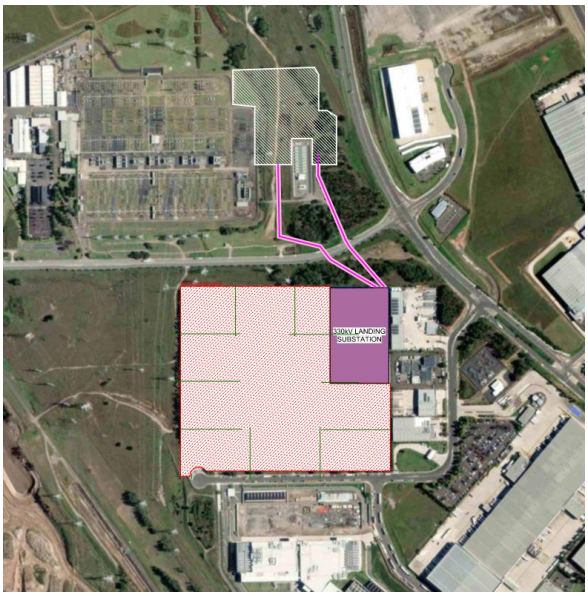

Figure 1: Aerial photograph of site (Source: Urbis GIS, 2025)

The project comprises the construction of a data centre development including the following key components:

- Site preparation works including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing and bulk earthworks.
- Construction, fit-out and 24/7 operation of a Data Centre
- Offsite enabling infrastructure
- 2 Data Centre Buildings
  - Building 1 – 2 Level + rooftop plant
  - Building 2 – 3 Level + rooftop plant
- Ancillary office, EOT and amenity
- Provision of required utilities including:
- diesel storage tanks
- water tanks
- substations on site
- Vehicle access for 20m articulated vehicles (semi-trailers)
- Associated landscaping and site servicing
- Installation of site services and drainage infrastructure

1.1 Project Triggers for Large Emitter Classification

In accordance with Section 2.1 of the NSW Guide for Large Emitters, there are three criteria that if met a project is classified as a large emitter and must prepare a GHG Assessment Report in accordance with the guide. The project meets the three criteria defined in the Guide as follows:

1. The project proposal requires development assessment and approval under the Environmental Planning and Assessment Act 1979;

2. The project involves scheduled activities under Schedule 1 of the POEO Act; and
3. The project is likely to emit more than 25,000 tonnes of scope 1 and 2 emissions carbon dioxide equivalent (CO_2-e) in any financial year during the operational life of the project (based on planned operational throughput and as designed).

1.2 IPCC Sectors and Subsectors of the Project Emissions

The project emissions are considered to have the following sector and subsector categorisation according to the Intergovernmental Panel on Climate Change (IPCC) aligned to the production categories used in the emissions assessment.

Table 2: Alignment to IPCC emissions sectors and subsectors.

Production	Source	Sector	Subsector	Scope
Diesel Oil	Generators	Energy	Buildings	1 & 3
Refrigerants	Chillers	Industrial Processes and Product Use (IPPU)	Ozone Depleting Substances (ODP)	1
Non-IT Electricity	Grid	Energy	Buildings	2 & 3
IT Electricity	Grid	Energy	Buildings	3
Materials & Construction	Extraction, Transport, Manufacture & Construction	Energy	Manufacturing & Construction	3
Water Treatment & Distribution for Use	Grid	Energy	Other	3

1.3 Project Stages and Life

The proposed data centre development comprises two data centre buildings (Building 1 & Building 2) that will generally each be provided individually with associated supporting infrastructure that will be delivered in two major stages. Table 3 describes the estimated timing for the project stages used as the basis of the assessment. Note the timing is preliminary and subject to change.

Table 3: Project staging

Stage	Building	Construction Start	Construction End	Operational Start
1	Building 1	November 2026	November 2028	June 2028
2	Building 2	November 2027	November 2029	June 2029

It is noted the construction of each stage overlap a single construction period. The IT load capacity build out will commence 6 months prior to practical completion for the respective building (i.e. June 2028 for Building 1 and June 2029 for Building 2) with approximately 12MW of IT load to come online every two months until the entire site capacity has been filled.

The data centre buildings are assumed for the assessment to have an overall design life minimum of 50 years.

2 Legislative and Policy Context

The section provides an overview of relevant NSW legislation and policies that relate to GHG emissions assessment, mitigation and reporting.

Climate Change (Net Zero Future) Act 2023

This Act describes the NSW government climate change actions and the future pursuit of net zero emissions by 2050 with the following key elements:

- Guiding principles for addressing climate change, considering impacts, opportunities, and the need for action.
- Emissions reduction targets for NSW:
  - 50% reduction from 2005 levels by 2030.
  - 70% reduction from 2005 levels by 2035.
  - Net zero emissions by 2050.
- Objective to enhance NSW's resilience to a changing climate.
- Establishment of an independent Net Zero Commission to monitor progress and provide expert advice.

Net Zero Plan Stage 1: 2020-2030

This plan describes how the NSW Government will deliver on the objective of net zero emission by 2050 over the 2020-2030 period.

Protection of the Environment Administration Act 1991

This Act provides a framework for environmental protection and administration in NSW and appoints the EPA as the Authority over environmental protection matters.

Protection of the Environment Operations Act 1991

This NSW environmental legislation that regulates activities that may impact the environment with the following objectives in summary:

- Protect, restore, and enhance the quality of the environment while supporting ecologically sustainable development.
- Increase public involvement and participation in environmental protection.
- Ensure the community has access to meaningful information about pollution.
- Reduce risks to human health and prevent environmental degradation through mechanisms that promote pollution prevention and control.
- Establish a clear regulatory framework, including licensing and enforcement, administered by the NSW Environment Protection Authority (EPA).

National Greenhouse and Energy Reporting (NGER)

The NGER scheme is a national framework in Australia that outlines the conditions for which entities are required to report greenhouse gas emissions, energy production, and energy consumption. Key elements include:

- Scope: It covers large corporations, facilities, and activities that meet specific thresholds.
- Reporting: Entities report their emissions data annually, including direct emissions (Scope 1), indirect emissions from purchased electricity (Scope 2), and other relevant data.

- Verification: Independent verification of reported data ensures accuracy and compliance.
- Public Disclosure: Emissions data is publicly accessible through the Clean Energy Regulator's NGER database.

Safeguard Mechanism

The Safeguard Mechanism is an Australian Government (Commonwealth) policy administered by the Clean Energy Regulator and the Department of Climate Change, Energy, the Environment and Water (DCCEEW). The purpose is to limit and reduce emissions from Australia's largest industrial facilities being those that have more than 100,000 t-CO_2-e per year Scope 1 emissions.

3 GHG Emissions Assessment

3.1 Assessment Boundary and Scenarios

3.1.1 Assessment Boundary

The GHG assessment boundary of the project considers the following project stages and elements:

- Construction including:
  - Materials Production – Modules A1 to A3
  - Construction – Modules A4 & A5
- Operation over the design life including:
  - Energy Use – Module B6

The proposal includes site preparation works, including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing and bulk earthworks; however, the associated material emissions are not considered in the GHG assessment for the following reasons below:

- The demolition of previously existing buildings or structures' life cycle and its historic embodied carbon should not be applied to the new building's life cycle. The GHG assessment boundary between the old building and new building shall be drawn at the point after the previous building has been demolished and all rubble has been cleared. The new building is responsible for any earthworks and all construction from this point forward. This aligns with the NABERS Embodied Carbon methodology for existing buildings/structures.
- The site is level and the development works are generally at/above grade therefore bulk earth/ excavation works will be minimal.

There are several minor sources that based on previous project experience are generally considered a negligible portion of the development's total lifetime emissions in the order of 1-2%. These minor emissions sources have therefore not been included:

- Scope 3: Indirect waste emissions
- Scope 3: Indirect emissions from water use
- Scope 3: End-of-life decommissioning, closure, post-closure and maintenance/repair/replacement activities

3.1.2 Assessment Scenarios

For the GHG assessment of the project, the following scenarios have been considered for the emissions estimates:

Scenario 1: Benchmark

- Reference Benchmark performance equivalent to the national average Data Centre performance that is approximately an annual average Power Usage Effectiveness (PUE) of 1.55. This Benchmark performance exceeds the NABERS Energy for Data Centres Infrastructure minimum 3 Star performance as demanded by the SEARS requirements. Note this is not representative of the design but a hypothetical reference.

Scenario 2: Design Measures

- Includes the targeted project design features that maximise energy efficiency avoiding associated emissions in support of the targeted annual average PUE of 1.25 and are described under '*Avoid and Reduce*' in Section 2.3.

Scenario 3: All Measures

- Includes all pursued emissions mitigation measures for the design and energy sourcing/offsets as described under both '*Avoid and Reduce*' and '*Substitute and Offset*' in Section 2.3.

For each scenario, the 'Maximum Throughput' and 'Operational Throughput' has been considered in accordance with the NSW Guide for Large Emitters requirements for the estimation of Scope 1 and 2 emissions. 'Maximum Throughput' has been based on operating the project at 90% IT equipment load at all times however it is noted that this is implausible to occur due to the variation in IT equipment utilisation that will occur in operation. 'Operational Throughput' has been based on an estimated likely annual average IT equipment loading of 75% considered to occur in operation.

3.2 Emissions Sources and Scopes

The GHG emissions estimates consider the project sources of emissions per the emissions scope as described in the following sections.

3.2.1 Scope 1 Sources

Scope 1 relates to the direct emissions from sources under the proponent's operational control within the boundary of the project that includes:

- Diesel consumption from testing backup generators; and
- Refrigerants included in main chiller plant.

Diesel Consumption Emissions from Backup Generator Testing

The project is proposed to include a total of 249 backup generators powered by diesel engines with varying outputs. This includes:

- 246no. 2,800 kWe (ESP) backup generators
- 3no. 1,000 kWe (ESP) backup generators

To ensure proper operation and readiness for backup power provision, the generators undergo regular testing. The on-site diesel consumption produces Scope 1 GHG emissions.

Table 4 & Table 5 detail the calculated estimates of diesel fuel consumed per year for the project due to regular testing of all backup generators and associated energy consumption using the energy content of 38.6 MJ/L from the National Greenhouse Accounts Factors (2025). This is based on the estimated run times provided by the project team per test loads and fuel consumption at the test loads based on the nominal generator unit selections.

Table 4: Annual diesel consumption for 246no. 2,800 kWe diesel backup generators

Test Type	No. Generators Tested	Test Load (%)	Diesel Consumption at load (L/hr)	Annual Testing Diesel Consumption (L)
Annual (1 hr + 5 min. cooldown)	246	1 hr at 100% load + 5 min. at 5% load	765.5 L/hr at 100% load + 137.6 L/hr at 5% load	189,098
Six-monthly (30 min. + 5 min. cooldown)	246	30 min. at 100% load + 5 min. at 5% load	765.5 L/hr at 100% load + 137.6 L/hr at 5% load	94,941
Quarterly (30 min. + 5 min. cooldown)	246	30 min. at 50% load + 5 min. at 5% load	421.1 L/hr at 100% load + 137.6 L/hr at 5% load	105,160
			Total Diesel Consumption (L/yr)	**389,199**
			Annual Diesel Energy Consumption (GJ/yr)	*15,023*

Table 5: Annual diesel consumption for 3no. 1,000 kWe diesel backup generators

Test Type	No. Generators Tested	Test Load (%)	Diesel Consumption at load (L/hr)	Annual Testing Diesel Consumption (L)
Annual (1 hr + 5 min. cooldown)	3	1 hr at 100% load + 5 min. at 5% load	251.0 L/hr at 100% load + 12.55 L/hr at 5% load	756
Six-monthly (30 min. + 5 min. cooldown)	3	30 min. at 100% load + 5 min. at 5% load	251.0 L/hr at 100% load + 12.55 L/hr at 5% load	380
Quarterly (30 min. + 5 min. cooldown)	3	30 min. at 50% load + 5 min. at 5% load	130.0 L/hr at 100% load + 12.55 L/hr at 5% load	396
			Total Diesel Consumption (L/yr)	**1,532**
			Annual Diesel Energy Consumption (GJ/yr)	*59*

For Benchmark Scenario 1, the diesel consumption has been increased to reflect the increased backup generation capacity necessary to support the less efficient data centre performance (PUE 1.55). The diesel consumption has been prorated for Buildings 1 & 2 based on peak IT capacity. Note there is no difference in the diesel consumption between the assessment scenarios 2 and 3 as these require the same backup generation capacity.

Emissions from Refrigerant Use in Chiller Plant

The project is proposed to include the following central plant:

- For Building 1
  - 10no. air-cooled chillers at 3.4MWr rated capacity each coupled with 10no. hybrid dry coolers at 1.542MWr rated capacity to each
- For Building 2
  - 12no. hybrid dry coolers at 4.6MWr rated capacity each coupled with 12no. water-cooled chillers at 4.1MWr to serve 15 data halls (total IT load of 180MW) of Building 2
  - 12no. hybrid dry coolers at 3.1MWr rated capacity each coupled with 12no. water-cooled chillers at approximately 2.7MWr to serve 4 data halls (total IT load of 48MW) of Building 2

The nominal chiller unit selections are proposed to utilise R-1234ze refrigerant for the air-cooled chillers and R-1233zd for the water-cooled chillers used in Scenarios 2 & 3. Refrigerant type R-134A is assumed for use in the Benchmark scenario. Scope 1 GHG emissions are associated with the chiller refrigerants leaking over the operational life and lost during unit decommissioning at the end of life. Note the Hybrid Dry Coolers do not contain refrigerant.

Table 6 detail the proposed chiller plant details and a calculation estimate of emissions associated with annual refrigerant loss and at the end of plant life.

