Ecologically Sustainable Development (ESD) Report

Mixed Use Development

33 – 37 Herbert Street, St Leonards

Project No.	P02799
Revision	02
Issued	21 April 2026
Client	Aqualand St Leonard Development Pty Ltd (Aqualand)

E-LAB Consulting

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ISSUE AND REVISION RECORD

DESIGN FINALISATION

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04				

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1 EXECUTIVE SUMMARY

This Ecologically Sustainable Development (ESD) Report has been prepared by E-LAB Consulting on behalf of Aqualand St Leonard Development Pty Ltd to support a State Significant Development Application (**SSDA**) SSD-88511459 for the site at 33 – 37 Herbert Street, St Leonards.

The Minister for Planning, or delegate, is the consent authority for the SSDA and this application is lodged with the NSW Department of Planning, Housing and Infrastructure (DPHI) for assessment.

This report presents a summary of the ESD strategies proposed and commitments made for the development. Aqualand is aiming to deliver a high-quality residential-led mixed-use development outcome for the site that demonstrates a strong commitment to sustainability in its design, construction, and operation.

As part of its commitment to sustainability, the development has committed to the following:

- 5.5-star NABERS Energy rating for Office spaces
- 3-star NABERS Water rating for Office spaces
- Achieving the BASIX benchmarks in line with State Environmental Planning Policy - Sustainable Buildings (SEPP) 2022 requirements for mixed-use residential building:
    - BASIX Energy 60%
    - BASIX Water 40%
    - Avg NatHERS rating of 7-star
- Complying compliance requirements for NCC/BCA Section J 2022 (or NCC 2025 as appropriate), including a performance façade and shading devices
- On-site renewable energy generation through spatial provision for rooftop solar photovoltaics (PV)
- Following a range of sustainability initiatives across the site spanning energy efficiency, water efficiency, indoor environment quality, waste management and comfort
- Implementing mitigation strategies in response to climate change and the Urban Heat Island Effect.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability in line with industry best-practice, and SEARS requirements and are to be further developed during subsequent stages of the project.

2 INTRODUCTION

This Environmentally Sustainable Design (ESD) report has been prepared to accompany State Significant Development Application (SSDA) SSD- 88511459 for the proposed development at 33 – 37 Herbert Street, St Leonards

The purpose of this report is to outline the proposed sustainability strategy and demonstrate how the development responds to relevant environmental performance objectives, planning controls, and regulatory requirements.

The application seeks development consent proposal Construction and operation of a part 13 storey and part 39 storey mixed use development.

2.1 DEVELOPMENT OVERVIEW

The SSDA seeks development consent for the following:

- Demolition of the existing buildings on site apart from the two-level, basement structure which is to be retained, adapted and reused for car parking;
- Site excavation, and other preparatory site works;
- Construction and operation of a part 13 storey and part 39 storey mixed use development comprising:
    - Approximately 413 dwellings including 46 affordable housing dwellings located on Levels 2 to 37 (excluding Level 4);
    - Shared amenities and landscaped communal open space on Level 4;
    - Approximately 5,918m2 of non-residential (commercial/ retail) GFA located on Ground and Level 1;
    - Car parking spaces within the basement and podium; and
    - Ground floor loading and servicing;
- Associated landscaping works; and
- Augmentation of utilities and infrastructure.
- Amend the Willoughby Local Environmental Plan (WLEP 2012) as follows:
- Rezone the subject site from E4 General Industrial to MU1 Mixed Use;
- Establish maximum height of RL 209.3m AHD;
- Amend maximum FSR from 1:1 to 7.15:1; and
- Establish non-residential FSR of 1:1.

2.2 SITE OVERVIEW

The site is located at 33-37 Herbert Street, St Leonards on Cammeraygal Country and is legally described as Lot 1 & 2 in DP 744175, Lot 3 in DP 772072, and Lot 1 in DP 115615. The site has an irregular shape with a total area of approximately 5,919m2, comprising two street frontages: a primary western frontage to Herbert Street of approximately 135m and a secondary northern frontage to Ella Street of approximately 65m.

The site is located in the Willoughby local government area (LGA), positioned 4.5km north of the Sydney CBD and 3km from the North Sydney CBD, with proximity to the centres of St Leonards and Chatswood. No. 33 Herbert Street is currently occupied by a three storey commercial building comprising retail and commercial office tenancies with basement parking, while No. 37 Herbert Street contains a single level retail showroom/warehouse building.

The site is in a highly accessible area, located approximately 400m walking distance from St Leonards train station and approximately 1km walking distance from the Crows Nest Metro station. The site benefits from its proximity to established commercial centres and excellent public transport connections, open space and critical health infrastructure.

The location of the site is illustrated in Figure 1.

- Aerial photo of site

Source: Urbis

2.3 BACKGROUND

On 15 November 2024, the NSW Government announced the creation of the Housing Delivery Authority (HDA) to accelerate the delivery of new homes and help meet the housing targets of the National Housing Accord. Following the establishment of the HDA, expressions of interest (EOI) opened on 8 January 2025.

The applicant submitted an EOI for an SSDA and concurrent rezoning proposal on 11 February 2025.

At its Briefing on 4 April 2025, the HDA recommended to the Minister that the applicant's project be declared SSDA, for the reason that it sufficiently satisfied the objectives and criteria of the HDA. The project was declared as SSD in the State Significant Development Declaration Order 2025 (No 5) (14 April 2025).

On 10 July 2025, the applicant submitted a Scoping Report requesting project-specific SEARs to progress the SSDA and concurrent rezoning pursuant to the successful EOI nomination and Minister's SSD declaration.

On 21 August 2025, DPHI issued the project-specific SEARs and Guidance for Concurrent Rezoning Report.

2.4 VISION FOR THE DEVELOPMENT

The principal objective of the proposed development is to provide well-located housing in response to the following:

- The well-publicised shortage of appropriate and affordable housing options;
- The well-publicised shortage of appropriate market housing options;
- Declining housing affordability and the increasing demand for all forms of housing; and
- A general shift towards sustainable higher density living closer to public transport and employment uses.

