GHG Assessment Report

250574 78 LOCKWOOD RD DATA CENTRE

Client:
Stack

Revision:
F

Date:
24/03/2026

REPORT INFORMATION

Project	78 Lockwood Rd Data Centre
Title	GHG Assessment Report
Client	Stack
Revision	F
Revision Date	24/03/2026
Prepared By	LCI Consultants Sydney Office Level 8, 73 Miller Street North Sydney, NSW 2060
ABN / ACN	92 124 107 973 / 124 107 973
Author	Tim Dunn

REVISION SCHEDULE

Revision	Date	Issue Name	Author	Authorised
A	07/08/2025	Draft	TD	VD
B	11/08/2025	Final	TD	VD
C	01/09/2025	Revised Final	TD	VD
D	02/10/2025	Issued for TOA	TD	VD
E	29/10/2025	IER and TOA Update	TD	VD
F	24/03/2026	Revised for RTS Submission	TD	PP

CONTENTS

Executive Summary

This report presents a Greenhouse Gas (GHG) Emissions Assessment prepared in accordance with the NSW Guide for Large Emitters to accompany the SSDA submission for the proposed data centre development at 78 Lockwood Road, Erskine Park. 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 T-CO_2-e per year, per the NSW Guide for Large Emitters.

Following exhibition of the SSDA, the project has been refined in response to submissions from the authorities and ongoing design development that has necessitated an update to the GHG Assessment Report. Generally, report updates provide additional detail of inputs, assumptions and calculation parameters as per the NSW Guide for Large Emitters, and account for the impact to IT load electricity use emissions due to the proponent's Hyperscale customer commitments to procuring 100% renewable electricity. In summary, the report updates include:

- Section 1 – Updated Project Description.
- Section 1.3 – Further detail added regarding the assumed spread of emissions due to the project stages.
- Section 2 –Legislative and Policy Context section added.
- Section 3.1 – Further justification provided for scope 3 emissions sources not included in the Assessment Boundary with some additional estimates (Appendix C) to support the exclusions.
- Section 3.2.1 – Update to the backup generator diesel consumption estimates to reflect design changes with further supporting inputs and parameters to support estimates calculations.
- Section 3.2.2 – Additional details provided of inputs and assumptions for calculating operational electricity consumption across the scenarios. Estimates updated to reflect revised PUE annual average target of 1.3.
- Section 3.2.3 – Further details added on scope 3 emissions sources not included in the assessment.
- Section 3.3 – Added description of the proponent's Hyperscale customers being committed to procuring 100% renewable electricity for IT loads as a pursued initiative of the design for assessed scenarios 2 and 3.
- Section 3.4.1 – General Methodologies section added to describe the methods used for estimating activity rates and GHG emissions according to the emissions source.
- Section 3.5 – Emissions factors utilised for the assessment updated to current 2025 values.
- Section 3.5.1 – Updated scope 1 & 2 emissions estimates to reflect design changes and revised targets, emissions factors & commitments.
- Section 3.5.2 – Updated scope 3 emissions estimates to reflect design changes and revised emissions factors.
- Section 3.5.3 – Additional table of lifetime emissions estimates broken down per source added plus results in overall emissions tables per scope revised. Further discussion added to explain the difference between the benchmark and design scenarios.
- Section 4.2 – Added description to the emissions goals regarding the proponent's Hyperscale customers being committed to procuring 100% renewable electricity for IT loads.
- Section 4.3 – Moved emissions trajectory plots to this new added section and added a cumulative plot.
- Section 4.1.3 – Adjustment to the reported emissions considering the proponent's Hyperscale customers are committed to procuring 100% renewable electricity for IT loads.
- Executive Summary & Conclusion – Updated to reflect revised estimated performance outcomes.
- Appendix B – Detailed emissions and activity data updated for all scenario estimations to reflect design changes, and revised targets, emissions factors & commitments. Additional detail added regarding inputs and assumptions utilised for the estimates with cross references to other report data in making the estimates.

The 78 Lockwood Road project comprises the construction of a data centre development including the following key components:

- Site preparation and bulk earthworks.
- Temporary construction access from Lenore Drive.
- Construction of a three-storey data centre comprising two buildings, with a maximum height of 26.5 metres and a total gross floor area (GFA) of approximately 56,506m^2, including technical data halls, office and administrative areas, and ancillary circulation space.
- At grade under-croft car parking (34 spaces) within the building footprint, plus an additional 44 on-site spaces, providing a total of 78 parking spaces.
- Separate generator gantry accommodating 188 backup generators.
- Landscaping and associated public domain works.
- Extension and augmentation of physical infrastructure and utilities as required, including an on-site substation and water storage tanks integrated within the building footprints.
- Off-site works comprising the delivery of two 330kV transmission lines from the TransGrid Sydney West Substation site to the subject site, utilising existing road reserve along Lenore Drive.

The proposed project will be delivered in two major stages for the two buildings construction estimated to commence around June 2026 and complete around January 2029. Operation is estimated to commence from September 2028 with a ramp of IT functional capacity as customer internal buildout occurs. The overall operational design life is 50 years.

The GHG assessment considered an assessment boundary including the construction and operational phases as the major contributors to project emissions but omitting the end-of-life phases with negligible emissions. The emissions sources considered includes diesel use, refrigerants, electricity use and construction & material use with the key emissions source being electricity use if unmitigated.

Emissions for the identified project sources were estimated across the following three comparative scenarios. Note that Scenario 3 are the overall project commitments. Scenario 2 only provides outcomes prior to offset pursuits.

- **Scenario 1: Benchmark –** Reference performance benchmark equivalent to the national average data centre performance of an approximate PUE of 1.6 that exceeds the minimum 3 Star NABERS Energy for Data Centres Infrastructure minimum per the project SEARs requirements.
- **Scenario 2: Design Measures –** Includes the targeted project design features that minimise demand and maximise efficiency in support of the target annual PUE of 1.3 and considers the proponent's Hyperscale customers that are committed to procuring 100% renewable electricity for IT loads, i.e. zero scope 2 emissions for IT load electricity.
- **Scenario 3: All Measures –** Per scenario 2 plus all non-IT equipment electricity procured is 100% renewable electricity from day 1 operation and net-zero emissions (scope 1 & 2) for all non-IT equipment is supported by 2050, per the proponent commitments and emissions goals.

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 NSW Guide for Large Emitters.

The following tables provides a summary of the Scope 1, 2 and 3 emissions estimates for the assessed scenarios.

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

Emissions Scope	Operational Throughput Lifetime GHG Emissions (t-CO_2-e)				
	Scenario 1 Benchmark	*Scenario 2 Design Measures*	*% Difference to Benchmark*	*Scenario 3 All Measures*	*% Difference to Benchmark*
Scope 1 Subtotal	*889,272*	*25,132*	*-97.2%*	*9,967*	*-98.9%*
Scope 2 Subtotal	*5,092,288*	*952,702*	*-81.3%*	*0*	*-100.0%*
Total Scope 1 & 2	**5,981,561**	**977,834**	***-83.7%***	**9,967**	***-99.8%***
Average Annual 1 & 2	110,770	18,108		185	
Scope 3 Subtotal	226,493	200,825	*-11.3%*	200,825	*-11.3%*
Total Scope 1, 2 & 3	**6,208,053**	**1,178,659**	***-81.0%***	**210,792**	***-96.6%***
Average Annual 1, 2 & 3	114,964	21,827		3,904	

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

Emissions Scope	Maximum Throughput Lifetime GHG Emissions (t-CO_2-e)				
	Scenario 1 Benchmark	*Scenario 2 Design Measures*	*% Difference to Benchmark*	*Scenario 3 All Measures*	*% Difference to Benchmark*
Scope 1 Subtotal	*889,272*	*25,132*	*-97.2%*	*9,967*	*-98.9%*
Scope 2 Subtotal	*8,489,498*	*1,589,679*	*-81.3%*	*0*	*-100.0%*
Total Scope 1 & 2	**9,378,770**	**1,614,810**	***-82.8%***	**9,967**	***-99.9%***
Average Annual 1 & 2	173,681	29,904		185	
Scope 3 Subtotal	312,876	271,012	*-13.4%*	271,012	*-13.4%*
Total Scope 1, 2 & 3	**9,691,646**	**1,885,822**	***-80.5%***	**280,979**	***-97.1%***
Average Annual 1, 2 & 3	179,475	34,923		5,203	

The key mitigation measures in support of the results outcomes above are:

Scenario 2 Design Measures

- Commitment for the design to support a target PUE of 1.3 minimising non-IT infrastructure electrical loads and associated scope 2 emissions.
- 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, significantly reducing scope 1 emissions.
- Hyperscale customers that are committed to procuring 100% renewable electricity for IT loads, i.e. zero scope 2 emissions for IT load electricity.

Scenario 3 All Measures

- Commitment to procure 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

Pursued mitigations of Scenario 2 Design Measures, the estimated annual Scope 1 & 2 emissions, for both the Operational & Maximum Throughput, are over 80% reduced compared to the Benchmark approximate national average performance. This demonstrates the Proponent's design commitments minimise energy demand that in combination with the Hyperscale customer commitments significantly reduces associated emissions.

When all the Proponent's commitments and emissions goals are considered per Scenario 3 All Measures the Scope 1 & 2 emissions are almost entirely eliminated with no less than an estimated 99.8% reduction, for both the Operational & Maximum Throughput, compared to the Benchmark. The annual average emissions over the project life are estimated at 185 t-CO_2-e/yr and well below the NSW Guide for Large Emitters threshold of 25,000 t-CO_2-e/yr.

The proponent's emissions goals include a Climate Pledge of reaching net-zero carbon (scope 1 and 2) emissions across all assets by the year 2050 and entails the following key project commitments:

- Hyperscale customers are committed to procuring 100% renewable electricity for IT loads eliminating the associated indirect scope 2 emissions from the start of operation (i.e. day 1).
- Minimise project energy needs through design initiatives considered best practice that reduce energy demand and maximise energy efficiency limiting scope 1 & 2 emissions (Scenario 2 Design Measures);
- Eliminate indirect scope 2 emissions for all non-IT electricity uses of the project by procuring 100% renewable sourced energy from the start of operation (i.e. day 1) (Scenario 3 All Measures); and
- Sustain net-zero carbon emissions across scope 1 & 2 from the year 2050 and throughout the project's life through considering the following to eliminate the remaining scope 1 emissions (Scenario 3 All Measures):
    - Utilisation of renewable bio-diesel for backup generators subject to availability of a viable source and suitability of operation in selected equipment, and/or
    - Purchase of offsets for diesel fuel emissions and refrigerant emissions.

The following figure provides the estimated emissions trajectory over the life of the project taking into account the Proponent's emissions goals aligned to the assessment Scenarios.

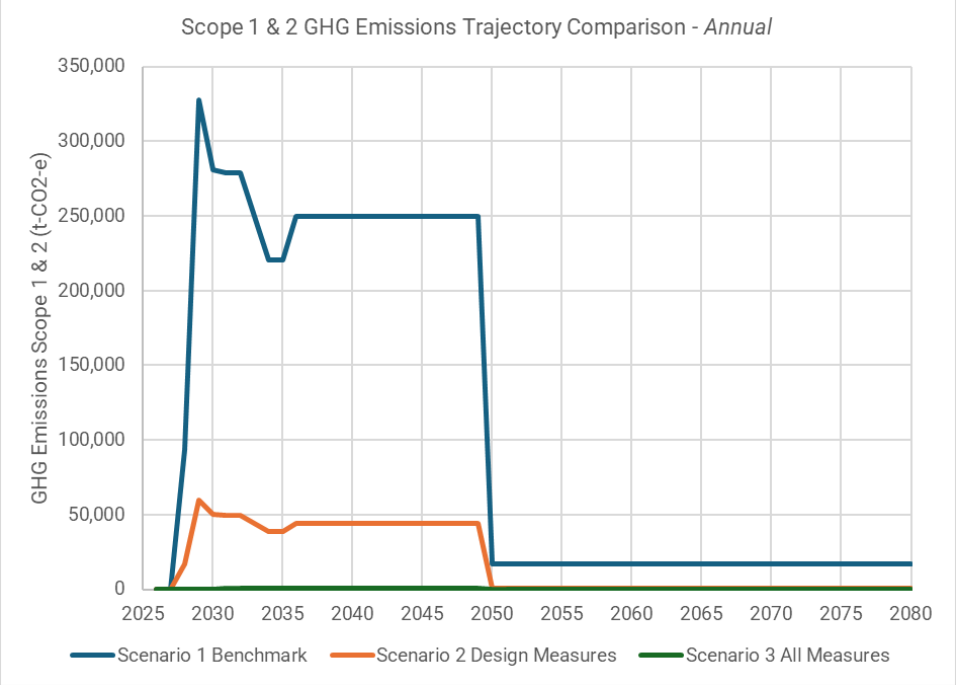

Figure 1: GHG Emissions Trajectory Estimation considering Implementation of Emissions Goals – Annual Value Plot

Per the requirements of the NGER Act the Proponent will be responsible for providing annual reports on the basis that annual energy use will exceed the 100TJ (27,778 MWh) per annum threshold for facilities, as seen in Table 8.

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 the tables above, noting scenarios 2 & 3 reflective of the project. 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 STACK Infrastructure to accompany a State Significant Development Application (SSDA) for a proposed data centre development at 78 Lockwood Road, Erskine Park (the site).

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 project site is located in the Penrith Local Government Area (LGA) and is approximately 40km west of the Sydney Central Business District (CBD), 20km west of the Parramatta CBD, and 10km north-east of the future Western Sydney International Airport.

The site is an irregular shaped 7.7-hectare lot bounded to the north by Lenore Drive and to the east by an E2 Environmental Conservation corridor that follows Ropes Creek. The site relies upon access from a cul-de-sac at the eastern end of Lockwood Road at the site's southern boundary. An aerial photograph is provided at Figure 2.

Figure 2: 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 and bulk earthworks.
- Temporary construction access from Lenore Drive.