Table 6: Refrigerants in chiller plant

Chiller Plant Across Building 1 and Building 2		
Parameter	**Scenario 1**	**Scenarios 2 & 3**
Air-cooled Chiller Unit Cooling Capacity (kWr)	Building 1 - 1.542MWr	Building 1 - 1.542MWr
Water-cooled Chiller Unit Cooling Capacity (kWr)	Building 2 - 6.8MWh	Building 2 - 6.8MWh
Number of Air-cooled Chiller	Building 1 - 10	Building 1 - 10
Number of Water-cooled Chiller	Building 2 - 24	Building 2 - 24
Air-cooled Chiller Compressor Type	Centrifugal	Centrifugal
Water-cooled Chiller Compressor Type	Centrifugal	Centrifugal
Air-cooled Refrigerant Type	R-134A	R-1234ze
Water-cooled Refrigerant Type	R-134A	R-1233zd
Air-cooled Chiller Refrigerant Charge per Unit (kg)	444 kg	444 kg
Water-cooled Chiller Refrigerant Charge per Unit (kg)	1,100 kg	1,100 kg
Air-cooled Chiller Refrigerant GWP (kg-CO_2-e)	1,300	1
Water-cooled Chiller Refrigerant GWP (kg-CO_2-e)	1,300	1
Total Refrigerant Quantity (kg)	**30,840**	**30,840**
Annual Leakage Rate	5%	5%
Annual Emissions from Leakage (t-CO_2-e/yr)	**2,005**	**1.54**
Design Life (yrs)	25	25
End of Life Loss	10%	10%
End of Life Emissions (t-CO_2-e/ 25 years)	**4,009**	**3.08**

Refrigerant leakage has been assumed equal in the assessment of both 'Maximum Throughput' and 'Operational Throughput' irrespective of IT equipment utilisation.

3.2.2 Scope 2 Sources

Scope 2 relates to the indirect emissions resulting from the consumption of imported electricity from the local electricity grid covering the following applicable to the project:

- Data Centre Infrastructure (non-IT) plant, including mechanical air conditioning and ventilation, lighting, hydraulic plant, generator standby power, UPS and other electrical system losses
- Office Base Building services

Imported electricity across the assessment scenarios (see Section 2.1.2) has differences due to the elements summarised below:

- **Scenario 1 Benchmark:** Data Centre infrastructure performance at the approximate national average annual PUE of 1.55 and typical office base building performance.
- **Scenario 2 Design Measures:** Data Centre performance improved to the target annual average PUE of 1.25 due to pursued design energy efficiency measures and typical office base building performance.
- **Scenario 3 All Measures:** Per Scenario 2 with the procurement of 100% renewable electricity for all non-IT operational energy use within the facility and data halls.

Table 7 details the results of the predictive estimate of electricity consumed for the project per year considering 'Operational Throughput' by the Data Centre Infrastructure and Office Base Building services across the three project scenarios as described in Section 2.1.2.

Table 7: Estimated Proponent data centre infrastructure and office annual electricity consumption

Electricity End Use	**Annual Electricity Consumption (MWh/yr)**			
	Operational Throughput		Maximum Throughput	
	Scenario 1 Benchmark	*Scenario 2 and 3 Design and All Measures*	*Scenario 1 Benchmark*	*Scenario 2 and 3 Design and All Measures*
Building 1 Data Centre Infrastructure	431,829	195,655	518,194	234,786
Building 2 Data Centre Infrastructure	820,474	371,745	984,569	446,094
Office Base Building	105,774	105,774	105,774	105,774
Total Electricity Use (MWh/yr)	**1,358,077**	**673,174**	**1,638,507**	**786,654**

3.2.3 Scope 3 Sources

Scope 3: Relates to the indirect emissions (other than Scope 2) that are generated in the wider economy including the following attributable to the project that have been considered for the assessment:

- Supply of diesel for the testing of backup generators;
- Tenant IT equipment within the data centre (tenant electricity use is outside the control of the proponent)
- Construction and materials embodied emissions;

GHG emissions from tenant IT equipment electricity consumption are classified as Scope 3 emissions for the Proponent as per the GHG Protocol and the Large Emitters Guide Appendix B. This is due to the Tenant have operational control over their IT equipment and associated electricity use that falls into the Scope 3 emissions category of "Downstream Leased Assets" from the perspective of the Proponent as the building owner.

Table 8 outlines the estimate of tenant IT equipment electricity consumption utilised for the assessment of Scope 3 emissions. Note there is no difference in the annual electricity consumption of the tenant IT equipment across the assessment scenarios described in Section 2.1.2 as the tenant IT equipment are utilised to satisfy tenant needs that is out of the control of the proponent.

Table 8: Estimated Tenant IT Equipment annual electricity consumption

Electricity End Use	**Annual Electricity Consumption (MWh/yr)**	
	Operational Throughput	Maximum Throughput
	All Scenarios	*All Scenarios*
Building 1 IT Equipment	788,400	946,080
Building 2 IT Equipment	1,497,960	1,797,552
Total IT Equipment Electricity Use (MWh/yr)	**2,286,360**	**2,743,632**

Scope 3 emissions associated with the project diesel are based on the diesel volume consumed for the backup generation testing as described in Section 3.2.1 with the Scope 3 emissions factor applied per the National Greenhouse Accounts Factors (2025). The calculation of Scope 3 emissions associated with the project diesel is captured in Section 3.5.2 of this report.

The calculation of emissions associated with the project construction and materials has utilised materials quantities provided by the project quantity surveyor as detailed in the NABERS Embodied Materials Form provided with the project SSDA submission. The material quantities have then been included in the NABERS Embodied Carbon Calculator to establish the associated emissions for the product and construction stages corresponding to the Building Life Cycle modules A1 to A5 as follows:

- A1 - Raw material supply, including extraction, processing and transportation of raw materials used in the building construction
- A2 - Transportation of raw materials to manufacturing facilities
- A3 - Manufacturing processes of building products and components
- A4 - Transportation of all manufactured products and components to the building site
- A5 - Construction and installation, including on-site activities related to building assembly, installation, and any waste generated during construction

The calculations of the Scope 3 emissions associated with the project construction and materials are summarised in Section 3.5.2 of this report.

3.3 Mitigation Measures

In accordance with EPA expectations as detailed within the NSW Guide for Large Emitters, the emissions mitigation hierarchy as detailed below in Figure 2 has been following in pursuit of mitigation measures for the project. This

includes efforts to first avoid then reduce emissions through design followed by considering measures to replace (substitute) high-emission energy sources with low-emission ones, before offsetting residual emissions to meet emissions goals.

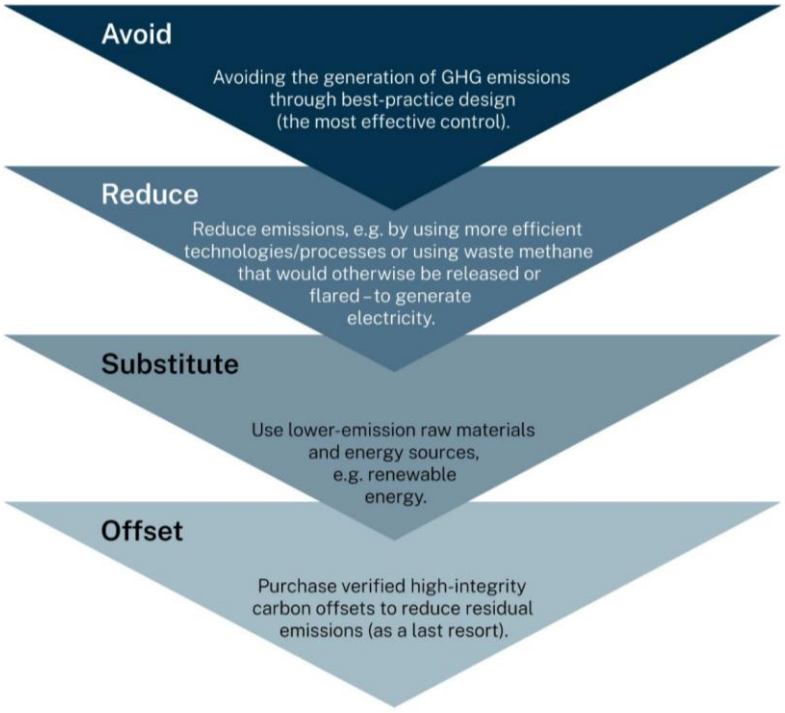

Figure 2: GHG Emissions Mitigation Hierarchy (source: NSW Guide for Large Emitters)

Detailed below are summaries of the measures being pursued by the proponent for the project to mitigate GHG emissions prioritised and categorised according to the mitigation hierarchy above.

Avoid and Reduce

The following energy efficient design features considered best-practice are being pursued for the design to support the Power Usage Effectiveness (PUE) target of 1.25 annual average:

- Elevated data hall cooling setpoint temperature and relaxed humidity setpoints combined with direct to chip liquid cooling capability to maximise efficiency of mechanical plant
- Waterside economy cycle / free cooling from hybrid dry coolers to the bulk of the data hall when ambient conditions allow bypassing chiller operation to further reduce energy consumption
- High efficiency chiller plant through modern compressor technology coupled with elevated operational chilled water temperatures due to relaxed hall conditions and direct to chip liquid cooling
- On-site PV maximised to the available roof space with a targeted rated output capacity in the order of a minimum 1,200 kWe across the site.
- High efficiency LED lighting selections throughout to minimise demand coupled with occupant responsive controls to minimise operational time and associated energy consumption
- Low absorptivity / high Solar Reflective Index (SRI) building external finishes to reduce radiant heat gains
- High performance fabric / glazing to the office spaces and glazing shading to reduce thermal loads

- Chiller plant utilising 4th generation refrigerants with very low global warming potential (GWP) of 1 compared to GWP 1300+ for previous generation refrigerants scheduled for phase out

Measures described above are those included in assessment '*Scenario 2: Design Measures*' per Section 3.1.2.

Substitute and Offset

The proponent is committed to :

- Procuring 100% renewable electricity (e.g. Power Purchase Agreement (PPA) for accredited GreenPower) for all non-IT operational energy use within the facility and data halls from the start of operation; and
- Supporting net-zero carbon (scope 1 & 2) operations by 2050 in alignment with the NSW Government's target through consideration of a combination of the following measures:
  - Utilisation of renewable diesel for backup generators subject to availability of a viable source and suitability of operation in selected equipment.
  - Purchase of offsets for diesel fuel emissions and refrigerant emissions.
- Work with prospective Tenant(s) to minimise or eliminate the GHG emissions associated with their electricity use, through the procurement of renewable electricity on the Tenant(s) behalf, as required.

The GHG emissions associated with diesel usage have been based on the NGA factors without adjustment over the life of asset due to the uncertainty of renewable diesel supply, for assessment purposes.

Note for any offsets pursued for residual emissions, it will be ensured that the integrity principles of the *Commonwealth Carbon Credits Act 2011* and *Climate Active Carbon Neutral Standard for Organisations* are met such that a genuine credit emissions reduction is supported. Australian Carbon Credit Units (ACCUs) will be pursued as a first priority for the offset of residual emissions with consideration given to NSW based offset projects, where available and cost-effective, as preferred by the NSW EPA.

In addition to the above best practice design features to be in place from operational commencement, and commitments to substitute & offset emissions, the proponent is committed to consider emerging technologies and other methods for reducing emissions over the life of the project. This will include reviewing the market for:

- Services plant such as chillers with greater energy efficiency for selection at the end of life of current plant,
- Customer IT equipment with lower heat loads and/or that provide a more efficient means of dealing with heat loads (e.g. can operate at higher temperatures than current technology)

Measures described under both 'Avoid and Reuse' and 'Substitute and Offset' above are included in assessment '*Scenario 3: All Measures*' per Section 3.1.2.

3.4 Assessment Assumptions

The following assumptions were used to development the emissions estimates:

- Chiller unit refrigerant leakage rate of 5% per annum and 10% end of life loss
- Chiller refrigerant charge amount has been based on manufacturer technical product specifications
- Diesel consumption from generator testing based on anticipated testing regime provided by project team and nominal equipment fuel consumption rates for test loads
- National average data centre annual Power Usage Effectiveness (PUE) approximated at 1.55 based on several data sources

- Operational electricity consumption based on that estimated by the project team
- 'Operational Throughput' has been based on an estimated likely annual average IT equipment loading of 75% considered to occur in operation.
- 'Maximum Throughput' has been based on an estimated annual average IT equipment loading of 90% noting this is implausible to occur due to the variation in IT equipment utilisation that will occur in operation.
- Materials embodied carbon and construction related emissions based on the materials quantities provided by the project Quantity Surveyor as described in the NABERS Embodied Emissions Materials Form and emissions estimated using the NABERS Embodied Emissions calculator

3.5 Emissions Estimate

The following Greenhouse Gas (GHG) emissions estimations are based on the assessment boundary as described in Section 3.1.1 for the scenarios as described in Section 3.1.2 considering the emissions sources and scopes as described in Section 3.2.