The proposal seeks to address these issues by providing additional housing in the strategically significant St Leonards Transit Oriented Development (TOD) precinct, which has transitioned to a high-rise, mixed-use

centre with residential uses as the primary function. Specifically, the key objectives of the proposed development are to:

- Respond to Sydney's housing challenges by delivering high quality market and affordable housing in a highly accessible TOD location with direct connectivity to St Leonards train station and Crows Nest Metro, contributing to NSW's affordable housing targets and the State Government's target for 47,800 new homes within transport hubs over the next 15 years;
- Optimise the development potential of this strategically located site, delivering a high-rise built form outcome consistent with the emerging character of the St Leonards centre;
- Deliver diverse housing typologies that respond to local market demand for different household types, tenures, and price points;
- Provide high quality, employment generating floor space within the podium levels;
- Deliver a high quality, contemporary, activated building that contributes to a vibrant and lively public domain and community;
- Incorporate a mixed-use approach integrating commercial, retail and residential land uses;
- Improve pedestrian and vehicular accessibility while encouraging direct connection to public transport and the existing street network; and
- Appropriately respond to neighbouring development and the public domain through podium and tower built form with appropriate setbacks and massing, protecting key views and minimising environmental impacts.

3 SUSTAINABILITY GOVERNING FRAMEWORKS & POLICIES

The proposed development's sustainability outcomes are influenced & aligned by the following key frameworks:

- Response to Secretary's Environmental Assessment Requirements (SEARS) issued for the development
- NSW Environmental Planning and Assessment (EPA) Regulation 2000
- State Environmental Planning Policy (SEPP) 2022 – Sustainable Buildings
- National Construction Code (NCC) 2022 – Section J Energy Efficiency
- Local Government Requirements**:
    - Willoughby Local Environmental Plan 2012 (WLEP 2012)
    - Willoughby DCP 2023 (DCP2023)

Although council provision does not technically apply to State Significant Development, it has been considered insofar as relevant to this proposal.

3.1 RESPONSE TO SEARS

This report outlines how the development will address the SEARs as part of the Environmental Impact Statement issued dated 21 August 2025 (SSD- 88511459).

Specifically, this report has been prepared to respond to the following SEARs:

Table 1 SEARS Response

SEARS REQUIREMENT	PROJECT RESPONSE
Identify how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development.	Refer to *Section 4* for details of development sustainability initiatives applicable to residential and non-residential portion of project. Refer to *Section 5* for details of Residential Compliance
Where relevant, provide an assessment of the development against the standards for non-residential development set out in Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022.	Refer to *Section 4* for details of development sustainability initiatives applicable to residential and non-residential portion of project. Refer to *Section 6* for details of non-residential Compliance.

3.2 EPA PRINCIPLES

The development will embed ecologically sustainable design principles throughout the design, construction, and operation of the development. The principles to which the development should generally adhere to are defined within Division 5 Section 193 of the Environmental Planning and Assessment Regulation 2021. These include:

Table 2 EPA Principles

ESD PRINCIPLES	PROJECT RESPONSE
(a) **The precautionary principle**, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application **of the precautionary principle**, public and private decisions should be guided by— i. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and ii. an assessment of the risk-weighted consequences of various options,	*The project will employ relevant environmental protection measures and risk assessments to ensure no irreversible environmental harm is acted as a result of the construction or operation of the development.* *During construction, it is intended the main contractor will implement an independently certified Environmental Management System (EMS) that will demonstrate a formalised systematic and methodical approach to planning, implementing and auditing for environmental management. During operation, adherence to procedures that account for environmental risk and mitigation measures will be met.*
(b) **Inter-generational equity**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,	*The design team will address key elements such as energy, potable water and material use to do all which is within the project's control to ensure future generations have equal opportunity and access to the environment. Refer Section 4.*
(c) Conservation **of biological diversity and ecological integrity**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,	*The site can be considered to have low-ecological value and biodiversity significance as it is already developed and within an urban area.* *In response to this, the project is committed to planting a high proportion of native vegetation to improve site ecology and biological diversity, while also managing stormwater runoff from the site to minimise onset impacts.*
(d) **Improved valuation, pricing and incentive mechanisms**, namely, that environmental factors should be included in the valuation of assets and services, such as— i. polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, ii. the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,	*The project is committed to achieving a high construction waste diversion target of 90% from landfill as well as developed specific project waste management strategies. The project shall ensure the full life cycle impacts of goods and services employed throughout the project have been considered. Further, it will be designed to minimise operational energy and water consumption.*

ESD PRINCIPLES	PROJECT RESPONSE
iii. environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems	

3.3 STATE ENVIRONMENTAL PLANNING POLICY (SEPP) SUSTAINABLE BUILDINGS 2022

NSW has whole-of-economy targets to reduce greenhouse gas emissions by 50 per cent by 2030 compared to 2005 levels, and net zero emissions by 2050. Achieving these targets will require all new and existing buildings in NSW to be operating at net zero well before 2050. Energy efficiency, conserving potable water and improving thermal performance are also high priorities.

The NSW Government has introduced the State Environmental Planning Policy (Sustainable Buildings) SEPP 2022 to ensure new and renovated buildings are sustainable and resilient for future climate and bring NSW towards net zero emissions. This policy covers each component of the proposed development.

3.3.1 NSW RESIDENTIAL BUILDINGS

The Building Sustainability Index (BASIX) is a legislative requirement for all residential dwelling types within NSW to assess the potential performance of certain residential buildings against a range of sustainability indices including thermal comfort, water, embodied emission and energy.

BASIX sets water and greenhouse gas reduction targets relative to the NSW average benchmark for per person potable water consumption & greenhouse gas emissions within the residential sector. It also sets the minimum performance levels for thermal comfort of the dwelling and the embodied carbon emissions that are attributable to building materials.

The residential component of this project is committed to meet requirements in line with the State Environmental Planning Policy – Sustainable Buildings (SEPP) 2022 at the time of delivery:

Table 3 BASIX Targets Under SEPP 2022

Benchmark	REQUIREMENT
Energy Benchmark	Required to achieve 63% reduction in energy consumption of whole development through energy efficient design.
Water Benchmark	Required to achieve 40% reduction in water consumption of whole development through water efficient design.
Thermal Performance	Meet Thermal Comfort benchmarks • Minimum NatHERS rating of 6 stars individual unit • Average NatHERS rating of 7 stars whole development
Materials Index	Required to estimate the volume of different materials used in the construction and applying the emissions factors for the materials.