- Construction of a three-storey data centre comprising two buildings, with a maximum height of 26.5 metres and a total gross floor area (GFA) of approximately 56,506m^2, including technical data halls, office and administrative areas, and ancillary circulation space.
- At grade under-croft car parking (34 spaces) within the building footprint, plus an additional 44 on-site spaces, providing a total of 78 parking spaces.
- Separate generator gantry accommodating 188 backup generators.
- Landscaping and associated public domain works.
- Extension and augmentation of physical infrastructure and utilities as required, including an on-site substation and water storage tanks integrated within the building footprints.
- Off-site works comprising the delivery of two 330kV transmission lines from the TransGrid Sydney West Substation site to the subject site, utilising existing road reserve along Lenore Drive.

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 (CO2-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 3: 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	2 & 3
Materials & Construction	Extraction, Transport, Manufacture & Construction	Energy	Manufacturing & Construction	3

1.3 Project Stages and Life

The proposed data centre development comprises two data centre buildings that will generally each be provided individually with associated supporting infrastructure with delivery of the buildings in two overlapping stages.

The following table 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 4: Project Staging

Stage	Building	Construction Start	Construction End	Operational Start
1	East Building	Jun-2026	Aug-2028	Sep-2028
2	West Building	Oct-2026	Jan-2029	Feb-2029

For the assessment, as the construction of each building stage heavily overlap, a single construction period has been utilised. Construction period emissions calculations have considered an even spread over the entire construction period.

From the Operational Start date above, it has been assumed that 50% of the associated building IT capacity will be functional with the remaining 50% to come online following 6 months of operation. Across the entire project this equates to the operational IT capacity starting from 25% and ramping to 100% in 25% capacity steps every 6 months. Operational emissions calculations from energy consumption have been prorated relative to these assumptions regarding the rate of IT capacity coming online.

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 development site, as seen in Figure 2, contains no existing buildings and is clear negating the need for demolition and land clearing works. The site is level and the development works are generally at/above grade therefore excavation works will be minimal. These elements are therefore not relevant or have material emissions and have not been accounted for in this GHG assessment.

GHG emissions from project water consumption (module B7) are not included in the assessment boundary as these emissions are negligible compared to other project sources of emissions. The project design incorporates entirely air cooled mechanical plant that does not consume water. Water consumption for the project will only be associated with items such as amenities and irrigation, and be minimal. Therefore the associated emissions that are indirect (scope 3) are negligible.

End-of-life stage (modules C1 to C4) covering decommissioning, closure and post-closure, and maintenance/ repair/ replacement activities (modules B1 to B5) are not included in the GHG assessment boundary. The GHG emissions associated with these stages are minimal relative to the GHG emissions associated with construction and operations. An estimate of these emissions and demonstration of minor nature is provided in Appendix C.

Due to the minimal amount of Office electrical energy consumption relative to other electrical consumption, the associated scope 3 emissions have not been included in the assessment. See Section 3.2.2 and Table 8 for quantification of Office electrical consumption. Scope 2 emissions for Office electrical consumption have been considered in the assessment.

Scope 3 emissions for the proponent's organisational operation emissions have not been included in the GHG assessment boundary as these are negligible relative to the other project sources of emissions. An estimate of these emissions and demonstration of minor nature is provided in Appendix C.

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 1.6. 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 reflective 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 target annual average PUE of 1.3 and are described under '*Avoid and Reduce*' in Section 3.3.

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 3.3.

Note that Scenario 3 reflects the overall project commitments. Scenario 2 is provided for information only to demonstrate the outcomes prior to offset pursuits.

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 100% 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 60% considered to occur in operation. For both 'Maximum Throughput' and 'Operational Throughput' a 90% IT Load occupancy factor has been applied.

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 188x backup generators total (94x per building) powered by diesel engines with an output of 3,100kW each at 11kV. To ensure proper operation and readiness for backup power provision, the generators undergo regular testing. The on-site diesel consumption for testing produces Scope 1 GHG emissions.

The following table details a calculation estimate of diesel fuel consumed per year for the project due to regular testing of all backup generators across the assessment scenarios. The associated energy consumption has been calculated using the energy content of 38.6 MJ/L from the National Greenhouse Accounts Factors (2025). The calculation is based on the estimation of test types, loading, frequency and run times provided by the project team and fuel consumption at the test loads based on the manufacturer data for a nominal generator unit selection. Diesel consumption from operation for backup purposes in the event of a mains power failure has not been considered due to the rarity and unpredictable nature of occurrence.

Table 5: Annual Diesel Consumption from Testing and Associated Energy Consumption

Test Type	Period	Duration (mins)	Annual Run Time for all Generators (hrs)	Test Load Percentage	Diesel Consumption at load (L/hr)	Annual Diesel Consumption (kL)	
						Scenario 2 & 3	Scenario 1
Run test	Monthly	5	188.0	0%	90	16.92	20.82
Off-load run	Quarterly	10	125.3	0%	90	11.28	13.88
Load banking	Annual	60	188.0	100%	770	144.76	178.17
Cooldown period	Post Annual	10	31.3	0%	90	2.82	3.47
Total Diesel Consumption (kL/yr)						**175.78**	**216.34**
Annual Diesel Energy Consumption (GJ/yr)						***6,785***	***8,351***

Note that there is no difference in the diesel consumption between the assessment scenarios 2 and 3 as these require the same backup generation capacity. For the 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. The increase for the Benchmark scenario is based on the ratio of PUE performance for the different scenarios per Section 3.1.2.

Diesel consumption also has been assumed to be equal in the assessment of both 'Maximum Throughput' and 'Operational Throughput' as the testing regime is not considered dependent on IT equipment utilisation.

Emissions from Refrigerant Use in Chiller Plant

The project is proposed to include 192 air-cooled chillers at approximately 670kWr rated capacity each to service data hall cooling needs. The nominal chiller unit selection is proposed to utilise R-1234ze refrigerant 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.

The following table details the proposed chiller plant details and a calculation estimate of emissions associated with refrigerant loss annual and at the end of plant life.

Table 6: Refrigerants in Chiller Plant

Parameter	Scenario 1	Scenarios 2 & 3
Chiller Unit Cooling Capacity (kWr)	670	670
Compressor Type	Centrifugal magnetic bearing	Centrifugal magnetic bearing
Refrigerant Type	R-134A	R-1234ze
Refrigerant Charge per Unit (kg)	1,340	1,340
Refrigerant GWP (kg-CO_2-e)	1,300	1
Number of Chillers	192	192
Total Refrigerant Quantity (kg)	**257,280**	**257,280**
Annual Leakage Rate	5%	5%
Annual Emissions from Leakage (t-CO_2-e/yr)	**16,723**	**13**
Design Life (yrs)	25	25
End of Life Loss	10%	10%
End of Life Emissions (t-CO_2-e/ 25 years)	**33,446**	**26**

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
- Tenant IT Equipment within the data centre (tenant electricity consumption is out of the proponent's control).

Imported electricity across the assessment scenarios (see Section 3.1.2) has differences due to the elements summarised below:

- **Scenario 1 Benchmark:** Data Centre infrastructure performance at the approximate national average annual PUE of 1.6 and typical office base building performance.
- **Scenario 2 Design Measures:** Data Centre performance improved to the target annual PUE of 1.3 due to pursued design energy efficiency measures and typical office base building performance, plus Hyperscale customers committed to procuring 100% renewable energy for IT Loads.
- **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.

The following table details the calculation assumptions and parameters utilised to establish the operational electricity consumption of the data halls across the project.

Table 7: Calculation Assumptions and Parameters to Estimate the Annual Electricity Consumption

Parameter	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*
Project IT Capacity (MW)	384 (2x 194)			
Facility Operation	24hrs / 7days per week – 8,760 hrs/year			
IT Occupied Capacity	90%			
IT Annual Load Utilisation	60%		100%	
Annual Diesel Consumption (kL/yr)	216.34	175.78	216.34	175.78
Power Usage Effectiveness (PUE) *Annual Average*	1.6	1.3	1.6	1.3

The annual Office Base Building annual energy consumption has been calculated based on the following parameters.

- 5.5 Star NABERS Energy for Office Base Building rated performance
- Rated Area: ≈4,440m^2 across the project (≈2,220m^2 for each building)
- Rated Hours: 50 per week

No difference in Office performance has been taken across the scenarios as 5.5 Star NABERS Energy for Office Base Building is considered the Benchmark performance and is equivalent to that targeted by the project.

The following table details the predictive estimate of electricity consumed for the project per year across Data Centre Infrastructure, Office Base Building services and Tenant IT equipment for the three project scenarios as described in Section 3.1.2. Estimates are based on the parameters as detailed above.

Table 8: Estimated Annual Electricity Consumption – Operational and Maximum Throughput

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*
Data Centre Infrastructure	1,087,564.5	543,057.3	1,814,153.9	906,352.0
Tenant IT Equipment	*1,816,473.6*	*1,816,473.6*	*3,027,456.0*	*3,027,456.0*
Office Base Building	281.6	281.6	281.6	281.6
Total Electricity Use (MWh/yr)	**2,904,319.7**	**2,359,812.5**	**4,841,891.5**	**3,934,089.7**
Total Electricity Use (TJ/yr)	*10,455.6*	*8,495.3*	*17,430.8*	*14,162.7*

Although Office electricity consumption is seen to be minor compared to the overall consumption (< 0.1% for lower data centre consumption under Operational Throughput), the associated scope 2 emissions have still been included in the assessment to provide full scope 2 coverage. The scope 3 emissions for the Office electrical consumption have however not been included due to the minor nature.

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;
- Losses through the electricity transmission and distribution network;
- Construction and materials embodied emissions.

The assessment of scope 3 emissions associated with the project diesel and electricity consumption utilised consumption estimate data as detailed in Table 5 and Table 8 respectively.

The calculation of emissions associated with the project construction and materials has utilised materials quantities across both buildings 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

Refer to Appendix D that details the materials and quantity inputs utilised in the NABERS Embodied Carbon Calculator reflective of the data in the NABERS Embodied Materials Form provided with the project SSDA submission.

Other sources of scope 3 emissions for the project exist but have not been included in the assessment as noted under Assessment Boundary (see Section 3.1.1). The following is a summary of the scope 3 emissions sources that have not been included and the associated justification:

- Demolition and land clearing – negligible emissions as site is already clear
- Office space electricity consumption – negligible emissions due to minor consumption
- Water consumption (module B7) – negligible emissions as project has minimal water use due to air-based heat rejection only
- Materials maintenance/ repair/ replacement activities (modules B1 to B5) – minor quantity of emissions relative to project per details in Appendix C.
- End-of-life (modules C1 to C4) – minor quantity of emissions relative to project per details in Appendix C.

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 3 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.

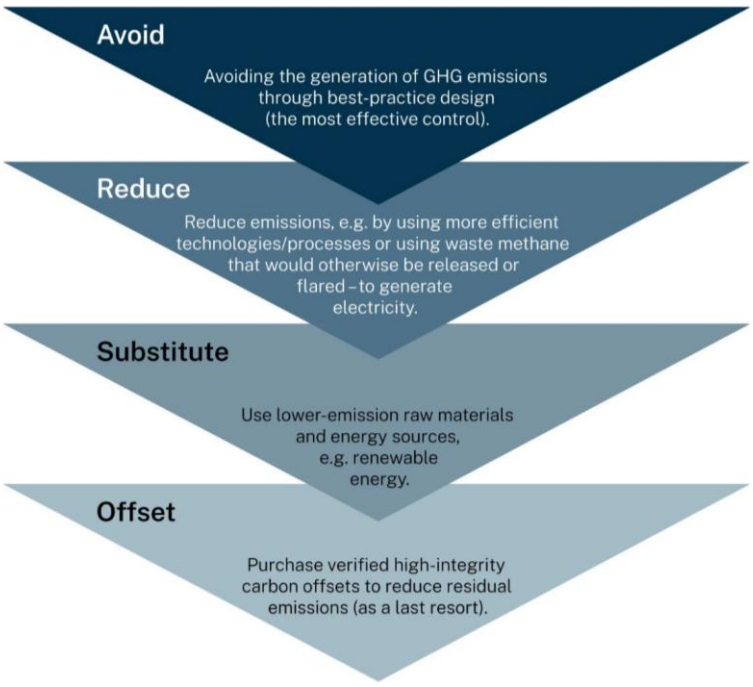

Figure 3: GHG Emissions Mitigation Hierarchy (source: NSW Guide for Large Emitters)

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 1.3 annual average:

- Hyperscale customers that are committed to procuring 100% renewable electricity for IT loads, i.e. zero scope 2 emissions for IT load electricity
- Elevated data hall cooling setpoint temperature and relaxed humidity setpoints combined with direct to chip liquid cooling capability to maximise efficiency of mechanical plant
- 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 115kWe per data centre building, 230kWe minimum 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 accordance with the proponent's Climate Pledge, i.e. zero residual scope 1 & 2 emissions from 2050 onwards, through consideration of a combination of the following measures:
    - Utilisation of renewable bio-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.

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 Methodology and Assumptions

3.4.1 General Methodologies

The following section provides a descriptions of the general methodologies utilised to determine the estimations of GHG emissions according to the source including method details of activity rate estimations.

Diesel Consumption

Emissions from diesel use were calculated by multiplying the quantity of diesel consumed by the scope 1 and 3 emissions factors from the National Greenhouse Accounts Factors (2025) for diesel oil. Generator consumed diesel quantity was calculated from the project advised testing regime including test types, loads, frequency and duration, combined with fuel consumption details for the nominal generator units (see calculation in Section 3.2.1). Generators were assumed to commence service at quantities in line with the quantity of operational IT capacity with testing diesel consumption ramped with the rate of online IT capacity described in Section 1.3.

Refrigerants

Emissions from refrigerants were calculated by multiplying the leakage and end-of-life lost refrigerant rates by the total refrigerant charge and global warming potential for the nominated refrigerant type. The total refrigerant charge was established from cooling capacity of the nominated project chiller equipment, number of units and an assumed refrigerant charge density amount. Chillers were assumed to commence service at quantities in line with the quantity of operational IT capacity with refrigerant loss ramped with the rate of online IT capacity described in Section 1.3.