The GHG emissions have been estimated using the emissions factors as detailed in the following table. Factors have been sourced from the latest National Greenhouse Accounts Factors (2025) and Australia's Emissions Projections (2026) both published by the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Table 9: Australian National Greenhouse Accounts Factors (2024) Relevant to Assessment

Source	Year	Emissions Factors (kg-CO_2-e / unit)			Unit
		Scope 1	*Scope 2*	*Scope 3*	
Diesel Oil	All years	70.2[1]	-	17.3	GJ
NSW Electricity	2026	-	0.55	0.02	kWh
	2027	-	0.50	0.02	
	2028	-	0.38	0.02	
	2029	-	0.24	0.01	
	2030	-	0.11	0.01	
	2031	-	0.09	0.00	
	2032	-	0.09	0.01	
	2033	-	0.08	0.01	
	2034	-	0.07	0.00	
	2035	-	0.07	0.01	
	2036	-	0.08	0.00	
	2037	-	0.08	0.00	
	2038	-	0.08	0.00	
	2039	-	0.08	0.00	
	2040	-	0.08	0.00	
	2050	-	0	0	

Note: 1. Diesel factor is the carbon dioxide equivalent (CO_2-e) total covering the combined gases emissions of CO_2, CH_4 and N_2O

The emissions factors detailed above have been utilised for Scenario 1 Benchmark and Scenario 2 Design Measures. For Scenario 3 All Measures the emissions factors have been adjusted according to the emissions mitigation measures as described under '*Substitute and Offset*' in Section 3.3, namely the removal of scope 2 emissions for infrastructure electricity usage.

3.5.1 Scope 1 and 2 Emissions Estimates

Operational Throughput

The following table details the Scope 1 and 2 emissions estimates for the project activity data based on the Operational Throughput over the predicted project design life for the Design Measures scenario 2, with the lifetime totals compared to the Benchmark scenario 1. Refer to Appendix B for the full breakdown of emissions across all sources that corresponds to the table data.

*Table 10: Scope 1 & 2 Emissions ($t\text{-}CO_2\text{-}e$) Estimation – **Operational** Throughput – **Design Measures Scenario 2***

Year	Scope 1 ($t\text{-}CO_2\text{-}e$)	Scope 2 ($t\text{-}CO_2\text{-}e$)	*Total Scope 1 + 2 ($t\text{-}CO_2\text{-}e$)*
2026	0	0	*0*
2027	0	0	*0*
2028	30	6,196	*6,226*
2029	195	25,044	*25,239*
2030	494	29,055	*29,549*
2031	713	34,338	*35,051*
2032	932	44,903	*45,835*
2033	1,054	45,131	*46,185*
2034	1,060	39,718	*40,778*
2035	1,060	39,718	*40,778*
2036	1,060	45,392	*46,452*
2037	1,060	45,392	*46,452*
2038	1,060	45,392	*46,452*
2039	1,060	45,392	*46,452*
2040	1,060	45,392	*46,452*
2041	1,060	45,392	*46,452*
2042	1,060	45,392	*46,452*
2043	1,060	45,392	*46,452*
2044	1,060	45,392	*46,452*
2045	1,060	45,392	*46,452*
2046	1,060	45,392	*46,452*
2047	1,060	45,392	*46,452*
2048	1,060	45,392	*46,452*
2049	1,060	45,392	*46,452*
2050	1,060	0	*1,060*
2051	1,060	0	*1,060*
2052	1,060	0	*1,060*
2053	1,060	0	*1,060*
2054	1,060	0	*1,060*
2055	1,060	0	*1,060*
2056	1,060	0	*1,060*
2057	1,060	0	*1,060*
2058	1,060	0	*1,060*
2059	1,060	0	*1,060*
2060	1,060	0	*1,060*
2061	1,060	0	*1,060*

2062	1,060	0	*1,060*
2063	1,060	0	*1,060*
2064	1,060	0	*1,060*
2065	1,060	0	*1,060*
2066	1,060	0	*1,060*
2067	1,060	0	*1,060*
2068	1,060	0	*1,060*
2069	1,060	0	*1,060*
2070	1,060	0	*1,060*
2071	1,060	0	*1,060*
2072	1,060	0	*1,060*
2073	1,060	0	*1,060*
2074	1,060	0	*1,060*
2075	1,060	0	*1,060*
2076	1,060	0	*1,060*
2077	1,060	0	*1,060*
2078	1,060	0	*1,060*
2079	1,060	0	*1,060*
2080	1,060	0	*1,060*
Total	**53,254**	**899,591**	***952,844***
Benchmark Totals	*167,191*	*1,985,476*	*2,152,668*
Difference	-113,938	-1,085,885	-1,199,823
% Difference	*-68.1%*	*-54.7%*	*-55.7%*

The following table details the Scope 1 and 2 emissions estimates for the project activity data based on the Operational Throughput over the predicted project design life for the All Measures scenario 3, with the lifetime totals compared to the Benchmark scenario 1. Refer to Appendix B for the full breakdown of emissions across all sources that corresponds to the table data.

*Table 11: Scope 1 & 2 Emissions (t-CO_2-e) Estimation – **Operational** Throughput – **All Measures Scenario 3***

Year	Scope 1 (t-CO_2-e)	Scope 2 (t-CO_2-e)	*Total Scope 1 + 2 (t-CO_2-e)*
2026	0	0	*0*
2027	0	0	*0*
2028	30	0	*30*
2029	195	0	*195*
2030	494	0	*494*
2031	713	0	*713*
2032	932	0	*932*
2033	1,054	0	*1,054*
2034	1,060	0	*1,060*
2035	1,060	0	*1,060*
2036	1,060	0	*1,060*
2037	1,060	0	*1,060*
2038	1,060	0	*1,060*
2039	1,060	0	*1,060*

2040	1,060	0	*1,060*
2041	1,060	0	*1,060*
2042	1,060	0	*1,060*
2043	1,060	0	*1,060*
2044	1,060	0	*1,060*
2045	1,060	0	*1,060*
2046	1,060	0	*1,060*
2047	1,060	0	*1,060*
2048	1,060	0	*1,060*
2049	1,060	0	*1,060*
2050	1,060	0	*1,060*
2051	0	0	*0*
2052	0	0	*0*
2053	0	0	*0*
2054	0	0	*0*
2055	0	0	*0*
2056	0	0	*0*
2057	0	0	*0*
2058	0	0	*0*
2059	0	0	*0*
2060	0	0	*0*
2061	0	0	*0*
2062	0	0	*0*
2063	0	0	*0*
2064	0	0	*0*
2065	0	0	*0*
2066	0	0	*0*
2067	0	0	*0*
2068	0	0	*0*
2069	0	0	*0*
2070	0	0	*0*
2071	0	0	*0*
2072	0	0	*0*
2073	0	0	*0*
2074	0	0	*0*
2075	0	0	*0*
2076	0	0	*0*
2077	0	0	*0*
2078	0	0	*0*
2079	0	0	*0*
2080	0	0	*0*
Total	**21,444**	**0**	***21,444***
Benchmark Totals	*167,191*	*1,985,476*	*2,152,668*
Difference	-145,747	-1,985,476	-2,131,223
% Difference	*-87.2%*	*-100.0%*	*-99.0%*

Maximum Throughput

The following table details the Scope 1 and 2 emissions estimates for the project activity data based on the Maximum Throughput over the predicted project design life for the Design Measures scenario 2, with the lifetime totals compared to the Benchmark scenario 1. Refer to Appendix B for the full breakdown of emissions across all sources that corresponds to the table data.

Note that the Maximum Throughput calculations based on the project at 90% IT equipment load at all times is implausible to occur in operation due to the variation in IT equipment utilisation that will occur in operation.

*Table 12: Scope 1 & 2 Emissions ($t\text{-}CO_2\text{-}e$) Estimation – **Maximum** Throughput – **Design Measures Scenario 2***

Year	Scope 1 ($t\text{-}CO_2\text{-}e$)	Scope 2 ($t\text{-}CO_2\text{-}e$)	*Total Scope 1 + 2 ($t\text{-}CO_2\text{-}e$)*
2026	0	0	*0*
2027	0	0	*0*
2028	30	7,435	*7,465*
2029	195	30,053	*30,248*
2030	494	34,866	*35,360*
2031	713	41,205	*41,918*
2032	932	53,883	*54,816*
2033	1,054	54,157	*55,212*
2034	1,060	47,662	*48,722*
2035	1,060	47,662	*48,722*
2036	1,060	54,470	*55,531*
2037	1,060	54,470	*55,531*
2038	1,060	54,470	*55,531*
2039	1,060	54,470	*55,531*
2040	1,060	54,470	*55,531*
2041	1,060	54,470	*55,531*
2042	1,060	54,470	*55,531*
2043	1,060	54,470	*55,531*
2044	1,060	54,470	*55,531*
2045	1,060	54,470	*55,531*
2046	1,060	54,470	*55,531*
2047	1,060	54,470	*55,531*
2048	1,060	54,470	*55,531*
2049	1,060	54,470	*55,531*
2050	1,060	0	*1,060*
2051	1,060	0	*1,060*
2052	1,060	0	*1,060*
2053	1,060	0	*1,060*
2054	1,060	0	*1,060*
2055	1,060	0	*1,060*
2056	1,060	0	*1,060*
2057	1,060	0	*1,060*
2058	1,060	0	*1,060*
2059	1,060	0	*1,060*
2060	1,060	0	*1,060*

2061	1,060	0	*1,060*
2062	1,060	0	*1,060*
2063	1,060	0	*1,060*
2064	1,060	0	*1,060*
2065	1,060	0	*1,060*
2066	1,060	0	*1,060*
2067	1,060	0	*1,060*
2068	1,060	0	*1,060*
2069	1,060	0	*1,060*
2070	1,060	0	*1,060*
2071	1,060	0	*1,060*
2072	1,060	0	*1,060*
2073	1,060	0	*1,060*
2074	1,060	0	*1,060*
2075	1,060	0	*1,060*
2076	1,060	0	*1,060*
2077	1,060	0	*1,060*
2078	1,060	0	*1,060*
2079	1,060	0	*1,060*
2080	1,060	0	*1,060*
Total	**53,254**	**1,079,509**	***1,132,763***
Benchmark Totals	*167,191*	*2,382,571*	*2,549,763*
Difference	-113,938	-1,303,062	-1,417,000
% Difference	*-68.1%*	*-54.7%*	*-55.6%*

The following table details the Scope 1 and 2 emissions estimates for the project activity data based on the Maximum Throughput over the predicted project design life for the All Measures scenario 3, with the lifetime totals compared to the Benchmark scenario 1. Refer to Appendix B for the full breakdown of emissions across all sources that corresponds to the table data.

Note that the Maximum Throughput calculations based on the project at 90% IT equipment load at all times is implausible to occur in operation due to the variation in IT equipment utilisation that will occur in operation.

*Table 13: Scope 1 & 2 Emissions (t-CO_2-e) Estimation – **Maximum** Throughput – **All Measures Scenario 3***

Year	Scope 1 (t-CO_2-e)	Scope 2 (t-CO_2-e)	*Total Scope 1 + 2 (t-CO_2-e)*
2026	0	0	*0*
2027	0	0	*0*
2028	30	0	*30*
2029	195	0	*195*
2030	494	0	*494*
2031	713	0	*713*
2032	932	0	*932*
2033	1,054	0	*1,054*
2034	1,060	0	*1,060*
2035	1,060	0	*1,060*
2036	1,060	0	*1,060*

2037	1,060	0	*1,060*
2038	1,060	0	*1,060*
2039	1,060	0	*1,060*
2040	1,060	0	*1,060*
2041	1,060	0	*1,060*
2042	1,060	0	*1,060*
2043	1,060	0	*1,060*
2044	1,060	0	*1,060*
2045	1,060	0	*1,060*
2046	1,060	0	*1,060*
2047	1,060	0	*1,060*
2048	1,060	0	*1,060*
2049	1,060	0	*1,060*
2050	1,060	0	*1,060*
2051	0	0	*0*
2052	0	0	*0*
2053	0	0	*0*
2054	0	0	*0*
2055	0	0	*0*
2056	0	0	*0*
2057	0	0	*0*
2058	0	0	*0*
2059	0	0	*0*
2060	0	0	*0*
2061	0	0	*0*
2062	0	0	*0*
2063	0	0	*0*
2064	0	0	*0*
2065	0	0	*0*
2066	0	0	*0*
2067	0	0	*0*
2068	0	0	*0*
2069	0	0	*0*
2070	0	0	*0*
2071	0	0	*0*
2072	0	0	*0*
2073	0	0	*0*
2074	0	0	*0*
2075	0	0	*0*
2076	0	0	*0*
2077	0	0	*0*
2078	0	0	*0*
2079	0	0	*0*
2080	0	0	*0*
Total	**21,444**	**0**	***21,444***
Benchmark Totals	*167,191*	*2,382,571*	*2,549,763*
Difference	-145,747	-2,382,571	-2,528,318
% Difference	*-87.2%*	*-100.0%*	*-99.2%*

3.5.2 Scope 3 Emissions Estimates

Upfront Materials and Construction Emissions

The project upfront scope 3 emissions have been outlined in the table below as the aggregation of the upfront carbon emissions of the product and construction stages (i.e. Building Life Cycle modules A1 to A5). The emissions have been established using the NABERS Embodied Carbon Calculator based on project materials quantity data across the entire project (Building 1 and Building 2) per the NABERS Embodied Materials Form provided with the SSDA submission.

Table 14: Estimated Scope 3 Emissions(t-CO_2-e) from Upfront Materials and Construction Elements

Module	Scope 3 Emissions (t-CO_2-e)
Materials, A1-A3	319,045
Transport, A4	8,597
Construction, A5	10,794
Total Scope 3 Emissions	**338,436**

As seen above, the majority of the upfront materials and construction Scope 3 emissions are tied with the product stage (i.e. Modules A1 to A3). These emissions can be reduced through measures such as procurement of lower carbon construction materials and recycled materials where possible. The proponent is committed to the pursuit of lower carbon construction materials such as concretes with SCM content and recycled materials such as for structural and reinforcing steels where possible. No life cycle impacts assessment has been undertaken at this stage to determine potential emission reductions that may be supported by pursued initiatives.

Overall Scope 3 Emissions Projection

The following table details the Scope 3 emissions estimates for the project activity data based on the Operational Throughput over the predicted project design life for the Design Measures scenario.