Please refer to the Section 4 and Section 5 of this report and BASIX Report submitted with this application for further details on BASIX compliance.

3.3.2 NSW NON-RESIDENTIAL DEVELOPMENT

The Sustainable Buildings SEPP 2022 sets general performance for the non-residential component of the development, and development require to reporting on key sustainability metrics and operational aspects including:

Part	Requirement	Response
1(a)	Minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials,	Refer Section 4.5 highlighting a 90% diversion rate of construction and demolition waste from landfill.
1(b)	Reduction in peak demand for electricity, including through the use of energy efficient technology,	Refer Section 4.2 which discusses reduction in electricity and energy through efficient systems and monitoring.
1(c)	Reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design,	Refer Section 4.2 for energy efficiency initiatives.
1(d)	Generation and storage of renewable energy,	Solar PV generation potential to be investigated and incorporated into the design.
1(e)	Metering and monitoring of energy consumption,	Refer Section 4.2 discussing energy metering and monitoring requirements for the development.
1(f)	Minimisation of the consumption of potable water.	Refer Section 4.3 discussing the efficient systems in place to minimise water use and the strategies in place to recycle water throughout the development.
2	Net Zero Statement demonstrating pathway to net zero operation / fossil-fuel-free operation by 2035.	Applicable only to large commercial and certain SSDA projects. Refer Section 6 and Net Zero Statement prepared by E-LAB.
3	Energy Performance and Offset large commercial development must commit to 5.5 Star NABERS Energy	Applicable only to large commercial and certain SSDA projects. Refer Section 6 for details.
4	Water Performance large commercial development must commit to 3 Star NABERS Water	Applicable only to large commercial and certain SSDA projects. Refer Section 6 for details.
5	Quantification of the embodied emissions attributable to the development using the NABERS tool disclosed at development application and construction certificate stages.	The development will declare materials for embodied emissions reporting through the NABERS Embodied Emissions Reporting form.

3.4 LOCAL GOVERNMENT REQUIREMENT

Willoughby Local Environmental Plan 2012 & Willoughby Development Control Plan 2023

The Willoughby Local Environmental Plan 2012 provides the statutory planning framework for development within the Willoughby local government area, including land use zoning, built form controls, environmental protections and local planning provisions. Council describes the LEP as the statutory framework for planning, development and building in the area. The Willoughby Development Control Plan 2023 supplements the LEP and State planning controls by providing more detailed design and environmental guidance. Relevant sections of the DCP, including Part J: Building Sustainability, promote energy-efficient buildings with low greenhouse gas emissions, reduced waste, renewable energy and alternative water supply, improved occupant comfort and health, and responsible resource use. Together, the LEP and DCP establish an integrated sustainability framework that guides development towards strong environmental performance, improved liveability and alignment with Council's broader planning objectives.

Provision	Sustainability Intent	Project Response
LEP Clause 1.2 – Aims of the Plan	Support orderly development, environmental protection and high-quality planning outcomes across Willoughby.	The proposal incorporates passive design, efficient services, water-sensitive design and improved environmental performance consistent with the broader aims of the planning framework.
LEP Zone Objectives	Encourage land uses and built form outcomes that are compatible with local character, amenity and sustainable urban development.	The development responds to the site context through an efficient built form, improved pedestrian accessibility and a design approach that supports reduced operational impacts.
LEP Height / FSR / Built Form Controls	Manage building scale and density while protecting amenity and minimising adverse environmental impacts.	The design considers daylight access, solar control, natural ventilation, façade performance and building form to improve occupant comfort and reduce energy demand.
DCP Part J – Building Sustainability	Improve the design of buildings to achieve sustainable and energy-efficient outcomes with low greenhouse gas emissions; reduce waste; encourage renewable energy and alternative water supply; improve comfort, health and wellbeing; and reduce natural resource consumption.	The proposal adopts passive solar design, high-performance building fabric, efficient services, durable materials and opportunities for improved operational performance over the life of the building.
DCP – Energy Efficiency & Thermal Comfort	Reduce operational energy demand and improve indoor environmental quality through better design and fabric performance.	High-performance glazing, shading, insulation and an optimised façade treatment are incorporated to improve thermal comfort and reduce heating and cooling loads.
DCP – Water Efficiency & Stormwater / Alternative Water Supply	Encourage reduced potable water use and better stormwater outcomes through efficient fixtures and alternative water measures.	Water-efficient fixtures, rainwater reuse opportunities and stormwater quality measures are incorporated to reduce potable water demand and improve site water management.
DCP – Waste & Durable Design	Reduce waste generation and support adaptable, durable and low-maintenance design outcomes.	Waste storage areas are designed to support efficient recycling and waste handling, while durable materials are selected to support long-term building performance.
DCP – Landscaping / Deep Soil / Urban Ecology	Improve canopy cover, landscape quality, biodiversity and site microclimate.	Deep soil planting where feasible, tree retention/protection and additional planting contribute to shade, amenity and improved ecological value.

DCP – Sustainable Transport / Access	Support walking, cycling, public transport use and reduced reliance on private vehicles through good site planning and access arrangements.	Secure bicycle parking, safe pedestrian access and integration with surrounding transport infrastructure support more sustainable travel patterns.
DCP – Amenity / Built Form / Streetscape	Ensure development contributes positively to local character, environmental quality and residential amenity.	The proposal adopts a context-responsive built form that considers privacy, acoustic comfort, daylight, landscape interface and overall occupant amenity.

Part 4 – Principal Development Standards

3.5 NATIONAL CONSTRUCTION CODE (NCC) 2022 - SECTION J (ENERGY EFFICIENCY)

The development requires to ensure the energy use of designed building adheres to the relevant minimum performance requirements as set out within Section J of the NCC, 2022. The development will manage energy use/GHG emissions whilst maintaining a high degree of human comfort through the use of high-performance thermal fabric elements and efficient building service equipment.