Electricity Consumption

Emissions from electricity consumption were calculated by multiplying the consumed quantity of electricity in each year by the associated projected year scope 2 and 3 emissions factors from the Australia's Emissions Projections (2025) for NSW supplied electricity.

Electricity consumption of IT equipment per year was calculated based on the project IT Load capacity multiplied by the assumptions for average occupation and utilisation loading, and a full year of annual operational hours reflective of constant operation. IT electricity consumption was ramped with the rate of online IT capacity described in Section 1.3.

Electricity consumption for non-IT data centre infrastructure was calculated based on the annual average Power Utilisation Effectiveness (PUE) targeted for the project (or set for the Benchmark scenario), the annual IT equipment electrical consumption and the backup generator diesel consumption. PUE is defined as the ratio of Total Data Centre Energy to the IT Equipment Energy. Electricity consumption of non-IT data centre plant was ramped with the rate of online IT capacity described in Section 1.3.

Office base building electricity consumption was established from the project NABERS Energy for Offices target for the Office NLA and operational assumptions. The Office space per building (50% of the total office electricity consumption) has been taken as operational from the Operational Start date of each building as per Section 1.3 .

Materials Use

Embodied emissions from materials use was estimated using the NABERS Embodied Emissions Calculator and associated built in methodologies for the breakdown of project material types and quantities provided by the project Quantity Surveyor, assumed sourced within the Sydney region. Generally the calculator multiplies the quantities by the emissions factor associated with the material type and source location.

3.4.2 Assumptions

The following summary of 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 2kg/kWr

- 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 1.6 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 60% considered to occur in operation.
- For both 'Maximum Throughput' and 'Operational Throughput' a 90% IT Load occupancy factor has been applied.
- Emissions related to operational energy consumption are assumed to be relative to the amount of IT capacity that is online and the ramp up following operational commencement.
- 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
- Materials embodied carbon and construction related emissions are assumed to be evenly spread over the estimated construction period for the purposes of assessment.

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 (2025) both published by the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Table 9: Australian National Greenhouse Accounts Factors (2025) Relevant to Assessment

Source	Year	Emissions Factors ($kg\text{-}CO_2\text{-}e$ / 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	

Source	Year	Emissions Factors (kg-CO_2-e / unit)			Unit
		Scope 1	*Scope 2*	*Scope 3*	
	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. For Scenario 2 Design Measures the emissions factors above have been utilised except for IT load electricity where a zero emission factor is used due to Hyperscale customers being committed to procuring 100% renewable electricity as described under '*Avoid and Reduce*' in Section 3.3. For Scenario 3 All Measures the emissions factors are those as for Scenario 2 adjusted according to the emissions mitigation measures as described under '*Substitute and Offset*' in Section 3.3.

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 comparison to the Benchmark scenario 1. Refer to Appendix B.1.1 for the full breakdown of emissions across all sources that corresponds to the table data.

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

Scenario	Design Measures *Operational Throughput*			Benchmark	Percentage Difference to Benchmark
Year	Scope 1 (t-CO_2-e)	Scope 2 (t-CO_2-e)	*Total Scope 1 + 2 (t-CO_2-e)*	*Total Scope 1 + 2 (t-CO_2-e)*	
2026	0	0	*0*	*0*	-
2027	0	0	*0*	*0*	-
2028	41	17,197	*17,238*	*93,404*	-81.5%
2029	224	59,736	*59,961*	*327,378*	-81.7%
2030	408	49,780	*50,188*	*280,628*	-82.1%
2031	489	48,875	*49,364*	*278,673*	-82.3%
2032	489	48,875	*49,364*	*278,673*	-82.3%
2033	489	43,445	*43,934*	*249,632*	-82.4%
2034	489	38,014	*38,503*	*220,592*	-82.5%
2035	489	38,014	*38,503*	*220,592*	-82.5%
2036	489	43,445	*43,934*	*249,632*	-82.4%
2037	489	43,445	*43,934*	*249,632*	-82.4%
2038	489	43,445	*43,934*	*249,632*	-82.4%
2039	489	43,445	*43,934*	*249,632*	-82.4%
2040	489	43,445	*43,934*	*249,632*	-82.4%
2041	489	43,445	*43,934*	*249,632*	-82.4%
2042	489	43,445	*43,934*	*249,632*	-82.4%
2043	489	43,445	*43,934*	*249,632*	-82.4%
2044	489	43,445	*43,934*	*249,632*	-82.4%
2045	489	43,445	*43,934*	*249,632*	-82.4%

2046	489	43,445	*43,934*	*249,632*	-82.4%
2047	489	43,445	*43,934*	*249,632*	-82.4%
2048	489	43,445	*43,934*	*249,632*	-82.4%
2049	489	43,445	*43,934*	*249,632*	-82.4%
2050	489	0	*489*	*17,309*	-97.2%
2051	489	0	*489*	*17,309*	-97.2%
2052	489	0	*489*	*17,309*	-97.2%
2053	489	0	*489*	*17,309*	-97.2%
2054	489	0	*489*	*17,309*	-97.2%
2055	489	0	*489*	*17,309*	-97.2%
2056	489	0	*489*	*17,309*	-97.2%
2057	489	0	*489*	*17,309*	-97.2%
2058	489	0	*489*	*17,309*	-97.2%
2059	489	0	*489*	*17,309*	-97.2%
2060	489	0	*489*	*17,309*	-97.2%
2061	489	0	*489*	*17,309*	-97.2%
2062	489	0	*489*	*17,309*	-97.2%
2063	489	0	*489*	*17,309*	-97.2%
2064	489	0	*489*	*17,309*	-97.2%
2065	489	0	*489*	*17,309*	-97.2%
2066	489	0	*489*	*17,309*	-97.2%
2067	489	0	*489*	*17,309*	-97.2%
2068	489	0	*489*	*17,309*	-97.2%
2069	489	0	*489*	*17,309*	-97.2%
2070	489	0	*489*	*17,309*	-97.2%
2071	489	0	*489*	*17,309*	-97.2%
2072	489	0	*489*	*17,309*	-97.2%
2073	489	0	*489*	*17,309*	-97.2%
2074	489	0	*489*	*17,309*	-97.2%
2075	489	0	*489*	*17,309*	-97.2%
2076	489	0	*489*	*17,309*	-97.2%
2077	489	0	*489*	*17,309*	-97.2%
2078	489	0	*489*	*17,309*	-97.2%
2079	489	0	*489*	*17,309*	-97.2%
2080	489	0	*489*	*17,309*	-97.2%
Total	**25,132**	**952,161**	***977,292***	***5,981,019***	**-83.7%**
Benchmark Totals	*889,272*	*5,091,747*	*5,981,019*	-	-
Difference	-864,141	-4,139,586	-5,003,727	-	-
% Difference	*-97.2%*	*-81.3%*	*-83.7%*	-	-

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 comparison to the Benchmark scenario 1. Refer to Appendix B.1.1 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***

Scenario	ALL Measures *Operational Throughput*			Benchmark	Percentage Difference to Benchmark
Year	Scope 1 (t-CO_2-e)	Scope 2 (t-CO_2-e)	*Total Scope 1 + 2 (t-CO_2-e)*	*Total Scope 1 + 2 (t-CO_2-e)*	
2026	0	0	*0*	*0*	-
2027	0	0	*0*	*0*	-
2028	41	0	*41*	*93,404*	-100.0%
2029	224	0	*224*	*327,378*	-99.9%
2030	408	0	*408*	*280,628*	-99.9%
2031	489	0	*489*	*278,673*	-99.8%
2032	489	0	*489*	*278,673*	-99.8%
2033	489	0	*489*	*249,632*	-99.8%
2034	489	0	*489*	*220,592*	-99.8%
2035	489	0	*489*	*220,592*	-99.8%
2036	489	0	*489*	*249,632*	-99.8%
2037	489	0	*489*	*249,632*	-99.8%
2038	489	0	*489*	*249,632*	-99.8%
2039	489	0	*489*	*249,632*	-99.8%
2040	489	0	*489*	*249,632*	-99.8%
2041	489	0	*489*	*249,632*	-99.8%
2042	489	0	*489*	*249,632*	-99.8%
2043	489	0	*489*	*249,632*	-99.8%
2044	489	0	*489*	*249,632*	-99.8%
2045	489	0	*489*	*249,632*	-99.8%
2046	489	0	*489*	*249,632*	-99.8%
2047	489	0	*489*	*249,632*	-99.8%
2048	489	0	*489*	*249,632*	-99.8%
2049	489	0	*489*	*249,632*	-99.8%
2050	0	0	*0*	*17,309*	-100.0%
2051	0	0	*0*	*17,309*	-100.0%
2052	0	0	*0*	*17,309*	-100.0%
2053	0	0	*0*	*17,309*	-100.0%
2054	0	0	*0*	*17,309*	-100.0%
2055	0	0	*0*	*17,309*	-100.0%
2056	0	0	*0*	*17,309*	-100.0%
2057	0	0	*0*	*17,309*	-100.0%
2058	0	0	*0*	*17,309*	-100.0%
2059	0	0	*0*	*17,309*	-100.0%
2060	0	0	*0*	*17,309*	-100.0%
2061	0	0	*0*	*17,309*	-100.0%
2062	0	0	*0*	*17,309*	-100.0%
2063	0	0	*0*	*17,309*	-100.0%
2064	0	0	*0*	*17,309*	-100.0%
2065	0	0	*0*	*17,309*	-100.0%
2066	0	0	*0*	*17,309*	-100.0%
2067	0	0	*0*	*17,309*	-100.0%

2068	0	0	*0*	*17,309*	-100.0%
2069	0	0	*0*	*17,309*	-100.0%
2070	0	0	*0*	*17,309*	-100.0%
2071	0	0	*0*	*17,309*	-100.0%
2072	0	0	*0*	*17,309*	-100.0%
2073	0	0	*0*	*17,309*	-100.0%
2074	0	0	*0*	*17,309*	-100.0%
2075	0	0	*0*	*17,309*	-100.0%
2076	0	0	*0*	*17,309*	-100.0%
2077	0	0	*0*	*17,309*	-100.0%
2078	0	0	*0*	*17,309*	-100.0%
2079	0	0	*0*	*17,309*	-100.0%
2080	0	0	*0*	*17,309*	-100.0%
Total	**9,967**	**0**	***9,967***	***5,981,019***	**-99.8%**
Benchmark Totals	*889,272*	*5,091,747*	*5,981,019*	-	-
Difference	-879,305	-5,091,747	-5,971,052	-	-
% Difference	*-98.9%*	*-100.0%*	*-99.8%*	-	-

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 comparison to the Benchmark scenario 1. Refer to Appendix B.1.2 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 100% 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-CO_2-e) Estimation – **Maximum** Throughput – **Design Measures Scenario 2***

Scenario	**Design Measures** ***Operational Throughput***			**Benchmark**	**Percentage Difference to Benchmark**
Year	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	***Total Scope 1 + 2 (t-CO_2-e)***	***Total Scope 1 + 2 (t-CO_2-e)***	
2026	0	0	*0*	*0*	-
2027	0	0	*0*	*0*	-
2028	41	28,701	*28,742*	*154,760*	-81.4%
2029	224	99,699	*99,923*	*540,511*	-81.5%
2030	408	83,082	*83,490*	*458,239*	-81.8%
2031	489	81,572	*82,061*	*453,054*	-81.9%
2032	489	81,572	*82,061*	*453,054*	-81.9%
2033	489	72,508	*72,997*	*404,638*	-82.0%
2034	489	63,445	*63,934*	*356,222*	-82.1%
2035	489	63,445	*63,934*	*356,222*	-82.1%
2036	489	72,508	*72,997*	*404,638*	-82.0%
2037	489	72,508	*72,997*	*404,638*	-82.0%
2038	489	72,508	*72,997*	*404,638*	-82.0%

2039	489	72,508	*72,997*	*404,638*	-82.0%
2040	489	72,508	*72,997*	*404,638*	-82.0%
2041	489	72,508	*72,997*	*404,638*	-82.0%
2042	489	72,508	*72,997*	*404,638*	-82.0%
2043	489	72,508	*72,997*	*404,638*	-82.0%
2044	489	72,508	*72,997*	*404,638*	-82.0%
2045	489	72,508	*72,997*	*404,638*	-82.0%
2046	489	72,508	*72,997*	*404,638*	-82.0%
2047	489	72,508	*72,997*	*404,638*	-82.0%
2048	489	72,508	*72,997*	*404,638*	-82.0%
2049	489	72,508	*72,997*	*404,638*	-82.0%
2050	489	0	*489*	*17,309*	-97.2%
2051	489	0	*489*	*17,309*	-97.2%
2052	489	0	*489*	*17,309*	-97.2%
2053	489	0	*489*	*17,309*	-97.2%
2054	489	0	*489*	*17,309*	-97.2%
2055	489	0	*489*	*17,309*	-97.2%
2056	489	0	*489*	*17,309*	-97.2%
2057	489	0	*489*	*17,309*	-97.2%
2058	489	0	*489*	*17,309*	-97.2%
2059	489	0	*489*	*17,309*	-97.2%
2060	489	0	*489*	*17,309*	-97.2%
2061	489	0	*489*	*17,309*	-97.2%
2062	489	0	*489*	*17,309*	-97.2%
2063	489	0	*489*	*17,309*	-97.2%
2064	489	0	*489*	*17,309*	-97.2%
2065	489	0	*489*	*17,309*	-97.2%
2066	489	0	*489*	*17,309*	-97.2%
2067	489	0	*489*	*17,309*	-97.2%
2068	489	0	*489*	*17,309*	-97.2%
2069	489	0	*489*	*17,309*	-97.2%
2070	489	0	*489*	*17,309*	-97.2%
2071	489	0	*489*	*17,309*	-97.2%
2072	489	0	*489*	*17,309*	-97.2%
2073	489	0	*489*	*17,309*	-97.2%
2074	489	0	*489*	*17,309*	-97.2%
2075	489	0	*489*	*17,309*	-97.2%
2076	489	0	*489*	*17,309*	-97.2%
2077	489	0	*489*	*17,309*	-97.2%
2078	489	0	*489*	*17,309*	-97.2%
2079	489	0	*489*	*17,309*	-97.2%
2080	489	0	*489*	*17,309*	-97.2%
Total	**25,132**	**1,589,137**	***1,614,269***	***9,378,228***	**-82.8%**
Benchmark Totals	*889,272*	*8,488,956*	*9,378,228*	-	-
Difference	-864,141	-6,899,819	-7,763,959	-	-
% Difference	*-97.2%*	*-81.3%*	*-82.8%*	-	-