The following table details the Scope 3 emissions estimates for the project activity data based across all scenarios, with the lifetime totals compared to the Benchmark scenario 1. Refer to Appendix B.2 for the full breakdown of emissions across all sources that corresponds to the table data. Note that Scope 3 emissions for IT equipment electricity consumption is included below but is under the responsibility of Tenant(s) and out of the control of the Proponent.

Table 15: Scope 3 Emissions (t-CO_2-e) Estimation

Throughput	Operational		Maximum	
Scenario	**Scenario 1 Benchmark**	**Scenario 2 & 3 Design/All Measures**	**Scenario 1 Benchmark**	**Scenario 2 & 3 Design/All Measures**
Year	**Scope 3 Emissions (t-CO_2-e)**			
2026	0	0	0	0
2027	9,336	9,336	9,336	9,336
2028	100,765	100,369	106,165	105,691
2029	265,264	263,993	286,748	285,225
2030	231,264	228,047	257,974	254,119

2031	138,582	138,540	166,255	166,212
2032	212,338	206,261	254,749	247,467
2033	217,363	210,491	260,771	252,537
2034	160,369	160,306	192,378	192,315
2035	195,755	188,844	234,842	226,560
2036	183,232	183,170	219,814	219,751
2037	183,232	183,170	219,814	219,751
2038	183,232	183,170	219,814	219,751
2039	183,232	183,170	219,814	219,751
2040	183,232	183,170	219,814	219,751
2041	183,232	183,170	219,814	219,751
2042	183,232	183,170	219,814	219,751
2043	183,232	183,170	219,814	219,751
2044	183,232	183,170	219,814	219,751
2045	183,232	183,170	219,814	219,751
2046	183,232	183,170	219,814	219,751
2047	183,232	183,170	219,814	219,751
2048	183,232	183,170	219,814	219,751
2049	183,232	183,170	219,814	219,751
2050	324	261	324	261
2051	324	261	324	261
2052	324	261	324	261
2053	324	261	324	261
2054	324	261	324	261
2055	324	261	324	261
2056	324	261	324	261
2057	324	261	324	261
2058	324	261	324	261
2059	324	261	324	261
2060	324	261	324	261
2061	324	261	324	261
2062	324	261	324	261
2063	324	261	324	261
2064	324	261	324	261
2065	324	261	324	261
2066	324	261	324	261
2067	324	261	324	261
2068	324	261	324	261
2069	324	261	324	261
2070	324	261	324	261
2071	324	261	324	261
2072	324	261	324	261
2073	324	261	324	261
2074	324	261	324	261
2075	324	261	324	261
2076	324	261	324	261
2077	324	261	324	261
2078	324	261	324	261

2079	324	261	324	261
2080	324	261	324	261
Total	**4,106,318**	**4,078,650**	**4,856,644**	**4,824,072**
Difference to Benchmark		-27,688		-32,572
% Difference		*-0.674%*		*-0.671%*

3.5.3 Emissions Estimate Summary

The following table details a summary of the Scope 1 and 2 GHG emissions estimates associated with the project over the design life for the assessment scenarios as detailed in Section Assessment Scenarios for the expected Operational Throughput. The annual average has also been provided based on the project life from construction commencement and through all operational years.

Table 16: Design Life Scope 1 & 2 Emissions (t-CO_2-e) Estimate Summary Across Assessment Scenarios – Operational Throughput

Item	**GHG Emissions (t-CO_2-e/yr)**		
Emissions Scope	*Scenario 1 Benchmark*	*Scenario 2 Design Measures*	*Scenario 3 All Measures*
Scope 1	167,191	53,254	21,444
Scope 2	1,985,476	899,591	0
Subtotal 1 + 2	**2,152,668**	**952,844**	**21,444**
Percentage Difference to Benchmark		*-55.7%*	*-99.0%*
Average Annual 1 + 2 (t-CO_2/year)	39,139	17,324	390

Considering the project Design Measures of Scenario 2 being incorporated to avoid and reduce emissions per the mitigation hierarchy, a significant reduction in emissions compared to Scenario 1 Benchmark is being supported estimated at 55.7% for that under the Proponent's control. Following the inclusion of substitute and offset pursued initiatives under the All Measures Scenario 3, scope 1 and 2 emissions under the Proponents control are close to eliminated over the project design life, and a significant reduction of 99.0% is seen.

The following table provides the same summary data with the inclusion of Scope 3 emissions. From these details it can be seen that compared to the Benchmark position a 19.6% reduction in emissions for that under the Proponent's control, and with the inclusion of Tenant emissions also, are supported for the project considering All Measures of mitigation by 34.5%.

Table 17: Design Life Scope 1, 2 & 3 Emissions (t-CO_2-e) Estimate Summary Across Assessment Scenarios – Operational Throughput

Item	**GHG Emissions (t-CO_2-e/yr)**		
Emissions Scope	*Scenario 1 Benchmark*	*Scenario 2 Design Measures*	*Scenario 3 All Measures*
Scope 1	167,191	53,254	21,444
Scope 2	1,985,476	899,591	0
Scope 3 – Proponent	399,524	371,856	371,856
Scope 3 – Tenant Scope 2	3,706,794	3,706,794	3,706,794
Total	**6,258,985**	**5,031,495**	**4,100,094**
Percentage Difference to Benchmark		*-19.6%*	*-34.5%*
Average Annual 1 + 2 (t-CO_2/year)	113,800	91,482	74,547

The Proponent is committed to work with prospective Tenant(s) to minimise or eliminate the GHG emissions associated with their electricity use, through the procurement of renewable electricity on the Tenant(s) behalf, as required. Although reductions for these Scope 3 emissions have not been taken within this assessment, it is common place for data centre tenant's across the industry to procure renewable electricity for their operations. This is particularly the case for hyperscale customers that have public commitment to procure renewable electricity.

3.5.4 Independent Expert Review Outcome

In accordance with the Section 4.7 of the NSW Guide for Large Emitters, an Independent Expert Review (IER) of the GHG Assessment is being completed as the scope 1 and 2 emissions are estimated to exceed 100,000 tCO_2-e per year at any time during the operational life of the project. The IER is required to be completed by an independent of the project who is suitably qualified for review of the project mitigation assessment and the proposed offset strategies to confirm suitability. Refer to Appendix C for a full copy of the Independent Expert Review report.

The outcome of the Independent Expert Review confirmed that the GHG Assessment Report is compliant with the NSW Guide for Large Emitters. As part of the review process, the following review recommendations were made with details of how the these have been addressed:

Table 17: IER Review Recommendations and Response

IER Review Recommendation	Project Team Response	Report Section Ref.
LCI should include a statement within the GHG Assessment Mitigation Strategy (Section 3.3) that ensures the proponent will consider emerging emissions mitigation technologies where appropriate and feasible throughout the project lifespan.	Description of proponent consideration of emerging technologies over the project life to further reduce emissions has been added.	Section 3.3 & 4.2
To strengthen the claim to purchase offsets for residual emissions, it is recommended to specify the preferred location and type of offsets the proponent intends to acquire. It is also recommended to consider NSW-based offsets, where they are available and cost-effective, as preferred by the NSW EPA.	Description of preference & priority of the type of offsets to be pursued for residual emissions has been added.	Section 3.3 & 4.2

4 Emissions Goals

4.1 Reporting Obligations

A facility is required under the NGER Act to meet the reporting obligations of the act should the facility exceed the threshold of 25,000 t-CO2-e &/or 100 TJ (27,778 MWh) per year of energy consumption. The obligations include reporting emissions data annually across both Scope 1 direct emissions and Scope 2 indirect emissions amongst other relevant energy consumption data. The reported emissions data is disclosed publicly through the Clean Energy Regulator's NGER database.

The project is seen to exceed the threshold of 100 TJ (27,778 MWh) per year per the estimations provided in Section 3.2.2. As such the Proponent will be responsible for providing annual reports per the NGER Act.

Note that response to Safeguard Mechanism and Electricity Firming Infrastructure as requested by the NSW Guide for Large Emitters is not required as these are not applicable to the project. The Safeguard Mechanism applies to projects that emit greater than 100,000 t-CO2-e of Scope 1 emissions in any year which the project does not as can be seen in Section 3.5.1. Electricity Firming Infrastructure applies to grid energy storage / backup technology projects that provide electricity supply when renewable generation is not available that the project is not.

4.2 Goals and Trajectory

The proponent is committed to:

- Minimise project energy needs through incorporation of design initiatives considered best practice that minimise energy demand and maximise energy efficiency limiting scope 1 and 2 emissions;
- Eliminate indirect scope 2 emissions under the Proponent's control by using 100% renewable sourced energy (e.g. Power Purchase Agreement (PPA) for accredited GreenPower) for all non-IT electricity uses of the project from the start of operation (i.e. day 1); and
- Sustain net-zero carbon emissions across scope 1 & 2 under the Proponent's control from year 2050 in alignment with the NSW Government's target through consideration of the following measures individually or in combination to eliminate the remaining scope 1 emissions:
  - Utilisation of renewable diesel for backup generators subject to availability of a viable source and suitability of operation in selected equipment.
  - Purchase of offsets for diesel fuel emissions and refrigerant emissions.
- Work with prospective Tenant(s) to minimise or eliminate the GHG emissions associated with their electricity use, through the procurement of renewable electricity on the Tenant(s) behalf, as required.

Note for any offsets pursued for residual emissions, it will be ensured that the integrity principles of the *Commonwealth Carbon Credits Act 2011* and *Climate Active Carbon Neutral Standard for Organisations* are met such that a genuine credit emissions reduction is supported. Australian Carbon Credit Units (ACCUs) will be pursued as a first priority for the offset of residual emissions with consideration given to NSW based offset projects, where available and cost-effective, as preferred by the NSW EPA.

In addition to the commitments above, the proponent is committed to consider emerging technologies and other methods for reducing emissions over the life of the project. This will include reviewing the market for:

- Services plant such as chillers with greater energy efficiency for selection at the end of life of current plant,
- Customer IT equipment with lower heat loads and/or that provide a more efficient means of dealing with heat loads (e.g. can operate at higher temperatures than current technology).

The following Figure 3 and Figure 4 provide the estimated emissions trajectory of the project taking into account the Proponent's emissions goals, firstly considering scope 1 and 2 emissions then scope 1, 2 and 3 emissions. Scenarios are as per that described in Section 3.1.2.

From the figure the pursued initiatives under the 'Design Measures' scenario provides substantial reduction in emissions compared to the 'Benchmark' over the design life of the project. Further reductions are seen considering 'All Measures' in support of the Proponent's emissions goals.

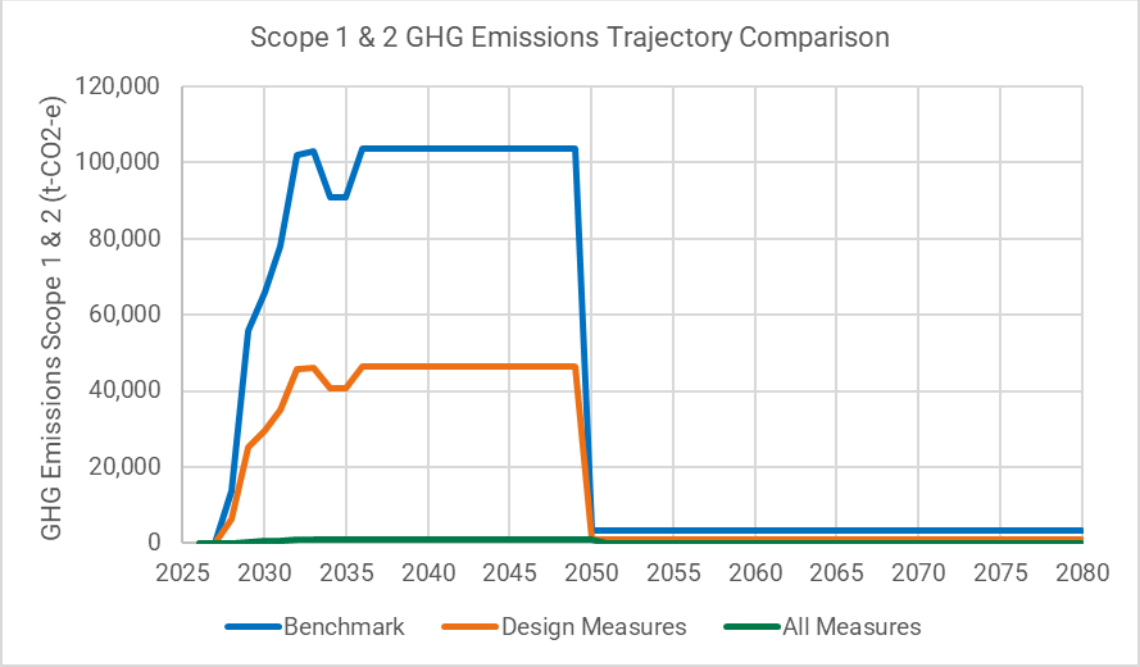

Figure 3: GHG Emissions Trajectory Estimation considering Implementation of Emissions Goals