4 SUSTAINABLE DESIGN RESPONSE

4.1 SUSTAINABLE DESIGN INITIATIVES

Sustainable building design adopts a holistic and integrated approach, informed by a detailed understanding of site opportunities, building form, and functional requirements. Achieving a low-carbon economy and contributing to a "2°C world," in which average global temperatures are limited to less than 2°C above pre-industrial levels, requires comprehensive consideration of how a development consumes resources.

In response, the proposed development has been assessed against the following key sustainability focus areas:

- Energy Consumption
- Water Consumption
- Materials and Resources
- Waste Management
- Indoor Environmental Quality
- Sustainable Transport
- Climate Resilience and Heat Island Mitigation
- Governance, Performance and Monitoring

These focus areas collectively address operational efficiency, occupant wellbeing, resource stewardship, and long-term environmental resilience. The approach is aligned with relevant Environmental Sustainable Design (ESD) frameworks, policies, and statutory requirements outlined in Section 3 of this report.

The following figure illustrates the overall sustainability strategy proposed for the development and demonstrates how these key initiatives are integrated to deliver improved environmental performance and long-term sustainability outcomes

4.2 ENERGY CONSUMPTION

The energy efficiency strategy generally follows the energy efficiency pyramid of the design below. In the first instance demand for Greenhouse Gasses should be reduced. Consideration should be to remove the need for energy to be consumed where possible. Beyond this, energy can be more efficient, through efficient lighting, mechanical systems and appropriate services.

Once the system has reduced all available energy-consuming elements and made the remaining systems as efficient as possible, renewable energy sources will be considered. If space allows on the roof, PV will be installed. Only after all of the above major steps have been completed should offsets be used to close the gap and achieve neutrality.

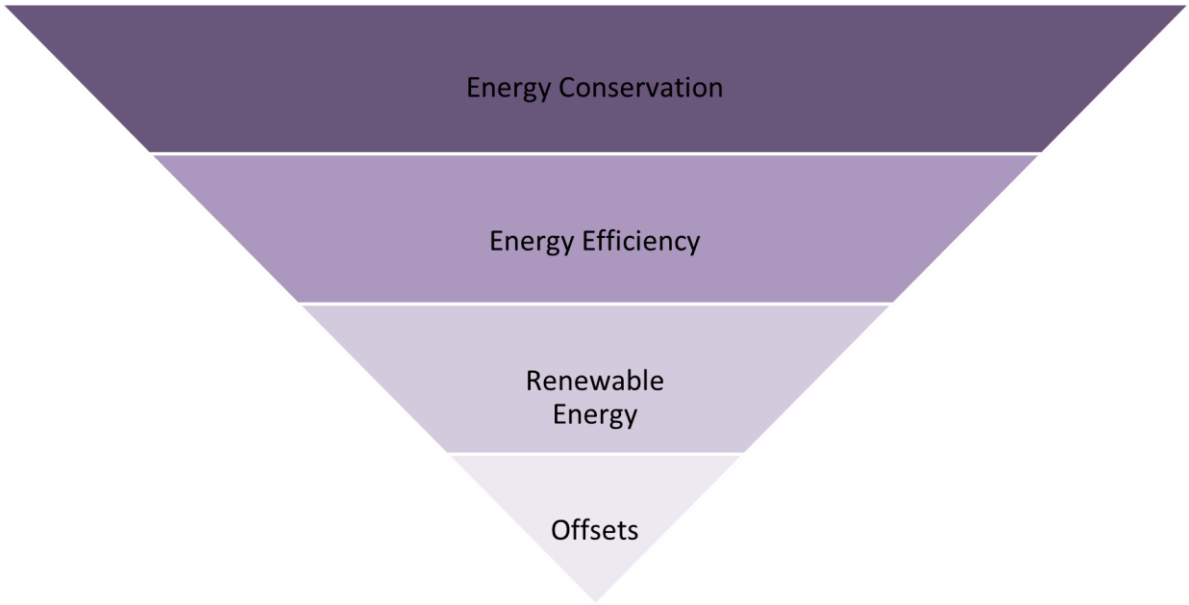
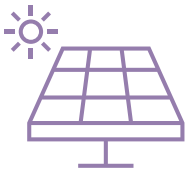


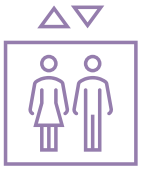
Figure 1 Hierarchy of Design - Energy Efficiency

To achieve the above, the following initiatives are proposed:

Passive Design Optimisation –Incorporating the passive design measures to enhance occupant comfort and reduce operational energy demand is the key target for the development. A high-performance building façade will be utilised to balance daylight access with the control of solar heat gains through optimised glazing selection, façade articulation, and shading strategies. Building orientation, window-to-wall ratios, and internal planning will be refined during design development and tested through building energy modelling. In addition, best-practice envelope sealing and quality assurance measures will be implemented to minimise uncontrolled air infiltration, improving thermal performance and overall building efficiency.



Renewable Energy – The roof area provides an excellent opportunity for installation of a solar photovoltaic system. The sizeable system will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area. The detailed design specifications and final placement of the photovoltaic panels will be confirmed prior to the commencement of construction. This approach is considered standard and acceptable at this stage of the project lifecycle, particularly for developments of this scale and complexity.



High-Efficiency Lifts with Regenerative Drives – Energy-efficient lift systems incorporating regenerative drive technology will be provided. These systems capture and reuse energy generated during braking and descending movements, reducing overall lift energy consumption. Lift operation and controls will be optimised to minimise standby energy use and support improved whole-of-building energy performance

Efficient Lighting Systems – High-efficiency LED lighting will be provided throughout the building and designed to comply with NCC 2022 Section J lighting power density requirements. Energy-efficient lighting controls, including occupancy sensors, time scheduling, zoned switching and daylight control where appropriate, will be incorporated to minimise unnecessary energy consumption while maintaining occupant comfort and safety.