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 comparison to the Benchmark scenario 1. Refer to Appendix B.1.2 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 100% 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 ($t\text{-}CO_2\text{-}e$) Estimation – **Maximum** Throughput – **All Measures Scenario 3***

Scenario	**ALL Measures** *Operational Throughput*			**Benchmark**	**Percentage Difference to Benchmark**
Year	**Scope 1 ($t\text{-}CO_2\text{-}e$)**	**Scope 2 ($t\text{-}CO_2\text{-}e$)**	***Total Scope 1 + 2 ($t\text{-}CO_2\text{-}e$)***	***Total Scope 1 + 2 ($t\text{-}CO_2\text{-}e$)***	
2026	0	0	*0*	*0*	-
2027	0	0	*0*	*0*	-
2028	41	0	*41*	*154,760*	-100.0%
2029	224	0	*224*	*540,511*	-100.0%
2030	408	0	*408*	*458,239*	-99.9%
2031	489	0	*489*	*453,054*	-99.9%
2032	489	0	*489*	*453,054*	-99.9%
2033	489	0	*489*	*404,638*	-99.9%
2034	489	0	*489*	*356,222*	-99.9%
2035	489	0	*489*	*356,222*	-99.9%
2036	489	0	*489*	*404,638*	-99.9%
2037	489	0	*489*	*404,638*	-99.9%
2038	489	0	*489*	*404,638*	-99.9%
2039	489	0	*489*	*404,638*	-99.9%
2040	489	0	*489*	*404,638*	-99.9%
2041	489	0	*489*	*404,638*	-99.9%
2042	489	0	*489*	*404,638*	-99.9%
2043	489	0	*489*	*404,638*	-99.9%
2044	489	0	*489*	*404,638*	-99.9%
2045	489	0	*489*	*404,638*	-99.9%
2046	489	0	*489*	*404,638*	-99.9%
2047	489	0	*489*	*404,638*	-99.9%
2048	489	0	*489*	*404,638*	-99.9%
2049	489	0	*489*	*404,638*	-99.9%
2050	0	0	*0*	*17,309*	-100.0%
2051	0	0	*0*	*17,309*	-100.0%
2052	0	0	*0*	*17,309*	-100.0%
2053	0	0	*0*	*17,309*	-100.0%
2054	0	0	*0*	*17,309*	-100.0%
2055	0	0	*0*	*17,309*	-100.0%
2056	0	0	*0*	*17,309*	-100.0%
2057	0	0	*0*	*17,309*	-100.0%
2058	0	0	*0*	*17,309*	-100.0%
2059	0	0	*0*	*17,309*	-100.0%

2060	0	0	*0*	*17,309*	-100.0%
2061	0	0	*0*	*17,309*	-100.0%
2062	0	0	*0*	*17,309*	-100.0%
2063	0	0	*0*	*17,309*	-100.0%
2064	0	0	*0*	*17,309*	-100.0%
2065	0	0	*0*	*17,309*	-100.0%
2066	0	0	*0*	*17,309*	-100.0%
2067	0	0	*0*	*17,309*	-100.0%
2068	0	0	*0*	*17,309*	-100.0%
2069	0	0	*0*	*17,309*	-100.0%
2070	0	0	*0*	*17,309*	-100.0%
2071	0	0	*0*	*17,309*	-100.0%
2072	0	0	*0*	*17,309*	-100.0%
2073	0	0	*0*	*17,309*	-100.0%
2074	0	0	*0*	*17,309*	-100.0%
2075	0	0	*0*	*17,309*	-100.0%
2076	0	0	*0*	*17,309*	-100.0%
2077	0	0	*0*	*17,309*	-100.0%
2078	0	0	*0*	*17,309*	-100.0%
2079	0	0	*0*	*17,309*	-100.0%
2080	0	0	*0*	*17,309*	-100.0%
Total	**9,967**	**0**	***9,967***	***9,378,228***	**-99.9%**
Benchmark Totals	*889,272*	*8,488,956*	*9,378,228*	-	-
Difference	-879,305	-8,488,956	-9,368,261	-	-
% Difference	*-98.9%*	*-100.0%*	*-99.9%*	-	-

3.5.2 Scope 3 Emissions Estimates

Upfront Materials and Construction Emissions

The overall 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 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	84,568
Transport, A4	2,537
Construction, A5	2,494
Total Scope 3 Emissions	**89,599**

The overall project upfront materials and construction scope 3 emissions are assumed to be evenly spread across the entire construction period shown in Section 1.3, for the purposes of assessment.

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.

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

Throughput	Operational Throughput		Maximum Throughput	
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	*19,600*	19,600	*19,600*	19,600
2027	*33,600*	33,600	*33,600*	33,600
2028	*38,452*	37,542	*41,681*	40,166
2029	*16,176*	13,668	*25,057*	20,884
2030	*24,321*	19,761	*40,467*	32,880
2031	*144*	117	*144*	117
2032	*29,185*	23,713	*48,561*	39,455
2033	*29,185*	23,713	*48,561*	39,455
2034	*144*	117	*144*	117
2035	*29,185*	23,713	*48,561*	39,455
2036	*144*	117	*144*	117
2037	*144*	117	*144*	117
2038	*144*	117	*144*	117
2039	*144*	117	*144*	117
2040	*144*	117	*144*	117
2041	*144*	117	*144*	117
2042	*144*	117	*144*	117
2043	*144*	117	*144*	117
2044	*144*	117	*144*	117
2045	*144*	117	*144*	117
2046	*144*	117	*144*	117
2047	*144*	117	*144*	117
2048	*144*	117	*144*	117
2049	*144*	117	*144*	117
2050	*144*	117	*144*	117
2051	*144*	117	*144*	117
2052	*144*	117	*144*	117
2053	*144*	117	*144*	117

2054	*144*	117	*144*	117
2055	*144*	117	*144*	117
2056	*144*	117	*144*	117
2057	*144*	117	*144*	117
2058	*144*	117	*144*	117
2059	*144*	117	*144*	117
2060	*144*	117	*144*	117
2061	*144*	117	*144*	117
2062	*144*	117	*144*	117
2063	*144*	117	*144*	117
2064	*144*	117	*144*	117
2065	*144*	117	*144*	117
2066	*144*	117	*144*	117
2067	*144*	117	*144*	117
2068	*144*	117	*144*	117
2069	*144*	117	*144*	117
2070	*144*	117	*144*	117
2071	*144*	117	*144*	117
2072	*144*	117	*144*	117
2073	*144*	117	*144*	117
2074	*144*	117	*144*	117
2075	*144*	117	*144*	117
2076	*144*	117	*144*	117
2077	*144*	117	*144*	117
2078	*144*	117	*144*	117
2079	*144*	117	*144*	117
2080	*144*	117	*144*	117
Total	***226,493***	**200,825**	***312,876***	**271,012**
Difference to Benchmark		-24,276		-40,473
% Difference		*-10.8%*		*-13.0%*

3.5.3 Emissions Estimate Summary

The following table details the estimated project lifetime GHG emissions broken down per scope and assessed sources associated with the project for the assessment scenarios as detailed in Section 3.1.2.

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

Emissions Scope & Source	**Operational Throughput GHG Emissions (t-CO_2-e/yr)**			**Maximum Throughput GHG Emissions (t-CO_2-e/yr)**		
	Scenario 1 Benchmark	*Scenario 2 Design Measures*	*Scenario 3 All Measures*	*Scenario 1 Benchmark*	*Scenario 2 Design Measures*	*Scenario 3 All Measures*
Scope 1 - Diesel Use	30,118	24,471	9,705	30,118	24,471	9,705
Scope 1 - Refrigerants	859,154	661	262	859,154	661	262
Scope 2 - Non-IT (Proponent)	*1,906,863*	*952,161*	*0*	*3,180,817*	*1,589,137*	*0*
Scope 2 - Office Base Building (Proponent)	*542*	*542*	*0*	*542*	*542*	*0*

Scope 2 - IT (Tenant)	*3,184,884*	*0*	*0*	*5,308,140*	*0*	*0*
Scope 3 - Diesel Use	7,422	6,031	6,031	7,422	6,031	6,031
Scope 3 - Non-IT (Proponent)	48,487	24,211	24,211	80,881	40,408	40,408
Scope 3 - IT (Tenant)	80,984	80,984	80,984	134,974	134,974	134,974
Scope 3 - Materials & Construction	89,599	89,599	89,599	89,599	89,599	89,599
Total Scope 1, 2 & 3	**6,208,053**	**1,178,659**	**210,792**	**9,691,646**	**1,885,822**	**280,979**

The following tables detail summaries of the GHG emissions estimates associated with the project over the design life for the assessment scenarios as detailed in Section 3.1.2 for the expected Operational Throughput and Maximum Throughput respectively. The annual average has also been provided based on the project life from construction commencement and through all operational years.

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

Emissions Scope	**Operational Throughput Lifetime GHG Emissions (t-CO_2-e)**				
	Scenario 1 Benchmark	*Scenario 2 Design Measures*	*% Difference to Benchmark*	*Scenario 3 All Measures*	*% Difference to Benchmark*
Scope 1 Subtotal	*889,272*	*25,132*	*-97.2%*	*9,967*	*-98.9%*
Scope 2 Subtotal	*5,092,288*	*952,702*	*-81.3%*	*0*	*-100.0%*
Total Scope 1 & 2	**5,981,561**	**977,834**	***-83.7%***	**9,967**	***-99.8%***
Average Annual 1 & 2	110,770	18,108		185	
Scope 3 Subtotal	226,493	200,825	*-11.3%*	200,825	*-11.3%*
Total Scope 1, 2 & 3	**6,208,053**	**1,178,659**	***-81.0%***	**210,792**	***-96.6%***
Average Annual 1, 2 & 3	114,964	21,827		3,904	

Table 18: Design Life Scope 1, 2 & 3 Emissions (t-CO_2-e) Estimate Summary Across Assessment Scenarios – Maximum Throughput

Emissions Scope	**Maximum Throughput Lifetime GHG Emissions (t-CO_2-e)**				
	Scenario 1 Benchmark	*Scenario 2 Design Measures*	*% Difference to Benchmark*	*Scenario 3 All Measures*	*% Difference to Benchmark*
Scope 1 Subtotal	*889,272*	*25,132*	*-97.2%*	*9,967*	*-98.9%*
Scope 2 Subtotal	*8,489,498*	*1,589,679*	*-81.3%*	*0*	*-100.0%*
Total Scope 1 & 2	**9,378,770**	**1,614,810**	***-82.8%***	**9,967**	***-99.9%***
Average Annual 1 & 2	173,681	29,904		185	
Scope 3 Subtotal	312,876	271,012	*-13.4%*	271,012	*-13.4%*
Total Scope 1, 2 & 3	**9,691,646**	**1,885,822**	***-80.5%***	**280,979**	***-97.1%***
Average Annual 1, 2 & 3	179,475	34,923		5,203	

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 over 80% for both Operational and Maximum Throughput. Following the inclusion of substitute and offset pursued initiatives under the All Measures Scenario 3, project scope 1 and 2 emissions are close to eliminated reduced by over 99.8% across the project design life for both Operational and Maximum Throughput. The annual average scope 1 & 2 emissions for the All Measures Scenario 3 have reduced to only 185 tCO_2-e/yr.

These significant reductions in scope 1 & 2 emissions are largely due to the elimination of indirect scope 2 emissions from electricity for both IT load, due to Hyperscale customer commitments, and non-IT load per the proponent's commitments. The majority of scope 1 & 2 emissions for the Benchmark scenario are from electricity use at over 90% of the total that are entirely eliminated for pursued project measures of Scenario 3 All Measures.

With the inclusion of Scope 3 emissions, compared to the Benchmark position a substantial reduction in overall emissions is supported still at over 80% reduction for the Design Measures and around 97% for All measures.

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 has been 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 review and be of the project mitigation assessment and the proposed offset strategies to confirm suitability. Refer to Appendix E 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, clarification was provided to confirm:

- The proponent will have a PPA for non-tenanted power (i.e. non-IT power) as their responsibility for emissions offset and future individual tenant's will be responsible for the GHG emissions of their own power use.
- The proponent intends to procure accredited GreenPower for the project through a PPA with a major electricity retailer as the means of emissions offsetting, similar to their current arrangement for existing sites.

4 Emissions Benchmarking and Goal Setting

4.1 Reporting Obligations

A corporation is required under the NGER Act to meet the reporting obligations of the act should a facility under operational control exceed any of the following trigger thresholds:

- 25,000 t-CO_2-e per year of Scope 1 and 2 emissions
- Production of 100 terajoules (TJ) (27,778 MWh) or more of energy per year
- Consumption of 100 terajoules (TJ) (27,778 MWh) or more of energy per year

Additional reporting obligations are also triggered if a corporation across all facilities under operational control exceed double (2x) any of the above thresholds.

The obligations include reporting emissions data annually across both Scope 1 direct emissions and Scope 2 indirect emissions amongst other relevant 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 of energy per year per the estimations provided in Table 8 of 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

The proponent has a Climate Pledge goal of reaching net-zero carbon (scope 1 and 2) emissions by the year 2050. In support of this goal, the proponent's Hyperscale customers are committed to procuring 100% renewable electricity for IT loads eliminating the associated indirect scope 2 emissions from the start of operation (i.e. day 1). Additionally in support of the goal, 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 (see Section 3.1.2 Scenario 2 Design Measures);
- Eliminate indirect scope 2 emissions for all non-IT electricity uses of the project by procuring 100% renewable sourced energy (e.g. Power Purchase Agreement (PPA) for accredited GreenPower) from the start of operation (i.e. day 1) (see Section 3.1.2 Scenario 3 All Measures); and
- Sustain net-zero carbon emissions across scope 1 & 2 from the year 2050 and throughout the project's life through considering the following measures individually or in combination to eliminate the remaining scope 1 emissions (see Section 3.1.2 Scenario 3 All Measures):
    - Utilisation of renewable bio-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.