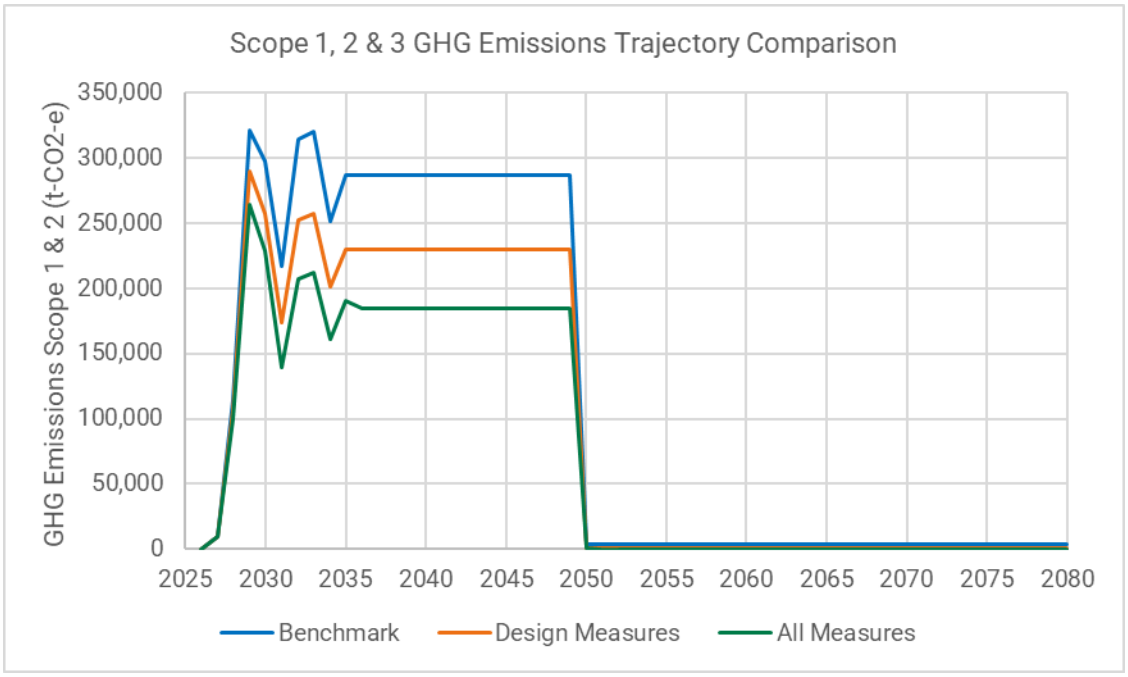

Figure 4: GHG Emissions Trajectory Estimation considering Implementation of Emissions Goals

From Figure 4 considering the Scope 1, 2 and 3 design life emissions, it can be seen that the pursued initiatives in support of the Proponent's emissions goals show:

- A reasonable reduction in emissions for the 'Design Measures' scenario compared to the 'Benchmark';
- Emissions are almost entirely eliminated from 2050 onwards.

5 Conclusion

The GHG Assessments results have shown that:

- The Design Measures being pursued for the proposed development, i.e. measures to reduce energy demand and maximise energy efficiency, provide significant reduction in Scope 1 and 2 emissions compared to a national average performance Benchmark scenario in the order of 55.7% for emissions under the Proponent's control
- Following consideration of All Measures being pursued in support of the Proponent's emissions goals, including a commitment to procure 100% renewable electricity such as through a PPA for accredited GreenPower for all non-IT equipment from day 1 operation and support net-zero emissions (scope 1 & 2) for all non-IT equipment by 2050 in alignment with the NSW Government's target:
  - The Scope 1 & 2 emissions are almost entirely eliminated with a 99.0% reduction compared to a national average Benchmark scenario from day 1 of operation;
  - The Scope 1 & 2 emissions fall well below the NSW Guide for Large Emitters threshold of 25,000 Tonnes CO_2-e/yr at only an estimated 390 t-CO_2-e/yr on average over the project design life.
  - When including scope 3 emissions, a 34.5% reduction is estimated compared to a national average Benchmark scenario.

Appendix A References

Reports and documentation reviewed as part of the investigation for this report includes:

- NSW EPA Guide for Large Emitters
- Australian National Greenhouse Accounts Factors
- NABERS Embodied Carbon Rules
- NABERS Upfront Embodied Carbon Calculator

Appendix B Detailed Emissions and Activity Data

B.1 Scope 1 & 2 Emissions

B.1.1 Operational Throughput

Scenario 1: Benchmark

Note that the following activity and emissions data is for a hypothetical reference to establish a Benchmark for comparison to the actual design performance and emissions. See Section 3.1.2 for further details of the scenario.

*Table 18: Scope 1 & 2 Emissions ($t\text{-}CO_2\text{-}e$) Breakdown Estimation – **Operational** Throughput – **Benchmark Scenario 1***

Scenario	**Benchmark**			
Production	Diesel	Refrigerant	Non-IT Electricity	**Total Scope 1+2 ($t\text{-}CO_2\text{-}e$)**
Production Rate	484.51	30,840	1,252,303	
Units	kL/yr	kg	MWh/yr	
Source	Generators	Chillers	Grid	
Sector	Energy	IPPU	Energy	
Sub Sector	Buildings	ODP	Buildings	
Year	**Scope 1 ($t\text{-}CO_2\text{-}e$)**	**Scope 1 ($t\text{-}CO_2\text{-}e$)**	**Scope 2 ($t\text{-}CO_2\text{-}e$)**	
2026	0	0	0	0
2027	0	0	0	0
2028	38	84	13,675	13,796
2029	241	495	55,274	56,011
2030	611	1,139	64,127	65,877
2031	883	1,503	75,786	78,172
2032	1,154	1,820	99,105	102,079
2033	1,305	1,996	99,608	102,910
2034	1,313	2,005	87,661	90,979
2035	1,313	2,005	87,661	90,979
2036	1,313	2,005	100,184	103,502
2037	1,313	2,005	100,184	103,502
2038	1,313	2,005	100,184	103,502
2039	1,313	2,005	100,184	103,502
2040	1,313	2,005	100,184	103,502
2041	1,313	2,005	100,184	103,502
2042	1,313	2,005	100,184	103,502
2043	1,313	2,005	100,184	103,502
2044	1,313	2,005	100,184	103,502
2045	1,313	2,005	100,184	103,502
2046	1,313	2,005	100,184	103,502
2047	1,313	2,005	100,184	103,502
2048	1,313	2,005	100,184	103,502
2049	1,313	2,005	100,184	103,502
2050	1,313	2,005	0	3,317
2051	1,313	2,005	0	3,317

2052	1,313	2,005	0	3,317
2053	1,313	2,005	0	3,317
2054	1,313	2,005	0	3,317
2055	1,313	2,005	0	3,317
2056	1,313	2,005	0	3,317
2057	1,313	2,005	0	3,317
2058	1,313	2,005	0	3,317
2059	1,313	2,005	0	3,317
2060	1,313	2,005	0	3,317
2061	1,313	2,005	0	3,317
2062	1,313	2,005	0	3,317
2063	1,313	2,005	0	3,317
2064	1,313	2,005	0	3,317
2065	1,313	2,005	0	3,317
2066	1,313	2,005	0	3,317
2067	1,313	2,005	0	3,317
2068	1,313	2,005	0	3,317
2069	1,313	2,005	0	3,317
2070	1,313	2,005	0	3,317
2071	1,313	2,005	0	3,317
2072	1,313	2,005	0	3,317
2073	1,313	2,005	0	3,317
2074	1,313	2,005	0	3,317
2075	1,313	2,005	0	3,317
2076	1,313	2,005	0	3,317
2077	1,313	2,005	0	3,317
2078	1,313	2,005	0	3,317
2079	1,313	2,005	0	3,317
2080	1,313	2,005	0	3,317
Total	**65,938**	**101,253**	**1,985,476**	**2,152,668**

Scenario 2: Design Measures

*Table 19: Scope 1 & 2 Emissions (t-CO_2-e) Breakdown Estimation – **Operational** Throughput – **Design Measures Scenario 2***

Scenario	**Design Measures**			
Production	Diesel	Refrigerant	Non-IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate	390.73	30,840	567,400	
Units	kL/yr	kg	MWh/yr	
Source	Generators	Chillers	Grid	
Sector	Energy	IPPU	Energy	
Sub Sector	Buildings	ODP	Buildings	
Year	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	0	0	0	0
2027	0	0	0	0
2028	30	0	6,196	6,226
2029	195	0	25,044	25,239
2030	493	1	29,055	29,549

2031	712	1	34,338	35,051
2032	931	1	44,903	45,835
2033	1,053	2	45,131	46,185
2034	1,059	2	39,718	40,778
2035	1,059	2	39,718	40,778
2036	1,059	2	45,392	46,452
2037	1,059	2	45,392	46,452
2038	1,059	2	45,392	46,452
2039	1,059	2	45,392	46,452
2040	1,059	2	45,392	46,452
2041	1,059	2	45,392	46,452
2042	1,059	2	45,392	46,452
2043	1,059	2	45,392	46,452
2044	1,059	2	45,392	46,452
2045	1,059	2	45,392	46,452
2046	1,059	2	45,392	46,452
2047	1,059	2	45,392	46,452
2048	1,059	2	45,392	46,452
2049	1,059	2	45,392	46,452
2050	1,059	2	0	1,060
2051	1,059	2	0	1,060
2052	1,059	2	0	1,060
2053	1,059	2	0	1,060
2054	1,059	2	0	1,060
2055	1,059	2	0	1,060
2056	1,059	2	0	1,060
2057	1,059	2	0	1,060
2058	1,059	2	0	1,060
2059	1,059	2	0	1,060
2060	1,059	2	0	1,060
2061	1,059	2	0	1,060
2062	1,059	2	0	1,060
2063	1,059	2	0	1,060
2064	1,059	2	0	1,060
2065	1,059	2	0	1,060
2066	1,059	2	0	1,060
2067	1,059	2	0	1,060
2068	1,059	2	0	1,060
2069	1,059	2	0	1,060
2070	1,059	2	0	1,060
2071	1,059	2	0	1,060
2072	1,059	2	0	1,060
2073	1,059	2	0	1,060
2074	1,059	2	0	1,060
2075	1,059	2	0	1,060
2076	1,059	2	0	1,060
2077	1,059	2	0	1,060
2078	1,059	2	0	1,060

2079	1,059	2	0	1,060
2080	1,059	2	0	1,060
Total	**53,176**	**78**	**899,591**	**952,844**

Scenario 3: All Measures

*Table 20: Scope 1 & 2 Emissions (t-CO_2-e) Breakdown Estimation – **Operational** Throughput – **All Measures Scenario 3***

Scenario	**All Measures**			
Production	Diesel	Refrigerant	Non-IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate	134.73	30,840	567,400	
Units	kL/yr	kg	MWh/yr	
Source	Generators	Chillers	Grid	
Sector	Energy	IPPU	Energy	
Sub Sector	Buildings	ODP	Buildings	
Year	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	0	0	0	0
2027	0	0	0	0
2028	30	0	0	30
2029	195	0	0	195
2030	493	1	0	494
2031	712	1	0	713
2032	931	1	0	932
2033	1,053	2	0	1,054
2034	1,059	2	0	1,060
2035	1,059	2	0	1,060
2036	1,059	2	0	1,060
2037	1,059	2	0	1,060
2038	1,059	2	0	1,060
2039	1,059	2	0	1,060
2040	1,059	2	0	1,060
2041	1,059	2	0	1,060
2042	1,059	2	0	1,060
2043	1,059	2	0	1,060
2044	1,059	2	0	1,060
2045	1,059	2	0	1,060
2046	1,059	2	0	1,060
2047	1,059	2	0	1,060
2048	1,059	2	0	1,060
2049	1,059	2	0	1,060
2050	1,059	2	0	1,060
2051	0	0	0	0
2052	0	0	0	0
2053	0	0	0	0
2054	0	0	0	0
2055	0	0	0	0
2056	0	0	0	0
2057	0	0	0	0

2058	0	0	0	0
2059	0	0	0	0
2060	0	0	0	0
2061	0	0	0	0
2062	0	0	0	0
2063	0	0	0	0
2064	0	0	0	0
2065	0	0	0	0
2066	0	0	0	0
2067	0	0	0	0
2068	0	0	0	0
2069	0	0	0	0
2070	0	0	0	0
2071	0	0	0	0
2072	0	0	0	0
2073	0	0	0	0
2074	0	0	0	0
2075	0	0	0	0
2076	0	0	0	0
2077	0	0	0	0
2078	0	0	0	0
2079	0	0	0	0
2080	0	0	0	0
Total	**21,413**	**32**	**0**	**21,444**

B.1.2 Maximum Throughput

Note that the Maximum Throughput calculations based on the project at 90% IT equipment load at all times is implausible to occur in operation due to the variation in IT equipment utilisation that will occur in operation.

Scenario 1: Benchmark

Note that the following activity and emissions data is for a hypothetical reference to establish a Benchmark for comparison to the actual design performance and emissions. See Section 3.1.2 for further details of the scenario.