Controls, Energy Metering and Monitoring – Energy metering and monitoring systems will be provided in accordance with NCC 2022 Section J, Part J8, and relevant NABERS requirements. Sub-metering will be incorporated to enable accurate measurement, validation, and monitoring of energy consumption across major building services and tenancy areas. These systems will support ongoing performance tracking, energy management, and operational optimisation throughout the life of the building.

High-Efficiency HVAC Systems - high-efficiency, all-electric heating and cooling systems (e.g. air cooled VRF or high-efficiency reverse-cycle systems) with high COP/EER values will be provided. Systems to be zoned and controlled to minimise energy use during unoccupied periods and improve thermal comfort.

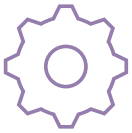
Mechanical systems will utilise refrigerants with low global warming potential (GWP) where practicable, reducing embodied and operational carbon impacts associated with refrigerant leakage.

Hot Water – Hot water will be provided by a high-efficiency gas system. The system is designed to reduce energy consumption while allowing occupants to access reliable and efficient hot water service.

Appliances & Equipment – all appliances and equipment will be selected with high energy rating to ensure reduced consumption which will be in line with BASIX energy targets requirements.

Low Emission Transportation – To encourage low-emission transport alternatives bicycle parking and ancillary end-of-trip facilities as applicable shall be provided. Pedestrian access to nearby public transport networks such as bus and rail will be maximised.

Electric Vehicle (EV) Charging Infrastructure - Provision of EV charging infrastructure or future-ready provisions (conduits and capacity allowances) to support low-emission transport and future electrification needs in advance to NCC 2022 requirements.



Commissioning & Building Tuning – project will have commissioning and post-occupancy tuning of building services to verify design intent, ensure systems operate efficiently, and support performance outcomes.

4.3 WATER CONSUMPTION

To achieve responsible water consumption and water sensitive urban design, best-practice water-saving initiatives will need to be implemented throughout the project. The development's design is deliberately working to reduce potable water consumption in the first instance by reducing water use.

The following initiatives will be explored to achieve the potable water targets:

Sanitary Fixtures – By implementing low-flow water fixtures throughout the development, the consumption will be significantly reduced. All sanitary fixtures are to be provided with the minimum WELS ratings identified below:

Taps – 4 Star WELS

Toilets – 4 Star WELS

Showers – 4 Star WELS

Refer to the BASIX report for further details on residential water consumption measures.

Rainwater Harvesting – The development will provide a rainwater storage tank with reuse supplied to landscape irrigation, reducing reliance on mains supply water. Final sizing of the tank and detail regarding collection considering the catchment area, expected demand and pumping infrastructure is to be refined during detailed design stages.

Landscape Irrigation – Efficient irrigation systems will be considered, including underground surface drip systems, moisture sensors, and the use of native plants in the landscaping plan. Native plants have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts. They typically require less water and are more likely to survive the predicted increase in extreme drought conditions due to climate change. Native vegetation also stores a significant amount of carbon, helping to mitigate climate change. The project is targeting a 70% native planting palette.

WSUD & Stormwater Management –Stormwater quality (pollutant loading) and volume discharged from site are key considerations in future design stages to ensure the development has minimal environmental impact on local waterways and ecology compared to the pre-development baseline.

4.4 MATERIALS & RESOURCES

In line with the principals of sustainability outlined in the EPA, the project will have a significant focus on materiality. The scope of consideration includes the following action items within the project response:

- **Low VOC and Low Formaldehyde Materials** – paints, adhesives, sealants, floor coverings, carpets and engineered wood will be selected appropriately to provide a healthier and low-impact environment. Such efforts provide a cleaner and better environment for all. Additionally, the project will aim to utilise ultra-low VOC paints.
- **Best-Practice PVC** – cables, pipes, flooring, and blinds will be selected and specified to be Best Practice PVC. This ensures upstream performance will be met and has significant benefit for the overall environment during the construction process.
- **Best Practice Steel** – Where possible, steel will come from a sustainable steel manufacturer, who has an action plan. Steel supplied will aim to have energy reducing processes in manufacturing and recycled content.
- **Sustainable Products** – Where possible, products selected for the project will be sustainable which are verified through recycled content, re-use, environmental product declarations, certifications and more. This will ensure reduced toxicity and improve environmental quality while reducing waste.

4.5 WASTE MANAGEMENT

4.5.1 CONSTRUCTION WASTE

Construction and demolition waste recovery has significantly improved in recent years, with traditional landfill facilities increasingly operating as resource recovery centres capable of recycling the majority of construction waste streams.

The development is targeting a minimum of 90% diversion of construction and demolition waste from landfill. Waste management performance will be reinforced through contractual requirements placed on contractors, including the implementation of waste separation strategies and engagement with appropriately licensed waste collection and recycling facilities.

4.5.2 OPERATIONAL WASTE

Operational waste generated through day-to-day building use will be minimised through effective waste segregation and management practices. An Operational Waste Management Plan will be developed to support ongoing waste reduction and recycling during building operation.

Waste streams are anticipated to primarily include general waste and paper/cardboard recycling, with provision for additional recyclable streams where practicable. Waste facilities will be appropriately sized and conveniently located to encourage correct waste separation and maximise recycling participation by occupants. Bin locations will be aligned with areas where specific waste streams are most likely to be generated, supporting efficient collection and ongoing operational effectiveness

4.6 INDOOR COMFORT AND ENVIROMENTAL QUALITY

To ensure the best quality for occupants and visitors inside the space, the following key initiatives will be committed to by the principal:

- **Visual Comfort** – Maximising high-quality light into the living spaces, with high amenity views.
- **Indoor Air Quality** – Ventilation to be easily cleaned and elimination of pollutants to improve air quality within internal spaces.
- **Acoustic Excellence** – Designing the building layout to be protected from noise from external sources. Delicate material selection, acoustic attenuation, and designing the shape of the building and openings accordingly achieves the performance. High-performance glazing specifications will be implemented to further manage street-level noise emissions.
- **Thermal Comfort** – Appropriate mix of vernacular design, overhangs, adaptive comfort and high levels of insulation in the roof and facades.
- **Lighting Comfort** – Use of high colour rendering index (CRI > 85) LED lighting throughout the entire development. Low-glare lighting with baffles or louvres to limit glare.
- **Biophilic Design –** Natural elements that reflect the context of the site and acts as a connection to nature for occupants.
- **Accessibility –** Ensure that the building is accessible to people of all abilities, in accordance with AS 1428, with features such as ramps.
- **Safety and Security –** Prioritise building safety and security measures to provide a sense of comfort and protection for occupants.
- **Natural Materials –** Where practical, use natural and sustainable building materials that are non-toxic and promote a healthy indoor environment.