4.3 Emissions Trajectory

The following Figure 4 and Figure 5 provide the estimated emissions trajectory over the life of the project taking into account the Proponent's emissions goals described in the previous section, firstly as an annual emissions values plot and then cumulative emissions. Scenarios are as per that described in Section 3.1.2.

From the figures the pursued initiatives under the Scenario 2 Design Measures provides substantial reduction in emissions compared to the Benchmark Scenario 1 over the project design life. Scenario 3 All Measures in support of the Proponent's emissions goals almost eliminate scope 1 & 2 emissions.

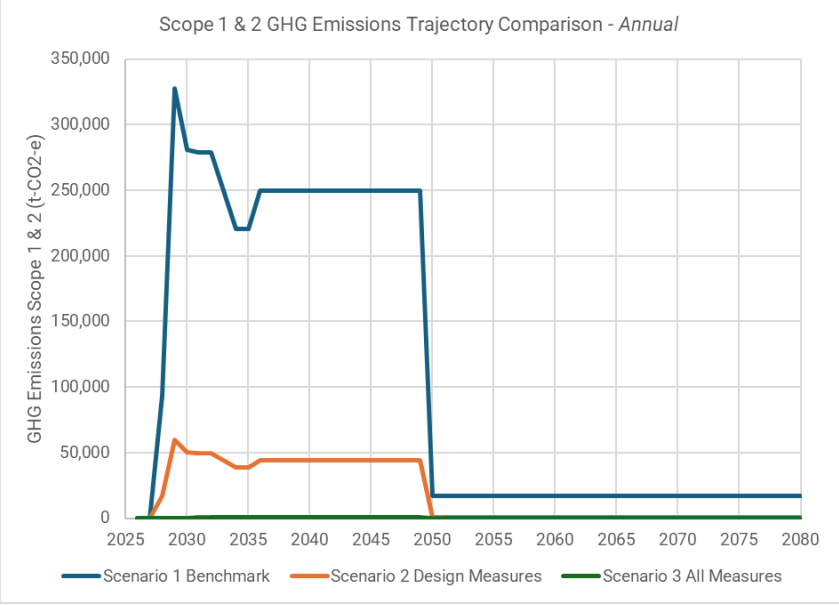

Figure 4: GHG Emissions Trajectory Estimation considering Implementation of Emissions Goals – Annual Value Plot

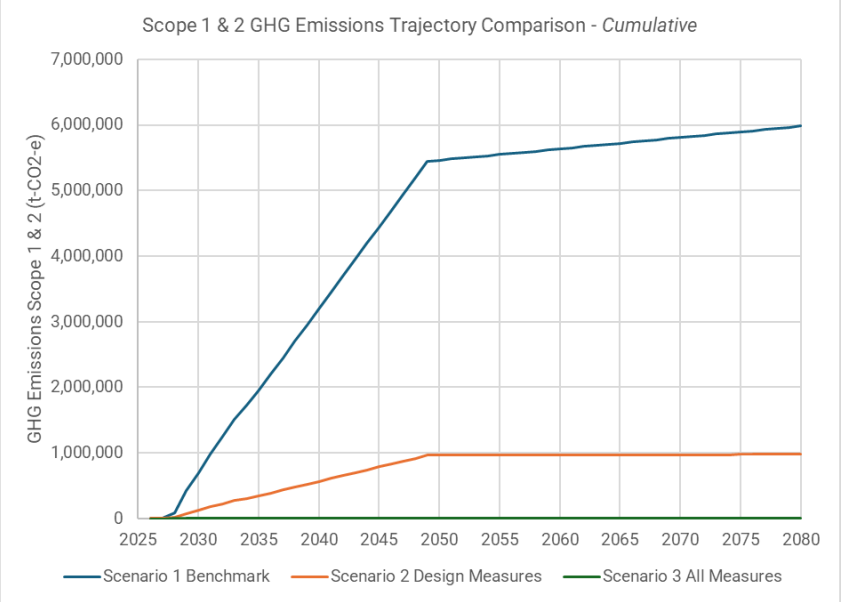

Figure 5: GHG Emissions Trajectory Estimation considering Implementation of Emissions Goals – Cumulative Value Plot

From the figures, it can be seen that the pursued initiatives in support of the Proponent's Scope 1 and 2 emissions goals show:

- A substantial reduction in emissions for Scenario 2 Design Measures compared to the Scenario 1 Benchmark;
- Emissions are effectively eliminated from operational commencement for Scenario 3 All Measures; and
- Emissions are 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, in combination with the proponent's Hyperscale customers commitments to procuring 100% renewable electricity for IT loads, provide significant reduction in Scope 1 and 2 emissions compared to a national average performance Benchmark scenario estimated at:
  - 83.7% for Operational Throughput; and
  - 82.8% for Maximum Throughput.
- Following consideration of All Measures being pursued in support of the Proponent's emissions goals, including additional commitments to procure 100% renewable electricity such as through a PPA for accredited GreenPower for all non-IT equipment from day 1 operation and achieve net-zero emissions (scope 1 & 2) for all non-IT equipment by 2050, the Scope 1 & 2 emissions:
  - Are almost entirely eliminated with a 99.8% & 99.9% reduction, for Operational & Maximum Throughput respectively, compared to a national average Benchmark scenario; and
  - Are well below the NSW Guide for Large Emitters threshold of 25,000 Tonnes CO_2-e/yr at only an estimated 185 t-CO_2-e/yr on average over the project design life.
- Considering scope 1, 2 & 3 emissions in total, compared to the Benchmark position a substantial reduction in overall emissions is supported still at over 80% reduction for the Design Measures and around 97% for All Measures being pursued.

5.1 Disclaimer

Although the details presented in this report have been established in accordance with the requirements of the NSW Guide for Large Emitters, all quantified data are estimates only based on the preliminary design information and therefore contain a level of uncertainty.

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
- Sintesis_eXcellent_GVAF_Air-Cooled_Chiller Data Sheet
- 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

The following tables detail the Scope 1 and 2 activity and emissions data for the Operational throughput and assessment scenarios. Tables reflect the template format as detailed in Appendix D of the NSW Guide for Large Emitters.

Input data and assumptions utilised to establish the production rates detailed in the tables can be found in Section 3.2.1 for Scope 1 emissions sources and in Section 3.2.2 for Scope 2 emissions sources. The production rates generally have been multiplied by the detailed 'Operational IT Capacity' value of each year based on the rate of IT capacity coming online as described in Section 1.3. 50% of the office production rate, i.e. office space per building, has been taken as operational from the Operational Start date of each building as per Section 1.3.

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 19: 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	Office Electricity	IT Electricity	**Total Scope 1+2 ($t\text{-}CO_2\text{-}e$)**
Production Rate		216.34	257,280	1,087,564	281.6	1,816,474	
Units		kL/yr	kg	MWh/yr	MWh/yr	MWh/yr	
Source		Generators	Chillers	Grid	Grid	Grid	
Sector		Energy	IPPU	Energy	Energy	Energy	
Sub Sector		Buildings	ODP	Buildings	Buildings	Buildings	
Year	***Operational IT Capacity***	**Scope 1 ($t\text{-}CO_2\text{-}e$)**	**Scope 1 ($t\text{-}CO_2\text{-}e$)**	**Scope 2 ($t\text{-}CO_2\text{-}e$)**	**Scope 2 ($t\text{-}CO_2\text{-}e$)**	**Scope 2 ($t\text{-}CO_2\text{-}e$)**	
2026	*0.0%*	0	0	0	0	0	*0*
2027	*0.0%*	0	0	0	0	0	*0*
2028	*8.3%*	49	1,394	34,440	18	57,522	*93,421*
2029	*45.8%*	269	7,665	119,632	65	199,812	*327,442*
2030	*83.3%*	489	13,936	99,693	31	166,510	*280,659*
2031	*100.0%*	586	16,723	97,881	25	163,483	*278,698*
2032	*100.0%*	586	16,723	97,881	25	163,483	*278,698*
2033	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2034	*100.0%*	586	16,723	76,130	20	127,153	*220,612*
2035	*100.0%*	586	16,723	76,130	20	127,153	*220,612*
2036	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2037	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2038	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2039	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2040	*100.0%*	586	16,723	87,005	23	145,318	*249,655*

2041	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2042	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2043	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2044	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2045	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2046	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2047	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2048	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2049	*100.0%*	586	16,723	87,005	23	145,318	*249,655*
2050	*100.0%*	586	16,723	0	0	0	*17,309*
2051	*100.0%*	586	16,723	0	0	0	*17,309*
2052	*100.0%*	586	16,723	0	0	0	*17,309*
2053	*100.0%*	586	16,723	0	0	0	*17,309*
2054	*100.0%*	586	16,723	0	0	0	*17,309*
2055	*100.0%*	586	16,723	0	0	0	*17,309*
2056	*100.0%*	586	16,723	0	0	0	*17,309*
2057	*100.0%*	586	16,723	0	0	0	*17,309*
2058	*100.0%*	586	16,723	0	0	0	*17,309*
2059	*100.0%*	586	16,723	0	0	0	*17,309*
2060	*100.0%*	586	16,723	0	0	0	*17,309*
2061	*100.0%*	586	16,723	0	0	0	*17,309*
2062	*100.0%*	586	16,723	0	0	0	*17,309*
2063	*100.0%*	586	16,723	0	0	0	*17,309*
2064	*100.0%*	586	16,723	0	0	0	*17,309*
2065	*100.0%*	586	16,723	0	0	0	*17,309*
2066	*100.0%*	586	16,723	0	0	0	*17,309*
2067	*100.0%*	586	16,723	0	0	0	*17,309*
2068	*100.0%*	586	16,723	0	0	0	*17,309*
2069	*100.0%*	586	16,723	0	0	0	*17,309*
2070	*100.0%*	586	16,723	0	0	0	*17,309*
2071	*100.0%*	586	16,723	0	0	0	*17,309*
2072	*100.0%*	586	16,723	0	0	0	*17,309*
2073	*100.0%*	586	16,723	0	0	0	*17,309*
2074	*100.0%*	586	16,723	0	0	0	*17,309*
2075	*100.0%*	586	16,723	0	0	0	*17,309*
2076	*100.0%*	586	16,723	0	0	0	*17,309*
2077	*100.0%*	586	16,723	0	0	0	*17,309*
2078	*100.0%*	586	16,723	0	0	0	*17,309*
2079	*100.0%*	586	16,723	0	0	0	*17,309*
2080	*100.0%*	586	16,723	0	0	0	*17,309*
	Totals	**30,118**	**859,154**	**1,906,863**	**542**	**3,184,884**	***5,981,561***

Scenario 2: Design Measures

*Table 20: 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	Office Electricity	IT Electricity	**Total Scope 1+2**

Production Rate		175.78	257,280	543,057	281.6	1,816,474	**(t-CO_2-e)**
Units		kL/yr	kg	MWh/yr	MWh/yr	MWh/yr	
Source		Generators	Chillers	Grid	Grid	Grid	
Sector		Energy	IPPU	Energy	Energy	Energy	
Sub Sector		Buildings	ODP	Buildings	Buildings	Buildings	
Year	***Operational IT Capacity***	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	0	0	*0*
2027	*0.0%*	0	0	0	0	0	*0*
2028	*8.3%*	40	1	17,197	18	0	*17,255*
2029	*45.8%*	218	6	59,736	65	0	*60,025*
2030	*83.3%*	397	11	49,780	31	0	*50,219*
2031	*100.0%*	476	13	48,875	25	0	*49,390*
2032	*100.0%*	476	13	48,875	25	0	*49,390*
2033	*100.0%*	476	13	43,445	23	0	*43,956*
2034	*100.0%*	476	13	38,014	20	0	*38,523*
2035	*100.0%*	476	13	38,014	20	0	*38,523*
2036	*100.0%*	476	13	43,445	23	0	*43,956*
2037	*100.0%*	476	13	43,445	23	0	*43,956*
2038	*100.0%*	476	13	43,445	23	0	*43,956*
2039	*100.0%*	476	13	43,445	23	0	*43,956*
2040	*100.0%*	476	13	43,445	23	0	*43,956*
2041	*100.0%*	476	13	43,445	23	0	*43,956*
2042	*100.0%*	476	13	43,445	23	0	*43,956*
2043	*100.0%*	476	13	43,445	23	0	*43,956*
2044	*100.0%*	476	13	43,445	23	0	*43,956*
2045	*100.0%*	476	13	43,445	23	0	*43,956*
2046	*100.0%*	476	13	43,445	23	0	*43,956*
2047	*100.0%*	476	13	43,445	23	0	*43,956*
2048	*100.0%*	476	13	43,445	23	0	*43,956*
2049	*100.0%*	476	13	43,445	23	0	*43,956*
2050	*100.0%*	476	13	0	0	0	*489*
2051	*100.0%*	476	13	0	0	0	*489*
2052	*100.0%*	476	13	0	0	0	*489*
2053	*100.0%*	476	13	0	0	0	*489*
2054	*100.0%*	476	13	0	0	0	*489*
2055	*100.0%*	476	13	0	0	0	*489*
2056	*100.0%*	476	13	0	0	0	*489*
2057	*100.0%*	476	13	0	0	0	*489*
2058	*100.0%*	476	13	0	0	0	*489*
2059	*100.0%*	476	13	0	0	0	*489*
2060	*100.0%*	476	13	0	0	0	*489*
2061	*100.0%*	476	13	0	0	0	*489*
2062	*100.0%*	476	13	0	0	0	*489*
2063	*100.0%*	476	13	0	0	0	*489*
2064	*100.0%*	476	13	0	0	0	*489*
2065	*100.0%*	476	13	0	0	0	*489*
2066	*100.0%*	476	13	0	0	0	*489*