*Table 21: Scope 1 & 2 Emissions (t-CO_2-e) Breakdown Estimation – **Maximum** Throughput – **Benchmark Scenario 1***

Scenario	**Benchmark**			
Production	Diesel	Refrigerant	Non-IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate	484.51	30,840	1,502,764	
Units	kL/yr	kg	MWh/yr	
Source	Generators	Chillers	Grid	
Sector	Energy	IPPU	Energy	
Sub Sector	Buildings	ODP	Buildings	
Year	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	0	0	0	0
2027	0	0	0	0
2028	38	84	16,409	16,531

2029	241	495	66,329	67,065
2030	611	1,139	76,952	78,702
2031	883	1,503	90,943	93,329
2032	1,154	1,820	118,926	121,900
2033	1,305	1,996	119,530	122,831
2034	1,313	2,005	105,193	108,511
2035	1,313	2,005	105,193	108,511
2036	1,313	2,005	120,221	123,539
2037	1,313	2,005	120,221	123,539
2038	1,313	2,005	120,221	123,539
2039	1,313	2,005	120,221	123,539
2040	1,313	2,005	120,221	123,539
2041	1,313	2,005	120,221	123,539
2042	1,313	2,005	120,221	123,539
2043	1,313	2,005	120,221	123,539
2044	1,313	2,005	120,221	123,539
2045	1,313	2,005	120,221	123,539
2046	1,313	2,005	120,221	123,539
2047	1,313	2,005	120,221	123,539
2048	1,313	2,005	120,221	123,539
2049	1,313	2,005	120,221	123,539
2050	1,313	2,005	0	3,317
2051	1,313	2,005	0	3,317
2052	1,313	2,005	0	3,317
2053	1,313	2,005	0	3,317
2054	1,313	2,005	0	3,317
2055	1,313	2,005	0	3,317
2056	1,313	2,005	0	3,317
2057	1,313	2,005	0	3,317
2058	1,313	2,005	0	3,317
2059	1,313	2,005	0	3,317
2060	1,313	2,005	0	3,317
2061	1,313	2,005	0	3,317
2062	1,313	2,005	0	3,317
2063	1,313	2,005	0	3,317
2064	1,313	2,005	0	3,317
2065	1,313	2,005	0	3,317
2066	1,313	2,005	0	3,317
2067	1,313	2,005	0	3,317
2068	1,313	2,005	0	3,317
2069	1,313	2,005	0	3,317
2070	1,313	2,005	0	3,317
2071	1,313	2,005	0	3,317
2072	1,313	2,005	0	3,317
2073	1,313	2,005	0	3,317
2074	1,313	2,005	0	3,317
2075	1,313	2,005	0	3,317
2076	1,313	2,005	0	3,317

2077	1,313	2,005	0	3,317
2078	1,313	2,005	0	3,317
2079	1,313	2,005	0	3,317
2080	1,313	2,005	0	3,317
Total	**65,938**	**101,253**	**2,382,571**	**2,549,763**

Scenario 2: Design Measures

*Table 22: Scope 1 & 2 Emissions (t-CO_2-e) Breakdown Estimation – **Maximum** Throughput – **Design Measures Scenario 2***

Scenario	**Design Measures**			
Production	Diesel	Refrigerant	Non-IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate	390.73	30,840	680,881	
Units	kL/yr	kg	MWh/yr	
Source	Generators	Chillers	Grid	
Sector	Energy	IPPU	Energy	
Sub Sector	Buildings	ODP	Buildings	
Year	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	0	0	0	0
2027	0	0	0	0
2028	30	0	7,435	7,465
2029	195	0	30,053	30,248
2030	493	1	34,866	35,360
2031	712	1	41,205	41,918
2032	931	1	53,883	54,816
2033	1,053	2	54,157	55,212
2034	1,059	2	47,662	48,722
2035	1,059	2	47,662	48,722
2036	1,059	2	54,470	55,531
2037	1,059	2	54,470	55,531
2038	1,059	2	54,470	55,531
2039	1,059	2	54,470	55,531
2040	1,059	2	54,470	55,531
2041	1,059	2	54,470	55,531
2042	1,059	2	54,470	55,531
2043	1,059	2	54,470	55,531
2044	1,059	2	54,470	55,531
2045	1,059	2	54,470	55,531
2046	1,059	2	54,470	55,531
2047	1,059	2	54,470	55,531
2048	1,059	2	54,470	55,531
2049	1,059	2	54,470	55,531
2050	1,059	2	0	1,060
2051	1,059	2	0	1,060
2052	1,059	2	0	1,060
2053	1,059	2	0	1,060
2054	1,059	2	0	1,060
2055	1,059	2	0	1,060

2056	1,059	2	0	1,060
2057	1,059	2	0	1,060
2058	1,059	2	0	1,060
2059	1,059	2	0	1,060
2060	1,059	2	0	1,060
2061	1,059	2	0	1,060
2062	1,059	2	0	1,060
2063	1,059	2	0	1,060
2064	1,059	2	0	1,060
2065	1,059	2	0	1,060
2066	1,059	2	0	1,060
2067	1,059	2	0	1,060
2068	1,059	2	0	1,060
2069	1,059	2	0	1,060
2070	1,059	2	0	1,060
2071	1,059	2	0	1,060
2072	1,059	2	0	1,060
2073	1,059	2	0	1,060
2074	1,059	2	0	1,060
2075	1,059	2	0	1,060
2076	1,059	2	0	1,060
2077	1,059	2	0	1,060
2078	1,059	2	0	1,060
2079	1,059	2	0	1,060
2080	1,059	2	0	1,060
Total	**53,176**	**78**	**1,079,509**	**1,132,763**

Scenario 3: All Measures

*Table 23: Scope 1 & 2 Emissions (t-CO_2-e) Breakdown Estimation – **Maximum** Throughput – **All Measures Scenario 3***

Scenario	**All Measures**			
Production	Diesel	Refrigerant	Non-IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate	134.73	30,840	678,618	
Units	kL/yr	kg	MWh/yr	
Source	Generators	Chillers	Grid	
Sector	Energy	IPPU	Energy	
Sub Sector	Buildings	ODP	Buildings	
Year	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	0	0	0	0
2027	0	0	0	0
2028	30	0	0	30
2029	195	0	0	195
2030	493	1	0	494
2031	712	1	0	713
2032	931	1	0	932
2033	1,053	2	0	1,054
2034	1,059	2	0	1,060

2035	1,059	2	0	1,060
2036	1,059	2	0	1,060
2037	1,059	2	0	1,060
2038	1,059	2	0	1,060
2039	1,059	2	0	1,060
2040	1,059	2	0	1,060
2041	1,059	2	0	1,060
2042	1,059	2	0	1,060
2043	1,059	2	0	1,060
2044	1,059	2	0	1,060
2045	1,059	2	0	1,060
2046	1,059	2	0	1,060
2047	1,059	2	0	1,060
2048	1,059	2	0	1,060
2049	1,059	2	0	1,060
2050	1,059	2	0	1,060
2051	0	0	0	0
2052	0	0	0	0
2053	0	0	0	0
2054	0	0	0	0
2055	0	0	0	0
2056	0	0	0	0
2057	0	0	0	0
2058	0	0	0	0
2059	0	0	0	0
2060	0	0	0	0
2061	0	0	0	0
2062	0	0	0	0
2063	0	0	0	0
2064	0	0	0	0
2065	0	0	0	0
2066	0	0	0	0
2067	0	0	0	0
2068	0	0	0	0
2069	0	0	0	0
2070	0	0	0	0
2071	0	0	0	0
2072	0	0	0	0
2073	0	0	0	0
2074	0	0	0	0
2075	0	0	0	0
2076	0	0	0	0
2077	0	0	0	0
2078	0	0	0	0
2079	0	0	0	0
2080	0	0	0	0
Total	**21,413**	**32**	**0**	**21,444**

B.2 Scope 3 Emissions

B.2.1 Operational Throughput

Scenario 1: Benchmark

Note that the following activity and emissions data is for a hypothetical reference to establish a Benchmark for comparison to the actual design performance and emissions. See Section 3.1.2 for further details of the scenario.

*Table 24: Scope 1 & 2 Emissions ($t\text{-}CO_2\text{-}e$) Breakdown Estimation – **Operational** Throughput – **Benchmark Scenario 1***

Scenario	**Benchmark**				
Production	Diesel	Non-IT Electricity	IT Electricity	Materials & Construction	**Total Scope 3 ($t\text{-}CO_2\text{-}e$)**
Production Rate	484.51	1,252,303	2,286,360	N/A	
Units	kL/yr	MWh/yr	MWh/yr	N/A	
Source	Generators	Grid	Grid	Various	
Sector	Energy	Energy	Energy	Energy	
Sub Sector	Buildings	Buildings	Buildings	Manufacture & Construction	
Year	**Scope 3 ($t\text{-}CO_2\text{-}e$)**	**Scope 3 ($t\text{-}CO_2\text{-}e$)**	**Scope 3 ($t\text{-}CO_2\text{-}e$)**	**Scope 3 ($t\text{-}CO_2\text{-}e$)**	
2026	0	0	0	0	0
2027	0	0	0	9,336	9,336
2028	9	720	26,280	73,756	100,765
2029	60	2,303	105,120	157,781	265,264
2030	151	5,830	127,721	97,563	231,264
2031	218	0	138,364	0	138,582
2032	284	11,012	201,042	0	212,338
2033	322	12,451	204,590	0	217,363
2034	324	0	160,045	0	160,369
2035	324	12,523	182,909	0	195,755
2036	324	0	182,909	0	183,232
2037	324	0	182,909	0	183,232
2038	324	0	182,909	0	183,232
2039	324	0	182,909	0	183,232
2040	324	0	182,909	0	183,232
2041	324	0	182,909	0	183,232
2042	324	0	182,909	0	183,232
2043	324	0	182,909	0	183,232
2044	324	0	182,909	0	183,232
2045	324	0	182,909	0	183,232
2046	324	0	182,909	0	183,232
2047	324	0	182,909	0	183,232
2048	324	0	182,909	0	183,232
2049	324	0	182,909	0	183,232
2050	324	0	0	0	324
2051	324	0	0	0	324
2052	324	0	0	0	324
2053	324	0	0	0	324

2054	324	0	0	0	324
2055	324	0	0	0	324
2056	324	0	0	0	324
2057	324	0	0	0	324
2058	324	0	0	0	324
2059	324	0	0	0	324
2060	324	0	0	0	324
2061	324	0	0	0	324
2062	324	0	0	0	324
2063	324	0	0	0	324
2064	324	0	0	0	324
2065	324	0	0	0	324
2066	324	0	0	0	324
2067	324	0	0	0	324
2068	324	0	0	0	324
2069	324	0	0	0	324
2070	324	0	0	0	324
2071	324	0	0	0	324
2072	324	0	0	0	324
2073	324	0	0	0	324
2074	324	0	0	0	324
2075	324	0	0	0	324
2076	324	0	0	0	324
2077	324	0	0	0	324
2078	324	0	0	0	324
2079	324	0	0	0	324
2080	324	0	0	0	324
Total	**16,250**	**44,838**	**3,706,794**	**338,436**	**4,106,318**

Scenario 2 and 3: Design Measures and All Measures

*Table 25: Scope 3 Emissions (t-CO_2-e) Breakdown Estimation – **Operational** Throughput – **Scenario 2 and 3***

Scenario	**Design Measures and All Measures**				
Production	Diesel	Non-IT Electricity	IT Electricity	Materials & Construction	**Total Scope 3 (t-CO_2-e)**
Production Rate	390.73	567,400	2,286,360	N/A	
Units	kL/yr	MWh/yr	MWh/yr	N/A	
Source	Generators	Grid	Grid	Various	
Sector	Energy	Energy	Energy	Energy	
Sub Sector	Buildings	Buildings	Buildings	Manufacture & Construction	
Year	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	
2026	0	0	0	0	0
2027	0	0	0	9,336	9,336
2028	7	326	26,280	73,756	100,369
2029	48	1,043	105,120	157,781	263,993
2030	121	2,641	127,721	97,563	228,047

2031	175	0	138,364	0	138,540
2032	229	4,989	201,042	0	206,261
2033	259	5,641	204,590	0	210,491
2034	261	0	160,045	0	160,306
2035	261	5,674	182,909	0	188,844
2036	261	0	182,909	0	183,170
2037	261	0	182,909	0	183,170
2038	261	0	182,909	0	183,170
2039	261	0	182,909	0	183,170
2040	261	0	182,909	0	183,170
2041	261	0	182,909	0	183,170
2042	261	0	182,909	0	183,170
2043	261	0	182,909	0	183,170
2044	261	0	182,909	0	183,170
2045	261	0	182,909	0	183,170
2046	261	0	182,909	0	183,170
2047	261	0	182,909	0	183,170
2048	261	0	182,909	0	183,170
2049	261	0	182,909	0	183,170
2050	261	0	0	0	261
2051	261	0	0	0	261
2052	261	0	0	0	261
2053	261	0	0	0	261
2054	261	0	0	0	261
2055	261	0	0	0	261
2056	261	0	0	0	261
2057	261	0	0	0	261
2058	261	0	0	0	261
2059	261	0	0	0	261
2060	261	0	0	0	261
2061	261	0	0	0	261
2062	261	0	0	0	261
2063	261	0	0	0	261
2064	261	0	0	0	261
2065	261	0	0	0	261
2066	261	0	0	0	261
2067	261	0	0	0	261
2068	261	0	0	0	261
2069	261	0	0	0	261
2070	261	0	0	0	261
2071	261	0	0	0	261
2072	261	0	0	0	261
2073	261	0	0	0	261
2074	261	0	0	0	261
2075	261	0	0	0	261
2076	261	0	0	0	261
2077	261	0	0	0	261
2078	261	0	0	0	261

2079	261	0	0	0	261
2080	261	0	0	0	261
Total	**13,105**	**20,316**	**3,706,794**	**338,436**	**4,078,650**

B.2.2 Maximum Throughput

Note that the Maximum Throughput calculations based on the project at 90% IT equipment load at all times is implausible to occur in operation due to the variation in IT equipment utilisation that will occur in operation.

Scenario 1: Benchmark

Note that the following activity and emissions data is for a hypothetical reference to establish a Benchmark for comparison to the actual design performance and emissions. See Section 3.1.2 for further details of the scenario.