The above combine to ensure the development is responsible, efficient, beautiful, and in the best interest of not just the developers, but the residents as well.

4.7 SUSTAINABLE TRANSPORT

The adoption of sustainable transport methods is encouraged through building designs that provide appropriate facilities for occupants and visitors. The site's proximity to major public transport infrastructure and walkable access to surrounding services and amenities supports the use of public and active transport, helping to reduce reliance

on private vehicles. The development at 33–37 Herbert Street, St Leonards benefits from strong transport connectivity, being located approximately 400 metres walking distance from St Leonards Station and approximately 1 kilometre walking distance from Crows Nest Metro Station. The site is also close to bus services along Pacific Highway, with routes including 114, 144, 252, 254 and 291, providing convenient access to surrounding centres and the wider Sydney metropolitan network. In addition, the area is supported by existing and planned bicycle connections, including the Pacific Highway shared path linking Chatswood and Herbert Street. These characteristics create strong opportunities for residents and visitors to adopt sustainable transport choices.

- **Bicycle Parking Facilities**: Secure and convenient bicycle parking is provided for residents and visitors, supporting active transport and reducing localised car trips.
- **Enhanced Pedestrian Access**: The site layout promotes safe, direct and legible pedestrian movement to Herbert Street, Pacific Highway, nearby local services and surrounding public transport nodes, encouraging walking as a primary mode of transport.
- **Proximity to High-Frequency Public Transport:** Easy access to St Leonards Station, nearby bus services on Pacific Highway, and connections to Crows Nest Metro Station provide efficient links to major employment centres including the Sydney CBD, North Sydney, Chatswood, Macquarie Park and other metropolitan destinations, reducing dependence on private vehicles

4.1 CLIMATE RESILIENCE AND HEAT ISLAND MITIGATION

The development has been designed to respond to local climatic conditions and mitigate the impacts of climate change in accordance with relevant council DCP objectives and the intent of the SEPP Sustainable Buildings framework. The design seeks to reduce exposure to extreme heat, improve outdoor amenity, and enhance long-term resilience through integrated urban design and landscape strategies.

The site experiences a moderate to high Urban Heat Island effect relative to surrounding areas, with heatwave temperature peaks of **approximately 5.97°C** above baseline conditions, as identified by NSW Government SEED mapping. (https://www.seed.nsw.gov.au/).

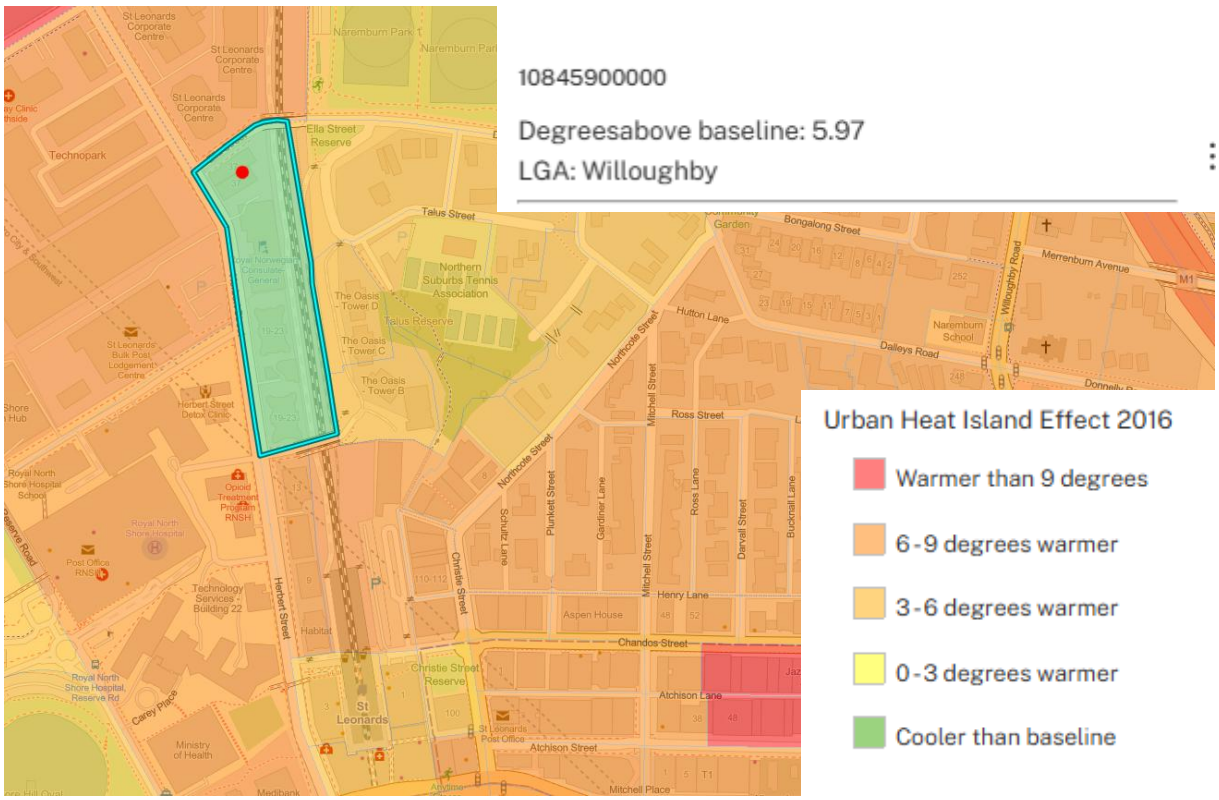


Figure 2: Urban Heat Island Effect at the site (Source: SEED Database, 2016)

The development incorporates climate-responsive design measures to mitigate urban heat island impacts, improve outdoor comfort, and enhance resilience to future climate conditions. Design responses consider increased temperatures and heatwave events and aim to reduce heat build-up across the site.