2067	*100.0%*	476	13	0	0	0	*489*
2068	*100.0%*	476	13	0	0	0	*489*
2069	*100.0%*	476	13	0	0	0	*489*
2070	*100.0%*	476	13	0	0	0	*489*
2071	*100.0%*	476	13	0	0	0	*489*
2072	*100.0%*	476	13	0	0	0	*489*
2073	*100.0%*	476	13	0	0	0	*489*
2074	*100.0%*	476	13	0	0	0	*489*
2075	*100.0%*	476	13	0	0	0	*489*
2076	*100.0%*	476	13	0	0	0	*489*
2077	*100.0%*	476	13	0	0	0	*489*
2078	*100.0%*	476	13	0	0	0	*489*
2079	*100.0%*	476	13	0	0	0	*489*
2080	*100.0%*	476	13	0	0	0	*489*
	Totals	**24,471**	**661**	**952,161**	**542**	**0**	***977,834***

Scenario 3: All Measures

*Table 21: 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	Office Electricity	IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate		175.78	257,280	543,057	281.6	1,816,474	
Units		kL/yr	kg	MWh/yr	MWh/yr	MWh/yr	
Source		Generators	Chillers	Grid	Grid	Grid	
Sector		Energy	IPPU	Energy	Energy	Energy	
Sub Sector		Buildings	ODP	Buildings	Buildings	Buildings	
Year	***Operational IT Capacity***	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	0	0	*0*
2027	*0.0%*	0	0	0	0	0	*0*
2028	*8.3%*	40	1	0	0	0	*41*
2029	*45.8%*	218	6	0	0	0	*224*
2030	*83.3%*	397	11	0	0	0	*408*
2031	*100.0%*	476	13	0	0	0	*489*
2032	*100.0%*	476	13	0	0	0	*489*
2033	*100.0%*	476	13	0	0	0	*489*
2034	*100.0%*	476	13	0	0	0	*489*
2035	*100.0%*	476	13	0	0	0	*489*
2036	*100.0%*	476	13	0	0	0	*489*
2037	*100.0%*	476	13	0	0	0	*489*
2038	*100.0%*	476	13	0	0	0	*489*
2039	*100.0%*	476	13	0	0	0	*489*
2040	*100.0%*	476	13	0	0	0	*489*
2041	*100.0%*	476	13	0	0	0	*489*
2042	*100.0%*	476	13	0	0	0	*489*
2043	*100.0%*	476	13	0	0	0	*489*
2044	*100.0%*	476	13	0	0	0	*489*

2045	*100.0%*	476	13	0	0	0	*489*
2046	*100.0%*	476	13	0	0	0	*489*
2047	*100.0%*	476	13	0	0	0	*489*
2048	*100.0%*	476	13	0	0	0	*489*
2049	*100.0%*	476	13	0	0	0	*489*
2050	*100.0%*	0	0	0	0	0	*0*
2051	*100.0%*	0	0	0	0	0	*0*
2052	*100.0%*	0	0	0	0	0	*0*
2053	*100.0%*	0	0	0	0	0	*0*
2054	*100.0%*	0	0	0	0	0	*0*
2055	*100.0%*	0	0	0	0	0	*0*
2056	*100.0%*	0	0	0	0	0	*0*
2057	*100.0%*	0	0	0	0	0	*0*
2058	*100.0%*	0	0	0	0	0	*0*
2059	*100.0%*	0	0	0	0	0	*0*
2060	*100.0%*	0	0	0	0	0	*0*
2061	*100.0%*	0	0	0	0	0	*0*
2062	*100.0%*	0	0	0	0	0	*0*
2063	*100.0%*	0	0	0	0	0	*0*
2064	*100.0%*	0	0	0	0	0	*0*
2065	*100.0%*	0	0	0	0	0	*0*
2066	*100.0%*	0	0	0	0	0	*0*
2067	*100.0%*	0	0	0	0	0	*0*
2068	*100.0%*	0	0	0	0	0	*0*
2069	*100.0%*	0	0	0	0	0	*0*
2070	*100.0%*	0	0	0	0	0	*0*
2071	*100.0%*	0	0	0	0	0	*0*
2072	*100.0%*	0	0	0	0	0	*0*
2073	*100.0%*	0	0	0	0	0	*0*
2074	*100.0%*	0	0	0	0	0	*0*
2075	*100.0%*	0	0	0	0	0	*0*
2076	*100.0%*	0	0	0	0	0	*0*
2077	*100.0%*	0	0	0	0	0	*0*
2078	*100.0%*	0	0	0	0	0	*0*
2079	*100.0%*	0	0	0	0	0	*0*
2080	*100.0%*	0	0	0	0	0	*0*
	Totals	**9,705**	**262**	**0**	**0**	**0**	***9,967***

B.1.2 Maximum Throughput

The following tables detail the Scope 1 and 2 activity and emissions data for the Maximum throughput and assessment scenarios. Tables reflect the template format as detailed in Appendix D of the NSW Guide for Large Emitters.

Input data and assumptions utilised to establish the production rates detailed in the tables can be found in Section 3.2.1 for Scope 1 emissions sources and in Section 3.2.2 for Scope 2 emissions sources. The production rates generally have been multiplied by the detailed 'Operational IT Capacity' value of each year based on the rate of IT

capacity coming online as described in Section 1.3. 50% of the office production rate, i.e. office space per building, has been taken as operational from the Operational Start date of each building as per Section 1.3.

Note that the Maximum Throughput calculations based on the project at 100% 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 22: Scope 1 & 2 Emissions (t-CO_2-e) Breakdown Estimation – **Maximum** Throughput – **Benchmark Scenario 1***

Scenario		**Benchmark**					
Production		Diesel	Refrigerant	Non-IT Electricity	Office Electricity	IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate		216.34	257,280	1,814,154	281.6	3,027,456	
Units		kL/yr	kg	MWh/yr	MWh/yr	MWh/yr	
Source		Generators	Chillers	Grid	Grid	Grid	
Sector		Energy	IPPU	Energy	Energy	Energy	
Sub Sector		Buildings	ODP	Buildings	Buildings	Buildings	
Year	***Operational IT Capacity***	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	0	0	*0*
2027	*0.0%*	0	0	0	0	0	*0*
2028	*8.3%*	49	1,394	57,448	18	95,869	*154,778*
2029	*45.8%*	269	7,665	199,557	65	333,020	*540,575*
2030	*83.3%*	489	13,936	166,297	31	277,517	*458,270*
2031	*100.0%*	586	16,723	163,274	25	272,471	*453,080*
2032	*100.0%*	586	16,723	163,274	25	272,471	*453,080*
2033	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2034	*100.0%*	586	16,723	126,991	20	211,922	*356,242*
2035	*100.0%*	586	16,723	126,991	20	211,922	*356,242*
2036	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2037	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2038	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2039	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2040	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2041	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2042	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2043	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2044	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2045	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2046	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2047	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2048	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2049	*100.0%*	586	16,723	145,132	23	242,196	*404,661*
2050	*100.0%*	586	16,723	0	0	0	*17,309*
2051	*100.0%*	586	16,723	0	0	0	*17,309*
2052	*100.0%*	586	16,723	0	0	0	*17,309*

2053	*100.0%*	586	16,723	0	0	0	*17,309*
2054	*100.0%*	586	16,723	0	0	0	*17,309*
2055	*100.0%*	586	16,723	0	0	0	*17,309*
2056	*100.0%*	586	16,723	0	0	0	*17,309*
2057	*100.0%*	586	16,723	0	0	0	*17,309*
2058	*100.0%*	586	16,723	0	0	0	*17,309*
2059	*100.0%*	586	16,723	0	0	0	*17,309*
2060	*100.0%*	586	16,723	0	0	0	*17,309*
2061	*100.0%*	586	16,723	0	0	0	*17,309*
2062	*100.0%*	586	16,723	0	0	0	*17,309*
2063	*100.0%*	586	16,723	0	0	0	*17,309*
2064	*100.0%*	586	16,723	0	0	0	*17,309*
2065	*100.0%*	586	16,723	0	0	0	*17,309*
2066	*100.0%*	586	16,723	0	0	0	*17,309*
2067	*100.0%*	586	16,723	0	0	0	*17,309*
2068	*100.0%*	586	16,723	0	0	0	*17,309*
2069	*100.0%*	586	16,723	0	0	0	*17,309*
2070	*100.0%*	586	16,723	0	0	0	*17,309*
2071	*100.0%*	586	16,723	0	0	0	*17,309*
2072	*100.0%*	586	16,723	0	0	0	*17,309*
2073	*100.0%*	586	16,723	0	0	0	*17,309*
2074	*100.0%*	586	16,723	0	0	0	*17,309*
2075	*100.0%*	586	16,723	0	0	0	*17,309*
2076	*100.0%*	586	16,723	0	0	0	*17,309*
2077	*100.0%*	586	16,723	0	0	0	*17,309*
2078	*100.0%*	586	16,723	0	0	0	*17,309*
2079	*100.0%*	586	16,723	0	0	0	*17,309*
2080	*100.0%*	586	16,723	0	0	0	*17,309*
	Totals	**30,118**	**859,154**	**3,180,817**	**542**	**5,308,140**	***9,378,770***

Scenario 2: Design Measures

*Table 23: 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	Office Electricity	IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate		175.78	257,280	906,352	281.6	3,027,456	
Units		kL/yr	kg	MWh/yr	MWh/yr	MWh/yr	
Source		Generators	Chillers	Grid	Grid	Grid	
Sector		Energy	IPPU	Energy	Energy	Energy	
Sub Sector		Buildings	ODP	Buildings	Buildings	Buildings	
Year	***Operational IT Capacity***	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	0	0	*0*
2027	*0.0%*	0	0	0	0	0	*0*
2028	*8.3%*	40	1	28,701	18	0	*28,760*
2029	*45.8%*	218	6	99,699	65	0	*99,988*
2030	*83.3%*	397	11	83,082	31	0	*83,521*

2031	*100.0%*	476	13	81,572	25	0	*82,086*
2032	*100.0%*	476	13	81,572	25	0	*82,086*
2033	*100.0%*	476	13	72,508	23	0	*73,020*
2034	*100.0%*	476	13	63,445	20	0	*63,954*
2035	*100.0%*	476	13	63,445	20	0	*63,954*
2036	*100.0%*	476	13	72,508	23	0	*73,020*
2037	*100.0%*	476	13	72,508	23	0	*73,020*
2038	*100.0%*	476	13	72,508	23	0	*73,020*
2039	*100.0%*	476	13	72,508	23	0	*73,020*
2040	*100.0%*	476	13	72,508	23	0	*73,020*
2041	*100.0%*	476	13	72,508	23	0	*73,020*
2042	*100.0%*	476	13	72,508	23	0	*73,020*
2043	*100.0%*	476	13	72,508	23	0	*73,020*
2044	*100.0%*	476	13	72,508	23	0	*73,020*
2045	*100.0%*	476	13	72,508	23	0	*73,020*
2046	*100.0%*	476	13	72,508	23	0	*73,020*
2047	*100.0%*	476	13	72,508	23	0	*73,020*
2048	*100.0%*	476	13	72,508	23	0	*73,020*
2049	*100.0%*	476	13	72,508	23	0	*73,020*
2050	*100.0%*	476	13	0	0	0	*489*
2051	*100.0%*	476	13	0	0	0	*489*
2052	*100.0%*	476	13	0	0	0	*489*
2053	*100.0%*	476	13	0	0	0	*489*
2054	*100.0%*	476	13	0	0	0	*489*
2055	*100.0%*	476	13	0	0	0	*489*
2056	*100.0%*	476	13	0	0	0	*489*
2057	*100.0%*	476	13	0	0	0	*489*
2058	*100.0%*	476	13	0	0	0	*489*
2059	*100.0%*	476	13	0	0	0	*489*
2060	*100.0%*	476	13	0	0	0	*489*
2061	*100.0%*	476	13	0	0	0	*489*
2062	*100.0%*	476	13	0	0	0	*489*
2063	*100.0%*	476	13	0	0	0	*489*
2064	*100.0%*	476	13	0	0	0	*489*
2065	*100.0%*	476	13	0	0	0	*489*
2066	*100.0%*	476	13	0	0	0	*489*
2067	*100.0%*	476	13	0	0	0	*489*
2068	*100.0%*	476	13	0	0	0	*489*
2069	*100.0%*	476	13	0	0	0	*489*
2070	*100.0%*	476	13	0	0	0	*489*
2071	*100.0%*	476	13	0	0	0	*489*
2072	*100.0%*	476	13	0	0	0	*489*
2073	*100.0%*	476	13	0	0	0	*489*
2074	*100.0%*	476	13	0	0	0	*489*
2075	*100.0%*	476	13	0	0	0	*489*
2076	*100.0%*	476	13	0	0	0	*489*
2077	*100.0%*	476	13	0	0	0	*489*
2078	*100.0%*	476	13	0	0	0	*489*

2079	*100.0%*	476	13	0	0	0	*489*
2080	*100.0%*	476	13	0	0	0	*489*
	Totals	**24,471**	**661**	**1,589,137**	**542**	**0**	***1,614,810***