*Table 96: Scope 3 Emissions (t-CO_2-e) Breakdown Estimation – **Maximum** Throughput – **Benchmark Scenario 1***

Scenario	**Benchmark**				
Production	Diesel	Non-IT Electricity	IT Electricity	Materials & Construction	**Total Scope 3 (t-CO_2-e)**
Production Rate	484.51	1,502,764	2,743,632	N/A	
Units	kL/yr	MWh/yr	MWh/yr	N/A	
Source	Generators	Grid	Grid	Various	
Sector	Energy	Energy	Energy	Energy	
Sub Sector	Buildings	Buildings	Buildings	Manufacture & Construction	
Year	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	
2026	0	0	0	0	0
2027	0	0	0	9,336	9,336
2028	9	864	31,536	73,756	106,165
2029	60	2,764	126,144	157,781	286,748
2030	151	6,996	153,265	97,563	257,974
2031	218	0	166,037	0	166,255
2032	284	13,214	241,250	0	254,749
2033	322	14,941	245,508	0	260,771
2034	324	0	192,054	0	192,378
2035	324	15,028	219,491	0	234,842
2036	324	0	219,491	0	219,814
2037	324	0	219,491	0	219,814
2038	324	0	219,491	0	219,814
2039	324	0	219,491	0	219,814
2040	324	0	219,491	0	219,814
2041	324	0	219,491	0	219,814
2042	324	0	219,491	0	219,814
2043	324	0	219,491	0	219,814
2044	324	0	219,491	0	219,814
2045	324	0	219,491	0	219,814
2046	324	0	219,491	0	219,814
2047	324	0	219,491	0	219,814
2048	324	0	219,491	0	219,814

2049	324	0	219,491	0	219,814
2050	324	0	0	0	324
2051	324	0	0	0	324
2052	324	0	0	0	324
2053	324	0	0	0	324
2054	324	0	0	0	324
2055	324	0	0	0	324
2056	324	0	0	0	324
2057	324	0	0	0	324
2058	324	0	0	0	324
2059	324	0	0	0	324
2060	324	0	0	0	324
2061	324	0	0	0	324
2062	324	0	0	0	324
2063	324	0	0	0	324
2064	324	0	0	0	324
2065	324	0	0	0	324
2066	324	0	0	0	324
2067	324	0	0	0	324
2068	324	0	0	0	324
2069	324	0	0	0	324
2070	324	0	0	0	324
2071	324	0	0	0	324
2072	324	0	0	0	324
2073	324	0	0	0	324
2074	324	0	0	0	324
2075	324	0	0	0	324
2076	324	0	0	0	324
2077	324	0	0	0	324
2078	324	0	0	0	324
2079	324	0	0	0	324
2080	324	0	0	0	324
Total	**16,250**	**53,806**	**4,448,153**	**338,436**	**4,856,644**

Scenario 2 and 3: Design Measures and All Measures

*Table 27: Scope 3 Emissions (t-CO_2-e) Breakdown Estimation – **Maximum** Throughput – **Scenario 2 and 3***

Scenario	**Design Measures and All Measures**				
Production	Diesel	Non-IT Electricity	IT Electricity	Materials & Construction	**Total Scope 3 (t-CO_2-e)**
Production Rate	390.73	680,881	2,743,632	N/A	
Units	kL/yr	MWh/yr	MWh/yr	N/A	
Source	Generators	Grid	Grid	Various	
Sector	Energy	Energy	Energy	Energy	
Sub Sector	Buildings	Buildings	Buildings	Manufacture & Construction	
Year	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	

2026	0	0	0	0	0
2027	0	0	0	9,336	9,336
2028	7	391	31,536	73,756	105,691
2029	48	1,252	126,144	157,781	285,225
2030	121	3,170	153,265	97,563	254,119
2031	175	0	166,037	0	166,212
2032	229	5,987	241,250	0	247,467
2033	259	6,770	245,508	0	252,537
2034	261	0	192,054	0	192,315
2035	261	6,809	219,491	0	226,560
2036	261	0	219,491	0	219,751
2037	261	0	219,491	0	219,751
2038	261	0	219,491	0	219,751
2039	261	0	219,491	0	219,751
2040	261	0	219,491	0	219,751
2041	261	0	219,491	0	219,751
2042	261	0	219,491	0	219,751
2043	261	0	219,491	0	219,751
2044	261	0	219,491	0	219,751
2045	261	0	219,491	0	219,751
2046	261	0	219,491	0	219,751
2047	261	0	219,491	0	219,751
2048	261	0	219,491	0	219,751
2049	261	0	219,491	0	219,751
2050	261	0	0	0	261
2051	261	0	0	0	261
2052	261	0	0	0	261
2053	261	0	0	0	261
2054	261	0	0	0	261
2055	261	0	0	0	261
2056	261	0	0	0	261
2057	261	0	0	0	261
2058	261	0	0	0	261
2059	261	0	0	0	261
2060	261	0	0	0	261
2061	261	0	0	0	261
2062	261	0	0	0	261
2063	261	0	0	0	261
2064	261	0	0	0	261
2065	261	0	0	0	261
2066	261	0	0	0	261
2067	261	0	0	0	261
2068	261	0	0	0	261
2069	261	0	0	0	261
2070	261	0	0	0	261
2071	261	0	0	0	261
2072	261	0	0	0	261
2073	261	0	0	0	261

2074	261	0	0	0	261
2075	261	0	0	0	261
2076	261	0	0	0	261
2077	261	0	0	0	261
2078	261	0	0	0	261
2079	261	0	0	0	261
2080	261	0	0	0	261
Total	**13,105**	**24,379**	**4,448,153**	**338,436**	**4,824,072**

Appendix C Independent Expert Review

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23 March 2026

SUBJECT: INDEPENDENT REVIEWER'S REPORT FOR A DATA CENTRE IN ACCORDANCE WITH THE NSW EPA'S GUIDE FOR LARGE EMITTERS

Dear Vishaal,

Zephyr Environmental Pty Ltd (Zephyr) has been engaged by LCI Consultants (LCI), on behalf of Goodman Property Services (Aust) Pty Ltd (Goodman Property Services) to perform an independent review of the Greenhouse Gas (GHG) Assessment Report prepared for the proposed data centre facility and associated Offsite Enabling Infrastructure (OEI) at 10 Roberts Road, Eastern Creek (Revision A, LCI Consultants. 20 February 2026; "the GHG Assessment Report"). The development is also known under the title "Project Atlas".

Zephyr understands that the GHG Assessment Report was prepared as the proposed development is anticipated to exceed the thresholds for large emitter classification; namely that the Scope 1 & 2 emissions exceed 25,000 tCO_2-e per year, per the NSW Guide for Large Emitters (NSW EPA, January 2025).

The Assessment Report has been prepared by LCI on behalf of Goodman Property Services to accompany a State Significant Development Application (SSDA) for the proposed data centre. The project site is in the Blacktown Local Government Area (LGA), and is approximately 35km from the Sydney Central Business District (CBD) and 5.1km from Rooty Hill Train Station. The site area has approximately 17 hectares and the data centre site has an area of approximately 168,574m^2.

This letter serves as the formal submission of the independent expert reviewer's report, conducted in accordance with Section 4.7 of the NSW Guide for Large Emitters.

1. INDEPENDENT EXPERT REVIEWER

In accordance with Section 4.7 of the NSW Guide for Large Emitters the GHG Assessment Report and Mitigation Plan are subject to an independent expert review from an independent and suitably qualified expert reviewer.

I confirm that I am a Category 2 (Lead) Auditor under the National Greenhouse and Energy Reporting (NGER) scheme, and I have attached my CV to Appendix A. This provides evidence of my qualifications and experience that are relevant to this review.

As a Category 2 registered greenhouse and energy auditor, my role is to evaluate compliance of the schemes administered by the Clean Energy Regulator (CER). This has provided me exposure to both the market demand for offsets (NGER and Safeguard Mechanism) and supply (ACCU scheme) and thus requires me to understand Australian carbon market dynamics.

No actual or perceived conflicts of interest have come to my attention, and I have not been employed by the proponent within the last five years.

2. SCOPE OF REVIEW

For projects with scope 1 and 2 emissions exceeding 100,000 tCO_2-e per year at any time over the operational life of the project, mitigation assessments must be verified by an independent expert review.

If offsets are proposed for a project, the independent expert review must consider whether suitable high-integrity offsets are likely to be available at the time when it is proposed to acquire offsets.

Thus, in accordance with Section 4.7 of the NSW Guide for Large Emitters, the independent expert review focuses upon:

- The mitigation assessment
- The offsets strategy.

3. EMISSIONS OVERVIEW

The proposed Project Atlas development is expected to emit over 25,000 tonnes of scope 1 and 2 of CO_2-e emissions in any financial year of the project's operations. Therefore, this project meets the criteria of a large emitter and is required by the NSW Guide for Large Emitters to prepare an emissions mitigation strategy.

In the GHG Assessment Report, LCI has examined Project Atlas regarding its assessment boundary and scenarios, emissions sources and scopes, emissions mitigation measures, project assumptions, and reporting obligations and goals.

Project activities are expected to consist of site preparation (including bulk excavations, removal of existing structures, vegetation clearing and bulk earthworks) and construction, fit-out and 24/7 operation of a Data Centre consisting of two main buildings. Construction of offsite enabling infrastructure, office and amenity are also associated with the project. Provision of required utilities falls under the scope of the Proponent and includes diesel storage tanks, water tanks, substations on site, vehicle access for 20m articulated vehicles, associated landscaping, and installation of site service and drainage infrastructure. The site will consist of 249 backup generators powered by diesel (three generators with 1,000 kWe (ESP) and 246 generators with 2,800 kWe (ESP) outputs).

As a result of activities carried out at the Project Atlas Data Centre, associated emissions would originate from the following sources:

- Diesel oil for generators (Scope 1 & 3)
- Refrigerants for industrial processes (Scope 1)
- Non-IT electricity (Scope 2 & 3)
- IT electricity (Scope 3)
- Materials and construction (Scope 3)
- Water Treatment and Distribution (Scope 3)

The GHG Assessment Report has considered the following three emissions scenarios:

- Scenario 1 – Benchmark: Performance benchmark equivalent to a Power Usage Effectiveness (PUE) of 1.55, which is the national average for data centres.
- Scenario 2 – Design Measures: Includes the targeted project design features that support the annual target PUE of 1.25.
- Scenario 3 – All Measures: Per Scenario 2, plus the procurement of 100% renewable electricity for all non-IT equipment under the proponent's scope.

4. FINDINGS AND RECOMMENDATIONS

3.1 Mitigation assessment

The mitigation strategy for Project Atlas targets the emissions sources summarised in Section 3 by following the NSW EPA mitigation hierarchy. This figure depicting the mitigation hierarchy is referenced as Figure 2 within the GHG Assessment Report and is reproduced as Figure 1 within this document.

Consistent with the hierarchy, avoidance and reduction measures for Project Atlas are considered first, followed by substitution and offsetting.

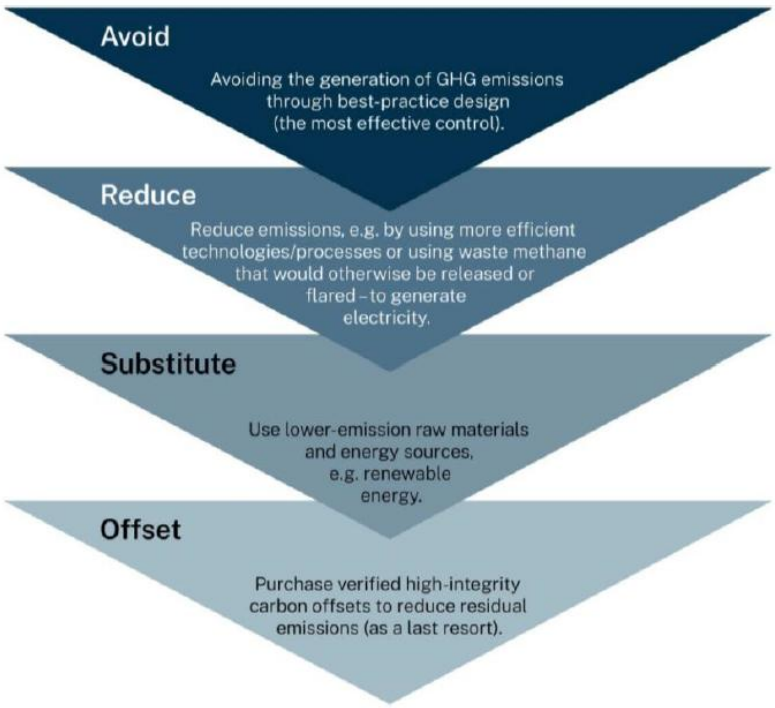

Figure 2: GHG Emissions Mitigation Hierarchy (source: NSW Guide for Large Emitters)

Figure 1: Greenhouse gas emissions mitigation hierarchy (Source NSW Guide for Large Emitters, reproduced as "Figure 2" within the GHG Assessment Report)

Avoid and Reduce

Emissions are planned to be avoided and reduced by implementing "best-practice" design features to reach a PUE target of 1.25. The avoidance and reduction measures stated in the GHG Assessment include:

- Elevated setpoint temperature for data hall cooling and relaxed humidity setpoint in combination with direct to chip liquid cooling.
- Bypassing chiller operations in ambient conditions through waterside economy cycle / free cooling from hybrid dry coolers.

- High efficiency chiller plant through modern compressor technology and elevated temperature for operational chilled water accomplished through direct to chip liquid cooling and relaxed data hall conditions.
- On-site PV maximised to available roof-space, with a minimum 1,200 kWe output capacity.
- Low absorptivity / high Solar Reflective Index (SRI) external finishes for buildings to reduce radiant heat gains.
- High performance fabric / glazing and glazing shading to office spaces.
- 4th Generation refrigerants for chiller plant, which have a low global warming potential (GWP) of 1 compared to previous generation refrigerants.

The above measures are to be implemented as the measures for 'Scenario 2 – Design Measures'. The avoidance and reduction strategies set out in the GHG Assessment Report are expected to improve energy optimisation and reduce the demand for grid electricity by the facility. The consideration of a wide range of technologies, materials, and equipment demonstrate that a reasonable evaluation of avoidance and reduction opportunities have been explored.