Development can implement the following initiatives:

- Urban greening strategies include the retention and provision of trees and landscaped areas to increase canopy cover and provide shade to communal and pedestrian spaces. Landscaped open spaces and planting will contribute to improved microclimate conditions and outdoor amenity.
- Light-coloured and heat-reflective materials will be used where practicable to roofs, façades, and external paved areas to minimise heat absorption. Building form and façade articulation will be designed to reduce direct solar exposure and improve thermal comfort.
- Water-sensitive landscape design and efficient irrigation will support vegetation health during warmer periods. Collectively, these measures will reduce localised heat impacts, improve occupant comfort, and support a resilient and sustainable development outcome.
- Incorporation of architectural elements and shading features, such as overhangs and façade articulation, to limit direct solar exposure and enhance thermal comfort.

4.2 NSW NET ZERO GOAL

The development is aligned with the NSW Government's objective of achieving net zero greenhouse gas emissions by 2050 through the implementation of a range of energy and carbon reduction strategies outlined in this report. The approach to decarbonisation follows a reduction-first, outcomes-based hierarchy, prioritising the avoidance and reduction of emissions before transitioning to cleaner energy sources.

This approach includes the following principles:

- **Avoid** – Identify and eliminate carbon-intensive activities and energy sources where practicable.
- **Reduce** – Lower the carbon intensity of remaining energy use through improved design, technology, and system efficiency.
- **Transition** – Support the transition to renewable electricity and low-emissions energy sources.

In accordance with this hierarchy, the development will incorporate a range of strategies to minimise operational greenhouse gas emissions, including:

- Selection of **HVAC systems with low-impact refrigerants** and energy-efficient plant and equipment to reduce emissions associated with building services.
- **Reduction of energy demand through passive design measures**, including architectural shading and façade projection elements to limit solar heat gain, improved thermal performance of the building envelope, and the provision of cross-ventilation opportunities to support natural cooling where appropriate. Naturally ventilated corridors and circulation spaces will be utilised to reduce reliance on mechanical ventilation and air-conditioning.
- **High-performance façade design**, including optimised glazing and insulation selection, supporting an average apartment thermal performance target of approximately 7-Star NatHERS, thereby reducing energy demand for heating and cooling.
- **Efficient lighting systems and controls**, including time clocks, zoned switching, and occupancy sensors, to minimise unnecessary energy use. Metering, monitoring, and control systems will support ongoing energy performance tracking and operational optimisation.

Where feasible, **on-site renewable energy systems** will be incorporated and coordinated with building services design to further reduce reliance on grid electricity and support long-term emissions reduction.

Collectively, these measures support the NSW Net Zero 2050 target by reducing operational energy demand, lowering emissions intensity, and enabling future decarbonisation as the electricity grid continues to transition to renewable source.

5 RESIDENTIAL COMPLIANCE

The Building Sustainability Index (BASIX) is a statutory requirement for residential development in New South Wales and is used to assess the sustainability performance of proposed dwellings against key criteria including energy efficiency, water consumption, thermal comfort, and embodied emissions.

BASIX establishes minimum performance targets relative to NSW average benchmarks for per-person potable water consumption and residential greenhouse gas emissions, and sets minimum standards for thermal performance and material-related embodied emissions.

The project is committed to meeting BASIX requirements applicable at the time of construction and delivery, in accordance with SEPP Sustainable Buildings Legislation (2022). The development is designed to achieve the following minimum performance targets:

- **Energy Target:** Required to achieve minimum 60% - 63% reduction in energy consumption of whole development through energy efficient design.
- **Water Target:** Required to achieve 40% reduction in water consumption of whole development through water efficient design.
- **Thermal Performance Target**: The development is require achieving average 7-star NatHERS under SEPP 2022 requirements.
- **Materials Index:** Required to estimate the volume of different materials used in the construction and applying the emissions factors for the materials.

5.1 BASIX ENERGY TARGET

The residential energy strategy has been developed to minimise operational energy demand, reduce greenhouse gas emissions, and support compliance with BASIX and the State Environmental Planning Policy – Sustainable Buildings (SEPP) 2022.

The strategy follows a reduction-first hierarchy, prioritising passive design, efficient building fabric, and renewable energy generation before considering operational controls and monitoring.:

BASIX Building Sustainability Index	**BASIX Energy Target of 60%** In line with SEPP Sustainable Buildings (2022) and relevant council sustainability objectives, the development is targeting a BASIX Energy reduction of approximately 61–63% compared to an equivalent benchmark development.
	**Passive Cooling and Natural Ventilation** Passive cooling strategies will be incorporated to reduce reliance on mechanical systems, including: • Cross-ventilation opportunities within apartments where layout allows. • Naturally ventilated corridors and circulation spaces to reduce the need for mechanical ventilation.
	**Energy Efficient Appliances** Energy-efficient appliances will be specified within apartments, including cooktops, ovens, and clothes dryers, selected to support reduced operational energy consumption and BASIX compliance. Where applicable, appliances with high energy ratings will be prioritised.