Scenario 3: All Measures

*Table 24: 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		IT Electricity	**Total Scope 1+2 (t-CO_2-e)**
Production Rate		175.78	257,280	906,352		3,027,456	
Units		kL/yr	kg	MWh/yr		MWh/yr	
Source		Generators	Chillers	Grid		Grid	
Sector		Energy	IPPU	Energy		Energy	
Sub Sector		Buildings	ODP	Buildings		Buildings	
Year	***Operational IT Capacity***	**Scope 1 (t-CO_2-e)**	**Scope 1 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	**Scope 2 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	0	0	*0*
2027	*0.0%*	0	0	0	0	0	*0*
2028	*8.3%*	40	1	0	0	0	*41*
2029	*45.8%*	218	6	0	0	0	*224*
2030	*83.3%*	397	11	0	0	0	*408*
2031	*100.0%*	476	13	0	0	0	*489*
2032	*100.0%*	476	13	0	0	0	*489*
2033	*100.0%*	476	13	0	0	0	*489*
2034	*100.0%*	476	13	0	0	0	*489*
2035	*100.0%*	476	13	0	0	0	*489*
2036	*100.0%*	476	13	0	0	0	*489*
2037	*100.0%*	476	13	0	0	0	*489*
2038	*100.0%*	476	13	0	0	0	*489*
2039	*100.0%*	476	13	0	0	0	*489*
2040	*100.0%*	476	13	0	0	0	*489*
2041	*100.0%*	476	13	0	0	0	*489*
2042	*100.0%*	476	13	0	0	0	*489*
2043	*100.0%*	476	13	0	0	0	*489*
2044	*100.0%*	476	13	0	0	0	*489*
2045	*100.0%*	476	13	0	0	0	*489*
2046	*100.0%*	476	13	0	0	0	*489*
2047	*100.0%*	476	13	0	0	0	*489*
2048	*100.0%*	476	13	0	0	0	*489*
2049	*100.0%*	476	13	0	0	0	*489*
2050	*100.0%*	0	0	0	0	0	*0*
2051	*100.0%*	0	0	0	0	0	*0*
2052	*100.0%*	0	0	0	0	0	*0*
2053	*100.0%*	0	0	0	0	0	*0*
2054	*100.0%*	0	0	0	0	0	*0*
2055	*100.0%*	0	0	0	0	0	*0*
2056	*100.0%*	0	0	0	0	0	*0*

2057	*100.0%*	0	0	0	0	0	*0*
2058	*100.0%*	0	0	0	0	0	*0*
2059	*100.0%*	0	0	0	0	0	*0*
2060	*100.0%*	0	0	0	0	0	*0*
2061	*100.0%*	0	0	0	0	0	*0*
2062	*100.0%*	0	0	0	0	0	*0*
2063	*100.0%*	0	0	0	0	0	*0*
2064	*100.0%*	0	0	0	0	0	*0*
2065	*100.0%*	0	0	0	0	0	*0*
2066	*100.0%*	0	0	0	0	0	*0*
2067	*100.0%*	0	0	0	0	0	*0*
2068	*100.0%*	0	0	0	0	0	*0*
2069	*100.0%*	0	0	0	0	0	*0*
2070	*100.0%*	0	0	0	0	0	*0*
2071	*100.0%*	0	0	0	0	0	*0*
2072	*100.0%*	0	0	0	0	0	*0*
2073	*100.0%*	0	0	0	0	0	*0*
2074	*100.0%*	0	0	0	0	0	*0*
2075	*100.0%*	0	0	0	0	0	*0*
2076	*100.0%*	0	0	0	0	0	*0*
2077	*100.0%*	0	0	0	0	0	*0*
2078	*100.0%*	0	0	0	0	0	*0*
2079	*100.0%*	0	0	0	0	0	*0*
2080	*100.0%*	0	0	0	0	0	*0*
	Totals	**9,705**	**262**	**0**	**0**	**0**	***9,967***

B.2 Scope 3 Emissions

B.2.1 Operational Throughput

The following tables detail the Scope 3 activity and emissions data for the Operational throughput and assessment scenarios. Tables reflect the template format as detailed in Appendix D of the NSW Guide for Large Emitters.

Input data and assumptions utilised to establish the production rates detailed in the tables can be found in Section 3.2.3 for the Scope 3 emissions sources. The production rates for diesel and electricity have been multiplied by the detailed 'Operational IT Capacity' value of each year based on the rate of IT capacity coming online as described in Section 1.3. The production rate for Materials & Construction has been multiplied by the detailed 'Portion of Construction Completion' vale of each year based on the construction program as described in Section 1.3.

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 25: Scope 3 Emissions (t-CO_2-e) Breakdown Estimation – **Operational** Throughput – **Benchmark Scenario 1***

Scenario	**Benchmark**				
Production	Diesel	Non-IT Electricity	IT Electricity	Materials & Construction	**Total Scope 3**

Production Rate		216.34	1,087,564	1,816,474	89,599		**(t-CO_2-e)**
Units		kL/yr	MWh/yr	MWh/yr	tCO_2-e		
Source		Generators	Grid	Grid	Various		
Sector		Energy	Energy	Energy	Energy		
Sub Sector		Buildings	Buildings	Buildings	Manufacture & Construction		
Year	***Operational IT Capacity***	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	***Portion of Construction Completion***	**Scope 3 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	*21.9%*	19,600	*19,600*
2027	*0.0%*	0	0	0	*37.5%*	33,600	*33,600*
2028	*8.3%*	12	1,813	3,027	*37.5%*	33,600	*38,452*
2029	*45.8%*	66	4,985	8,326	*3.1%*	2,800	*16,176*
2030	*83.3%*	120	9,063	15,137	-	0	*24,321*
2031	*100.0%*	144	0	0	-	0	*144*
2032	*100.0%*	144	10,876	18,165	-	0	*29,185*
2033	*100.0%*	144	10,876	18,165	-	0	*29,185*
2034	*100.0%*	144	0	0	-	0	*144*
2035	*100.0%*	144	10,876	18,165	-	0	*29,185*
2036	*100.0%*	144	0	0	-	0	*144*
2037	*100.0%*	144	0	0	-	0	*144*
2038	*100.0%*	144	0	0	-	0	*144*
2039	*100.0%*	144	0	0	-	0	*144*
2040	*100.0%*	144	0	0	-	0	*144*
2041	*100.0%*	144	0	0	-	0	*144*
2042	*100.0%*	144	0	0	-	0	*144*
2043	*100.0%*	144	0	0	-	0	*144*
2044	*100.0%*	144	0	0	-	0	*144*
2045	*100.0%*	144	0	0	-	0	*144*
2046	*100.0%*	144	0	0	-	0	*144*
2047	*100.0%*	144	0	0	-	0	*144*
2048	*100.0%*	144	0	0	-	0	*144*
2049	*100.0%*	144	0	0	-	0	*144*
2050	*100.0%*	144	0	0	-	0	*144*
2051	*100.0%*	144	0	0	-	0	*144*
2052	*100.0%*	144	0	0	-	0	*144*
2053	*100.0%*	144	0	0	-	0	*144*
2054	*100.0%*	144	0	0	-	0	*144*
2055	*100.0%*	144	0	0	-	0	*144*
2056	*100.0%*	144	0	0	-	0	*144*
2057	*100.0%*	144	0	0	-	0	*144*
2058	*100.0%*	144	0	0	-	0	*144*
2059	*100.0%*	144	0	0	-	0	*144*
2060	*100.0%*	144	0	0	-	0	*144*
2061	*100.0%*	144	0	0	-	0	*144*
2062	*100.0%*	144	0	0	-	0	*144*
2063	*100.0%*	144	0	0	-	0	*144*
2064	*100.0%*	144	0	0	-	0	*144*
2065	*100.0%*	144	0	0	-	0	*144*

2066	*100.0%*	144	0	0	-	0	*144*
2067	*100.0%*	144	0	0	-	0	*144*
2068	*100.0%*	144	0	0	-	0	*144*
2069	*100.0%*	144	0	0	-	0	*144*
2070	*100.0%*	144	0	0	-	0	*144*
2071	*100.0%*	144	0	0	-	0	*144*
2072	*100.0%*	144	0	0	-	0	*144*
2073	*100.0%*	144	0	0	-	0	*144*
2074	*100.0%*	144	0	0	-	0	*144*
2075	*100.0%*	144	0	0	-	0	*144*
2076	*100.0%*	144	0	0	-	0	*144*
2077	*100.0%*	144	0	0	-	0	*144*
2078	*100.0%*	144	0	0	-	0	*144*
2079	*100.0%*	144	0	0	-	0	*144*
2080	*100.0%*	144	0	0	-	0	*144*
	Total	**7,422**	**48,487**	**80,984**		**89,599**	**226,493**

Scenario 2 and 3: Design Measures and All Measures

*Table 26: 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		175.78	543,057	1,816,474	89,599		
Units		kL/yr	MWh/yr	MWh/yr	tCO_2-e		
Source		Generators	Grid	Grid	Various		
Sector		Energy	Energy	Energy	Energy		
Sub Sector		Buildings	Buildings	Buildings	Manufacture & Construction		
Year	***Operational IT Capacity***	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	***Portion of Construction Completion***	**Scope 3 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	*21.9%*	19,600	*19,600*
2027	*0.0%*	0	0	0	*37.5%*	33,600	*33,600*
2028	*8.3%*	10	905	3,027	*37.5%*	33,600	*37,542*
2029	*45.8%*	54	2,489	8,326	*3.1%*	2,800	*13,668*
2030	*83.3%*	98	4,525	15,137	-	0	*19,761*
2031	*100.0%*	117	0	0	-	0	*117*
2032	*100.0%*	117	5,431	18,165	-	0	*23,713*
2033	*100.0%*	117	5,431	18,165	-	0	*23,713*
2034	*100.0%*	117	0	0	-	0	*117*
2035	*100.0%*	117	5,431	18,165	-	0	*23,713*
2036	*100.0%*	117	0	0	-	0	*117*
2037	*100.0%*	117	0	0	-	0	*117*
2038	*100.0%*	117	0	0	-	0	*117*
2039	*100.0%*	117	0	0	-	0	*117*
2040	*100.0%*	117	0	0	-	0	*117*
2041	*100.0%*	117	0	0	-	0	*117*
2042	*100.0%*	117	0	0	-	0	*117*

2043	*100.0%*	117	0	0	-	0	*117*
2044	*100.0%*	117	0	0	-	0	*117*
2045	*100.0%*	117	0	0	-	0	*117*
2046	*100.0%*	117	0	0	-	0	*117*
2047	*100.0%*	117	0	0	-	0	*117*
2048	*100.0%*	117	0	0	-	0	*117*
2049	*100.0%*	117	0	0	-	0	*117*
2050	*100.0%*	117	0	0	-	0	*117*
2051	*100.0%*	117	0	0	-	0	*117*
2052	*100.0%*	117	0	0	-	0	*117*
2053	*100.0%*	117	0	0	-	0	*117*
2054	*100.0%*	117	0	0	-	0	*117*
2055	*100.0%*	117	0	0	-	0	*117*
2056	*100.0%*	117	0	0	-	0	*117*
2057	*100.0%*	117	0	0	-	0	*117*
2058	*100.0%*	117	0	0	-	0	*117*
2059	*100.0%*	117	0	0	-	0	*117*
2060	*100.0%*	117	0	0	-	0	*117*
2061	*100.0%*	117	0	0	-	0	*117*
2062	*100.0%*	117	0	0	-	0	*117*
2063	*100.0%*	117	0	0	-	0	*117*
2064	*100.0%*	117	0	0	-	0	*117*
2065	*100.0%*	117	0	0	-	0	*117*
2066	*100.0%*	117	0	0	-	0	*117*
2067	*100.0%*	117	0	0	-	0	*117*
2068	*100.0%*	117	0	0	-	0	*117*
2069	*100.0%*	117	0	0	-	0	*117*
2070	*100.0%*	117	0	0	-	0	*117*
2071	*100.0%*	117	0	0	-	0	*117*
2072	*100.0%*	117	0	0	-	0	*117*
2073	*100.0%*	117	0	0	-	0	*117*
2074	*100.0%*	117	0	0	-	0	*117*
2075	*100.0%*	117	0	0	-	0	*117*
2076	*100.0%*	117	0	0	-	0	*117*
2077	*100.0%*	117	0	0	-	0	*117*
2078	*100.0%*	117	0	0	-	0	*117*
2079	*100.0%*	117	0	0	-	0	*117*
2080	*100.0%*	117	0	0	-	0	*117*
	Total	**6,031**	**24,211**	**80,984**		**89,599**	**200,825**

B.2.2 Maximum Throughput

Note that the Maximum Throughput calculations based on the project at 100% 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 27: 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		216.34	1,814,154	3,027,456	89,599		
Units		kL/yr	MWh/yr	MWh/yr	tCO_2-e		
Source		Generators	Grid	Grid	Various		
Sector		Energy	Energy	Energy	Energy		
Sub Sector		Buildings	Buildings	Buildings	Manufacture & Construction		
Year	***Operational IT Capacity***	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	***Portion of Construction Completion***	**Scope 3 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	*21.9%*	19,600	*19,600*
2027	*0.0%*	0	0	0	*37.5%*	33,600	*33,600*
2028	*8.3%*	12	3,024	5,046	*37.5%*	33,600	*41,681*
2029	*45.8%*	66	8,315	13,876	*3.1%*	2,800	*25,057*
2030	*83.3%*	120	15,118	25,229	-	0	*40,467*
2031	*100.0%*	144	0	0	-	0	*144*
2032	*100.0%*	144	18,142	30,275	-	0	*48,561*
2033	*100.0%*	144	18,142	30,275	-	0	*48,561*
2034	*100.0%*	144	0	0	-	0	*144*
2035	*100.0%*	144	18,142	30,275	-	0	*48,561*
2036	*100.0%*	144	0	0	-	0	*144*
2037	*100.0%*	144	0	0	-	0	*144*
2038	*100.0%*	144	0	0	-	0	*144*
2039	*100.0%*	144	0	0	-	0	*144*
2040	*100.0%*	144	0	0	-	0	*144*
2041	*100.0%*	144	0	0	-	0	*144*
2042	*100.0%*	144	0	0	-	0	*144*
2043	*100.0%*	144	0	0	-	0	*144*
2044	*100.0%*	144	0	0	-	0	*144*
2045	*100.0%*	144	0	0	-	0	*144*
2046	*100.0%*	144	0	0	-	0	*144*
2047	*100.0%*	144	0	0	-	0	*144*
2048	*100.0%*	144	0	0	-	0	*144*
2049	*100.0%*	144	0	0	-	0	*144*
2050	*100.0%*	144	0	0	-	0	*144*
2051	*100.0%*	144	0	0	-	0	*144*
2052	*100.0%*	144	0	0	-	0	*144*
2053	*100.0%*	144	0	0	-	0	*144*
2054	*100.0%*	144	0	0	-	0	*144*
2055	*100.0%*	144	0	0	-	0	*144*
2056	*100.0%*	144	0	0	-	0	*144*
2057	*100.0%*	144	0	0	-	0	*144*
2058	*100.0%*	144	0	0	-	0	*144*
2059	*100.0%*	144	0	0	-	0	*144*
2060	*100.0%*	144	0	0	-	0	*144*
2061	*100.0%*	144	0	0	-	0	*144*