Substitute and Offset

'Scenario 3 – All Measures' considers Scenario 2 (avoidance and reduction) in combination with substitution and offsetting plans. The substitution and offsetting measures stated in the GHG Assessment Report include:

- Procuring 100% renewable energy for all non-IT electricity consumption from the start of the site's operation (e.g. Power Purchase Agreement (PPA) for accredited GreenPower).
- Aligning with net-zero carbon initiatives in concert with the NSW Government's target through consideration of the following:
  - Renewable bio-fuel for backup generators subject to suitability to equipment and the availability of a viable source.
  - Purchase of offsets for residual diesel fuel and refrigerant emissions.
- Work with tenants to minimise or eliminate emissions associated with their electricity use.

The GHG Assessment Report states that Scope 2 emissions due to the electricity consumption of Tenant IT Equipment within the data halls will be the responsibility of the tenant and out of the control of the proponent. However, it is stated that the proponent intends to "work with the prospective Tenant(s) to minimise or eliminate the GHG emissions associated with their electricity use. Section 3.5.3 of the GHG Assessment Report states that it is common in the industry for data centre tenants to procure renewable energy, particularly for hyperscale customers that have a public commitment to procure renewable electricity.

Offsets are considered for all residual emissions that are not eliminated by other proposed mitigation techniques. The feasibility of Project Atlas' offset strategy is explored in Section 3.2.

It is concluded that the GHG Assessment Report has considered relevant and feasible mitigation measures that target emissions common for data centres. The GHG Assessment does not, however,

explicitly state the consideration of emerging technologies that may also contribute to future mitigation measures.

Recommendation 1: LCI should include a statement within the GHG Assessment Mitigation Strategy (Section 3.3) that ensures the proponent will consider emerging emissions mitigation technologies where appropriate and feasible throughout the project lifespan.

Upon the consideration of the recommendations made in this review, the mitigation strategy laid out for the proposed development is considered adequate.

3.2 Offsets Strategy

In accordance with the NSW EPA mitigation hierarchy (Figure 1), the GHG Assessment Report has developed an offsets strategy for mitigating residual emissions that cannot be avoided, reduced, or substituted. Residual emissions are expected to result from diesel fuel emissions from emergency generators, and refrigerant emissions from industrial processes.

As stated within the Guide for Large Emitters, the NSW EPA prefers that offsets be generated in NSW and will not accept international offsets as an appropriate mitigation strategy.

At present, the GHG Assessment Report does not specify the timing, or location(s) and type(s) of offsets the proponent plans to obtain.

Recommendation 2: To strengthen the claim to purchase offsets for residual emissions, it is recommended to specify the preferred location and type of offsets the proponent intends to acquire. It is also recommended to consider NSW-based offsets, where they are available and cost-effective, as preferred by the NSW EPA.

Australian Carbon Credit Units (ACCUs) are referenced in the NSW Guide for Large Emitters (2025) as an example of appropriate offsets, and are anticipated to be a default offset product applicable to the project.

The Clean Energy Regulator (CER) provides detailed data on ACCU issuance, cancellations, and project registrations. Their Quarterly Carbon Market Reports provide a comprehensive analysis of market trends, including information on both offsets supply and demand.

Evaluation of these data indicates that ACCU issuance has grown steadily since the scheme's inception in 2011. In recent years, total annual ACCU issuances were recorded as being between 18-19 million.

An evaluation of the ACCU market supports that changes in government policy, particularly the reforms to the Safeguard Mechanism, have a significant impact on demand and, consequently, supply (via new project registration and ACCU generation).

Both the CER and market analysts (e.g. the Carbon Market Institute) project continued growth in ACCU generation. Forecasts suggest issuance could rise to 31 million in 2033, driven by a growing demand for offsets from the Safeguard Mechanism and voluntary markets.

In line with the 2050 net zero target by the NSW Government, the GHG Assessment Report states that the proponent commits to net zero emissions from 2050 onwards. This commitment is based on the expectation that any emissions not avoided, reduced, or substituted are offset.

The emissions for a “maximum throughput” scenario are stated to occur when the project always sees a 90% IT equipment load. The GHG Assessment Report states that a maximum throughput scenario

is highly unlikely and provides an “operational throughput” scenario where the project sees an annual average equipment loading of 75%.

In the operational throughput scenario with ‘Scenario 3 – All Measures” in place, average annual emissions over the lifespan of the project are expected to be 390 tCO_2-e. Scenario 3, however, is defined as including all mitigation measures (avoid, reduce, substitute, and offset). Therefore, Scenario 3 does not provide an accurate prediction of offsets needed for residual emissions as it already considers the use of offsets.

“Scenario 2 – Design Measures’, considers the avoidance and reduction methods for emissions mitigation without considering substitution and offsets. As the GHG Assessment Report does not directly project the residual emissions needing offsets, Scenario 2 can provide a better understanding of the projected residual emissions. Table 10 of the GHG Assessment maps out the total Scope 1 and 2 emissions estimations for operational throughput under Scenario 2. This results in a total of 952,844 tCO_2-e from 2028 to 2080, which is an approximate annual average of 17,978.20 tCO_2-e between 2028 and 2080.

Given the quantum of offsets required, and total anticipated annual ACCU issuance into the future, it is considered that there will be sufficient availability of high-integrity offsets in any one year of operations.

It is also noted that ACCUs may be surrendered from multiple vintages (years of issuance).

The GHG Assessment for the Project Atlas Data Centre presents a review of expected emissions sources and mitigation measures. The classification of residual emissions intended to be mitigated through the offset strategy is justifiable.

5. CONCLUSIONS

This independent expert review has assessed the GHG Assessment Report provided by LCI Consultants for the proposed Project Atlas Data Centre, in accordance with Section 4.7 of the NSW Guide for Large Emitters, the independent expert review focuses upon the proposal’s mitigation assessment and offsets strategy.

The review determined that GHG Assessment Report is compliant with the NSW EPA’s Guide for Large Emitters. It is recommended that Goodman Property Services considers the specific recommendations to further enhance its reporting practices and compliance with the Guide.

Yours sincerely,

Damon Roddis

Category 1 and Category 2 Auditor (RGEA 0155/2012)
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Appendix A – Damon Roddis CV

Damon Roddis

Principal – Greenhouse Gas

Damon has extensive experience in the field of environmental science, specialising in greenhouse gas (GHG) quantification and management. He has over two decades experience in delivering GHG assessments and reasonable assurance auditing of GHG statements.

Damon acts as lead auditor under the (former) NSW Greenhouse Gas Abatement Scheme (GGAS) and (current) Energy Savers Scheme (ESS), and has conducted NSW Greenhouse Abatement Certificate (NGAC) and Energy Saving Certificate (ESC) creation audits for a variety of abatement activities. These have included waste mine gas power generation (Envirogen), coal fired power station optimisation (Tarong Energy, Stanwell Power), and audit of commercial lighting energy savings claims.

Damon is a Category 1 (Technical) and Category 2 (Lead) auditor under the National Greenhouse and Energy Reporting (NGER) Scheme (Registered Greenhouse and Energy Auditor (RGEA) Registration Number: 0155/2012). Through this process, he has completed multiple complex assurance engagement on behalf of Shell Prelude FLNG, Delta Electricity, Shell QGC, as well as Envirogen waste mine gas electricity generation and Wollongong Coal underground coal mine activities.

His RGEA work has included multiple audits in relation to projects that generate Australian Carbon Credit Units (ACCUs) pursuant to the Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth) (CFI Act) including the Savannah Fire Management (SFM), Domestic, Commercial and Industrial Wastewater and Industrial and Commercial Emissions Reduction (ICER) methodologies.

He has completed both physical and transitional GHG risk assessments for several clients, including Sydney Metro and is familiar with the obligations under the Taskforce for Climate-related Financial Disclosure (TCFD).

He provides GHG advisory services to multiple industry sectors, including the energy-from-waste, mining, transport and waste sectors. This has included quantification of GHG savings associated with the use of alternative materials and fuels.

He has conducted GHG / energy savings audits on behalf of an international manufacturing client in Australia, Thailand, China and the Philippines.

Experience: 25+ years of experience in GHG assessment and carbon management. 10+ years of experience in GHG audit and assurance.

LinkedIn: https://www.linkedin.com/in/damon-roddis/

Professional Affiliations & Registrations: Certified Air Quality Professional (CAQP), Certified Environmental Practitioner (CEnvP)

Education: Bachelor of Science (Hons) – Environmental Science

Email: damon.roddis@zephyrenviro.com

Key Experience

Emission Reduction Fund Audits under the Australian Carbon Credit Units Scheme Multiple audits completed for Australian Carbon Credit Unit (ACCU) Scheme (formerly known as the Emissions Reduction Fund) projects. Subsequent audits pursuant to sections 13 and 76 of the Carbon Credits (Carbon Farming Initiative) Act 2011 (CFI Act). Multiple audits of Savannah Fire Management (SFM) method projects including Conways, Holroyd, Strathburn and Watsons River stations. Audits under the Domestic, Commercial and Industrial Wastewater and Industrial and Commercial Emissions Reduction (ICER) methodologies.

Programmatic Greenhouse Gas Auditing on behalf of Shell Australia Multi-year greenhouse gas and energy audits covering all Shell's entities in Australia. Delivery of audits under the Australian National Greenhouse and Energy Reporting (NGER) Scheme, along with assurance to ISO14064 () for both methane and greenhouse gas generation. Audit scopes covering Shell QGC's upstream facilities (coal seam gas wells, central processing facilities, Condamine Power Station) and midstream (Curtis Island LNG facility). Western Australia assets covering the Prelude floating LNG facility and Darwin supply base.

Greenhouse Gas Audits under the (Australian) National Greenhouse and Energy Reporting (NGER) Scheme Accredited auditor under the Australian NGER Scheme. Multiple audits of major greenhouse gas emitters across Australia including black coal power generation (Delta Electricity), underground coal mining (Wollongong Coal) and Coal Seam / Landfill Gas production / distribution infrastructure and power generation.

Reasonable assurance audits to ISAE 3000 for the NSW Energy Savings Scheme, including more than sixty audit and assurance engagements completed since 2015. Audit of the Energy Savings Certificates generated by Accredited Certificate Providers, submitted to the scheme administrator, IPART.

Energy Savings audits completed as part of an international program of works on behalf of a multinational manufacturing client in Australia, Thailand, China and the Philippines.

Auditor under the NSW Greenhouse Gas Abatement Scheme (GGAS) Lead auditor under the (now historical) GGAS scheme including audit and assurance over multiple sectors including coal-fired power generation and waste mine / landfill gas power generation.

Reasonable assurance audit under the National Greenhouse and Energy Reporting Act 2007 for Hydro Tasmania. Completion of NGER audit (voluntary) services of Hydro Tasmania's energy and emissions report for multiple hydropower stations, pump stations, and facilities in accordance with section 19 of NGER Act for FY23.

Comparative Product GHG Emissions Assessment. Quantification of the carbon abatement from the use of; crumb rubber use in road construction, tyre derived fuel as a coal replacement, and reused / recycled materials as a replacement for new quarried materials. The change in GHG emissions attributable to the products in each case was expressed as the difference in the GHG emissions associated with using 1 tonne of the product in the nominated end use, compared with using an equivalent amount of the conventional product.

GHG quantification – Mt Piper Energy Recovery Project Completion of the GHG assessment for a State significant 'Energy from Waste' facility. The project, once approved, will be one of the first large scale energy from waste projects in NSW. Extensive characterisation of the Resource Derived Fuel (RDF) in terms of composition and calorific content. These inputs were used to quantifying the greenhouse gas abatement associated with both diversion from landfill and black coal substitution during combustion.

Articulation of GHG benefits – The Next Generation Energy from Waste Project A significant environmental benefit associated with energy from waste projects resides in the greenhouse gas abatement that they offer. This is both in terms of landfill diversion and fuel substitution during electricity generation. The subject project has received a high degree of stakeholder scrutiny. This has meant that the GHG benefits needed to be clearly and accurately stated, and extremely robust.

GHG Risk Assessment Workshop – Sydney Metro Completion of physical / transitional risk assessment workshop to capture GHG risks and appropriate mitigation activities.

Greenhouse abatement calculations – Sydney Metro West Quantification of robust greenhouse gas calculations to provide meaningful mitigation / abatement options for this major infrastructure project.

252 MW Newcastle Gas-Fired Power Station GHG Assessment Quantitative GHG assessment for gas/distillate power station proposed at Tomago near to AGL's Newcastle Gas Storage Facility. Iterations of plant design required evaluation of both gas turbine and reciprocating gas engine plant options.

Jawa 1 CCGT Greenhouse Gas Assessment Quantitative GHG assessment for proposed combined cycle gas turbine, floating storage regasification unit (FSRU) and onshore receival facility (ORF). Proposed project anticipated to contribute up to 3% of Indonesia's current anthropogenic greenhouse gas emissions.

Delta Electricity GHG audits S74AA Reasonable Assurance audit completed under the National Greenhouse and Energy Reporting Scheme. Audit completed under ASAE 3410 / 3100 to confirm the accuracy of GHG emission estimation from three coal fired power stations; Wallerawang (1,000 MW), Mt Piper (1,400 MW) and Vales Point (1,320 MW) for two consecutive years.

Van Phong Coal Fired Power Station, Vietnam Technical reviewer of Annexures within the Environmental Assessment documentation related to GHG for a proposed super-critical coal fired power station project to meet International Finance Corporation (IFC) standards for technical assessment.

Western Sydney Airport Technical GHG assessment across all emission scopes for the proposed second airport for Sydney located at Badgery's Creek, NSW.

GHG Assessments for Modification of to the Gloucester Gas Project Commissioned to prepare a GHG assessment for proposed modifications to the Gloucester Gas Project development consent. This required re-evaluation of four components: gas field development area, pipeline, central processing facility (CPF) and the Tomago Receiving Station.

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