2062	*100.0%*	144	0	0	-	0	*144*
2063	*100.0%*	144	0	0	-	0	*144*
2064	*100.0%*	144	0	0	-	0	*144*
2065	*100.0%*	144	0	0	-	0	*144*
2066	*100.0%*	144	0	0	-	0	*144*
2067	*100.0%*	144	0	0	-	0	*144*
2068	*100.0%*	144	0	0	-	0	*144*
2069	*100.0%*	144	0	0	-	0	*144*
2070	*100.0%*	144	0	0	-	0	*144*
2071	*100.0%*	144	0	0	-	0	*144*
2072	*100.0%*	144	0	0	-	0	*144*
2073	*100.0%*	144	0	0	-	0	*144*
2074	*100.0%*	144	0	0	-	0	*144*
2075	*100.0%*	144	0	0	-	0	*144*
2076	*100.0%*	144	0	0	-	0	*144*
2077	*100.0%*	144	0	0	-	0	*144*
2078	*100.0%*	144	0	0	-	0	*144*
2079	*100.0%*	144	0	0	-	0	*144*
2080	*100.0%*	144	0	0	-	0	*144*
	Total	**7,422**	**80,881**	**134,974**		**89,599**	**312,876**

Scenario 2 and 3: Design Measures and All Measures

*Table 28: 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		175.78	906,352	3,027,456	89,599		
Units		kL/yr	MWh/yr	MWh/yr	tCO_2-e		
Source		Generators	Grid	Grid	Various		
Sector		Energy	Energy	Energy	Energy		
Sub Sector		Buildings	Buildings	Buildings	Manufacture & Construction		
Year	***Operational IT Capacity***	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	**Scope 3 (t-CO_2-e)**	***Portion of Construction Completion***	**Scope 3 (t-CO_2-e)**	
2026	*0.0%*	0	0	0	*21.9%*	19,600	*19,600*
2027	*0.0%*	0	0	0	*37.5%*	33,600	*33,600*
2028	*8.3%*	10	1,511	5,046	*37.5%*	33,600	*40,166*
2029	*45.8%*	54	4,154	13,876	*3.1%*	2,800	*20,884*
2030	*83.3%*	98	7,553	25,229	-	0	*32,880*
2031	*100.0%*	117	0	0	-	0	*117*
2032	*100.0%*	117	9,064	30,275	-	0	*39,455*
2033	*100.0%*	117	9,064	30,275	-	0	*39,455*
2034	*100.0%*	117	0	0	-	0	*117*
2035	*100.0%*	117	9,064	30,275	-	0	*39,455*
2036	*100.0%*	117	0	0	-	0	*117*
2037	*100.0%*	117	0	0	-	0	*117*
2038	*100.0%*	117	0	0	-	0	*117*

2039	*100.0%*	117	0	0	-	0	*117*
2040	*100.0%*	117	0	0	-	0	*117*
2041	*100.0%*	117	0	0	-	0	*117*
2042	*100.0%*	117	0	0	-	0	*117*
2043	*100.0%*	117	0	0	-	0	*117*
2044	*100.0%*	117	0	0	-	0	*117*
2045	*100.0%*	117	0	0	-	0	*117*
2046	*100.0%*	117	0	0	-	0	*117*
2047	*100.0%*	117	0	0	-	0	*117*
2048	*100.0%*	117	0	0	-	0	*117*
2049	*100.0%*	117	0	0	-	0	*117*
2050	*100.0%*	117	0	0	-	0	*117*
2051	*100.0%*	117	0	0	-	0	*117*
2052	*100.0%*	117	0	0	-	0	*117*
2053	*100.0%*	117	0	0	-	0	*117*
2054	*100.0%*	117	0	0	-	0	*117*
2055	*100.0%*	117	0	0	-	0	*117*
2056	*100.0%*	117	0	0	-	0	*117*
2057	*100.0%*	117	0	0	-	0	*117*
2058	*100.0%*	117	0	0	-	0	*117*
2059	*100.0%*	117	0	0	-	0	*117*
2060	*100.0%*	117	0	0	-	0	*117*
2061	*100.0%*	117	0	0	-	0	*117*
2062	*100.0%*	117	0	0	-	0	*117*
2063	*100.0%*	117	0	0	-	0	*117*
2064	*100.0%*	117	0	0	-	0	*117*
2065	*100.0%*	117	0	0	-	0	*117*
2066	*100.0%*	117	0	0	-	0	*117*
2067	*100.0%*	117	0	0	-	0	*117*
2068	*100.0%*	117	0	0	-	0	*117*
2069	*100.0%*	117	0	0	-	0	*117*
2070	*100.0%*	117	0	0	-	0	*117*
2071	*100.0%*	117	0	0	-	0	*117*
2072	*100.0%*	117	0	0	-	0	*117*
2073	*100.0%*	117	0	0	-	0	*117*
2074	*100.0%*	117	0	0	-	0	*117*
2075	*100.0%*	117	0	0	-	0	*117*
2076	*100.0%*	117	0	0	-	0	*117*
2077	*100.0%*	117	0	0	-	0	*117*
2078	*100.0%*	117	0	0	-	0	*117*
2079	*100.0%*	117	0	0	-	0	*117*
2080	*100.0%*	117	0	0	-	0	*117*
	Total	**6,031**	**40,408**	**134,974**		**89,599**	**271,012**

Appendix C Minor Excluded Sources of Emissions

The following appendix provides an estimate quantification of certain sources of emissions to demonstrate the minor/negligible amount compared to other project sources of emissions and justify exclusion from the assessment.

Operational Stage Materials Use and End-of-life Emissions

The project operational materials use from maintenance/ repair/ replacement activities (modules B1 to B5) and end-of-life (modules C1 to C4) scope 3 emissions have been outlined in the table below. The emissions have been established using the NABERS Embodied Carbon Calculator based on project materials quantity data across the entire project per the NABERS Embodied Materials Form provided with the SSDA submission.

Table 29: Estimated Scope 3 Emissions(t-CO_2-e) from Operational Stage Materials Use and End-of-life

Module	Lifetime Scope 3 Emissions (tCO_2-e)	Percentage of Total Scope 3 Lifetime Emissions [1]	Percentage of Total Scope 1,2 + 3 Lifetime Emissions [1]
Use stage embodied carbon (B1-B5)	14,046	10.3%	1.26%
End-of-life carbon (C)	2,754	2.0%	0.25%

Note: 1. Percentages are relative to the emissions of Scenario 2: Design Measures per Section 3.1.2.

As seen above, these emissions are very small relative to the overall emissions across other sources and were therefore not included in the assessment.

Organisation Operation Emissions

The following table details an estimate calculation of annual fuel consumption from vehicle use for staff and deliveries associated with the facility operation and associated calculation assumptions.

Table 30: Estimate of Vehicle Travel and Fuel Consumption associated with Proposed Facility

Vehicle Type	Staff Vehicles	Delivery Vehicles	Comments
Daily Project Travel Distance (km)	50	50	Distance estimation for round trip between origin and facility.
Annual Daily Trips	365	365	Considers constant operation due to critical nature of facility and one round trip per vehicle type per day.
Number of Vehicles	10	5	Staff estimated for daily infrastructure staff (not tenant staff outside proponent boundary), and deliveries estimated.
Annual Distance Travelled (km)	182,500	91,250	
Fuel Type	Petrol	Diesel	Based on majority of use per Australian Bureau of Statistics
Average Consumption Rate (L/100km)	11.1	12.8	Per Australian Bureau of Statistics reporting for passenger vehicles used for staff and light commercial vehicles use for delivery.
Annual Fuel Consumption (kL)	**20.3**	**11.7**	

The following table details the estimate of Scope 3 GHG emissions for the transport fuel use associated with the facility. Energy content and emissions factors have been sourced from the National Greenhouse Accounts Factors (2025) document according to the fuel type.

Table 31: Estimate of Scope 3 Emissions for Vehicle Travel associated with Proposed Facility

Item	Petrol Fuel	Diesel Fuel
Annual Fuel Consumption (kL)	20.3	11.7
Energy Content (GJ/kL)	34.2	38.6
Annual Fuel Energy (GJ/yr)	693	451
Emissions Factor (kg CO_2-e/GJ)	67.8	70.2
Emissions Per Fuel Type (tCO_2-e/yr)	47.0	31.6
Total Annual Scope 3 Transport Emissions (tCO_2-e/yr)	*78.6*	
Lifetime Scope 3 Transport Emissions (tCO_2-e)	**3,931.1**	
Percentage of Total Scope 3 Lifetime Emissions [1]	*3.27%*	
Percentage of Total Scope 1, 2 + 3 Lifetime Emissions [1]	***0.36%***	

Note: 1. Percentages are relative to the emissions of Scenario 2: Design Measures per Section 3.1.2.

As seen above, these emissions are very small relative to the overall emissions across other sources and were therefore not included in the assessment.

Appendix D NABERS Embodied Carbon Calculator Materials Input Data

The following figure details the inputs utilised in the NABERS Upfront Embodied Carbon Calculator reflective of the NABERS Embodied Materials Form provided with the project SSDA submission.

NABERS

Upfront Embodied Carbon Calculator

Material quantities

Enter all material quantities in this tab. Where product-specific emission factors are available, a new material category must be added to the '**Product specific EFs**' tab before it can be se
You can create groups of materials that are consistently used for curtain walls, windows, or doors in the '**Custom assemblies**' tab, which you can then select under the 'Custom assembly

Cell colour key:

Required
Optional
For reference
Error

Required columns are also marked with an asterisk *

Would you like to add an explanation for anything in this table?

Click the + button to the left to view a worked example

Materials (bill of quantities)

Provide a list of all the materials used in the building. See NABERS EC Rules section 7.3 for guidance on what materials to include in the rating.

Building section*	Material description and notes*	Material type*	Material category*	Material quantity*	Material unit*
Substructure		Concrete in-situ	>50 MPa to ≤65 MPa	37,450.00	m^3
Substructure		Concrete in-situ	>65 MPa to ≤80 MPa	16,050.00	m^3
Substructure		Concrete precast panel	Hollow core - precast concrete (inc. reinforcing)	21,400.00	m^3
Substructure		Concrete block	Concrete block (exc. core fill or reinforcing)	845,250.00	kg
Substructure		Concrete block	Solid AAC (no fill or reinforcing)	600.00	m^3
Substructure	Mortar	Concrete in-situ	≤10 MPa	950,000.00	kg
Substructure		Reinforcing steel	Bar & mesh reinforcing steel	6,418,650.00	kg
Substructure		Reinforcing steel	Fibre & strand reinforcing steel	481,400.00	kg
Substructure		Structural steel	Structural sections steel (welded beam, columns, angles, plates, pile:	1,300.00	tonne
Substructure		Structural steel	Structural formwork and decking steel (cold rolled - light weight)	150.00	tonne
Substructure		Structural steel	Painted structural sections steel (welded beam, columns, angles, pla	75.00	tonne
Substructure	Piles	Concrete in-situ	>40 MPa to ≤50 MPa	1,350.00	m^3
Substructure	Piles	Reinforcing steel	Bar & mesh reinforcing steel	147,400.00	kg
Envelope	Roof cladding	Steel cladding/roofing	Steel sheeting - painted	4,500.00	m^2
Envelope	Wall cladding	Steel cladding/roofing	Steel sheeting - painted	4,500.00	m^2
Envelope	Wall cladding	Aluminium cladding/roofing	Aluminium sheeting	5,830.80	kg
Envelope		Cement cladding/roofing	Fibre cement board	1,075.00	m^2
Envelope		Windows & doors	Window - aluminium frame - generic	450.00	m^2
Envelope		Curtain wall	Aluminium unitised type 1: 100% DGU 8T-16-44.2	1,300.00	m^2
Envelope	Brick cladding	Cement cladding/roofing	Fibre cement board	1,300.00	m^2
Envelope		Aluminium cladding/roofing	Aluminium sheeting	5,830.80	kg
Envelope		Roller doors	Roller doors	55.00	m^2
Envelope	Fire-rated doors	Windows & doors	Door - steel solid - generic	45.00	m^2
Internal		Ceilings & walls	Wall system steel frame - 2 sides plasterboard (92mm stud)	67,150.00	m^2
Internal		Windows & doors	Door - timber solid - generic	3,125.00	m^2
Internal	Elevator Doors	Aluminium cladding/roofing	Aluminium sheeting	433.92	kg
External work		Asphalt	Asphalt	400.00	tonne
External work		Concrete in-situ	>40 MPa to ≤50 MPa	310.00	m^3
External work		Reinforcing steel	Bar & mesh reinforcing steel	9,200.00	kg
Building services		Mechanical, electrical, and plumbir	Hospital or high services intensity building	52,746.00	m^2

Appendix E Independent Expert Review

Lehr Consultants International (Australia) Pty Ltd (ABN 92 124 107 973) is the evolution of a firm which began in 1969. Challenging the standard approach to Building Services engineering, LCI offers traditional and innovative consulting services worldwide, as well as access to cutting edge technological thought, applications and proprietary systems.

LCI Consultants is proudly employee-owned and Australian operated, backed by the global strength of Artelia Group.

VISIT US

www.lciconsultants.com.au

MELBOURNE

Level 17/242 Exhibition St
Melbourne, VIC 3000
P (03) 9230 5600

SYDNEY

Level 5/73 Miller St
North Sydney, NSW 2060
P: (02) 9157 0570

BRISBANE

Level 1/293 Queen St
Brisbane City, QLD 4000
P (07) 3831 3300

PERTH

Level 9/108 St Georges
Terrace, Perth WA 6000
P: (08) 9242 5857

CANBERRA

Level 2/1 Farrell Place
Canberra, ACT 2601
P: (02) 9157 0570

ADELAIDE

Level 4/91 King William St
Adelaide, SA, 5000
P: (08) 7078 8896