	**Efficient Lighting Systems** High-efficiency LED lighting will be installed throughout residential and common areas. Lighting design will minimise lighting power density and incorporate energy-saving controls such as: • Occupancy and motion sensors in common areas • Time clocks for shared and external lighting • Zoned switching to limit unnecessary lighting operation Lighting systems will be designed to comply with NCC 2022 Section J requirements.
	**Renewable Energy Generation** The roof design provides an opportunity for the installation of a solar photovoltaic (PV) system to generate on-site renewable electricity. The PV system will offset grid electricity consumption and reduce peak demand impacts. The design team will seek to maximise PV capacity, with final system size and layout to be confirmed during detailed design based on roof configuration, available area, and building demand.
	**Controls, energy metering and monitoring** Energy metering and monitoring systems will be provided in accordance with **NCC 2022 Section J** enabling monitoring of energy consumption across key building services. These systems will support efficient operation, performance tracking, and future optimisation.
	**Efficient Hot water Systems** Domestic hot water will be provided via high-efficiency gas storage.
	**Efficient HVAC Systems** High-efficiency, heating and cooling systems will be provided to residential dwellings and common areas to minimise operational energy consumption. Systems will be selected for high efficiency performance and appropriately sized to suit the thermal characteristics of the building. Zoning and user controls will be incorporated to limit energy use to occupied areas only, reducing unnecessary operation while maintaining occupant comfort**.**
	**Efficient Pool Heating System** Where pool heating is required, it will be provided via a high-efficiency electric heat pump system. Heat pump pool heating systems offer significantly higher efficiency compared to conventional electric or gas-fired systems by extracting ambient heat from the air. The system will be designed to operate efficiently and, where feasible, align with on-site solar photovoltaic generation to further reduce operational energy consumption and associated carbon emissions. Pool circulation and filtration systems will also be selected for energy efficiency, including variable-speed pumps, to minimise ongoing energy use.

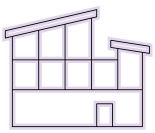
5.2 BASIX WATER TARGET

The project will target minimum **BASIX Water target of 40%,** meeting the minimum legislative requirement. To achieve responsible water consumption, the best practice water-saving initiatives will need to be implemented throughout the project. The following initiatives will be explored to achieve the potable water targets:

	**Sanitary Fixtures** By implementing low-flow water fixtures, the consumption associated with apartments will be significantly reduced. All sanitary fixtures are to be provided to the WELS ratings identified below: ▪ Taps – 4 and 6 Star WELS ▪ Toilets – 4 Star WELS ▪ Showers – 4 Star WELS (<=6 L/min)
	**Landscape Irrigation** Efficient irrigation systems will be considered, including underground surface drip systems, moisture sensors, and the use of native plants in the landscaping plan. Natives have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts. Native vegetation also stores a significant amount of carbon, mitigating the impacts of climate change.
	**Rainwater Harvesting** The development will provide a rainwater storage tank with reuse supplied to landscape irrigation, reducing reliance on mains supply water. Final sizing of the tank and detail regarding collection considering the catchment area, expected demand and pumping infrastructure is to be refined during detailed design stages.
	**Water Efficient Appliances** Water efficient appliances with low-flow and High WELS ratings will be provided to reduce potable water consumption.

5.3 THERMAL COMFORT TARGET

The residential component is designed to achieve an average minimum 7-Star NatHERS rating, with no individual dwelling below 6 Stars, in accordance with SEPP Sustainable Buildings (2022). The following design strategies are proposed to support these thermal performance outcomes:

	**Building Orientation and Apartment Layout** Apartments and living spaces are arranged to optimise winter solar access while limiting excessive summer heat gain, reducing heating demand and supporting stable internal temperatures year-round.
	**High-Performance Building Envelope** The building envelope will be designed to enhance thermal performance and minimise heating and cooling loads. This includes: • Insulation to roofs, external walls, and floors in accordance with or exceeding NCC minimum requirements. • Effective air sealing and construction detailing to reduce uncontrolled bulk air infiltration. • Use of light-coloured and low-heat-absorption external materials where practicable. • Careful consideration of window placement, glazing performance, shading devices, and window-to-wall ratios to balance daylight access with control of solar heat gains and losses

	Optimised Glazing and Window-to-Wall Ratios High-performance glazing is selected with appropriate thermal properties, and window sizes and placement are carefully considered to balance daylight access with control of heat gain and loss, supporting internal comfort and NatHERS performance outcomes.
	Natural Ventilation and Cross-Ventilation Where feasible, apartments are designed to allow natural ventilation and cross-ventilation, enabling passive cooling during suitable conditions and reducing reliance on mechanical air-conditioning.
	Reduction of Thermal Bridging Construction detailing considers the reduction of thermal bridging at key junctions to limit unwanted heat transfer and improve overall thermal performance of the building envelope

Collectively, these measures reduce heating and cooling demand, improve year-round thermal comfort, and enable the development to achieve the targeted average 7-Star NatHERS rating, with a minimum 6-Star rating across all dwellings.

5.4 MATERIALS INDEX

Material Index commitment involves sourcing and utilizing construction materials that have a lower environmental impact, thereby reducing the carbon footprint associated with the project's construction and operation. This approach aligns seamlessly with the principles of the State Environmental Planning Policy – Sustainable Buildings (SEPP) 2022 SEPP 2022, demonstrating the development's dedication to sustainable construction practices. In line with the principals of the State Environmental Planning Policy – Sustainable Buildings (SEPP) 2022 for BASIX, the project will have a significant focus on materiality to reduce the embodied emission.

6 NON-RESIDENTIAL COMPLIANCE

6.1 AGREEMENT TO RATE - NABERS ENERGY AND WATER (OFFICE)

For compliance with the State Environmental Planning Policy (Sustainable Buildings) 2022, prescribed office premises with a net lettable area of at least 1,000 m² are required to achieve minimum operational performance targets of 5.5 Star NABERS Energy and 3 Star NABERS Water.

Accordingly, the office component of this development is required to achieve the following minimum ratings:

- 5.5 Star NABERS Energy
- 3 Star NABERS Water

The proposed strategy to achieve these targets includes identifying the preferred Section J compliance pathway, incorporating appropriate energy efficiency and water-saving measures into the building design, and submitting the required NABERS Commitment Agreement and Agreement to Rate documentation as part of the development application. These measures will support the delivery of a high-performing commercial building with reduced operational energy and water consumption.

6.2 NABERS EMBODIED EMISSIONS REPORTING

In accordance with the State Environmental Planning Policy – Sustainable Buildings (SEPP) 2022, reporting of embodied emissions is required for the non-residential components of the development, including retail and commercial areas. Embodied emissions disclosure will be undertaken using the NABERS Embodied Emissions Material Form, consistent with NSW Government requirements.

The assessment focuses on the greenhouse gas emissions associated with the manufacture, transport, and installation of key construction materials. While this stage of the project is limited to reporting rather than performance targets, the development seeks to align with best-practice principles to reduce embodied carbon where practicable.

The following initiatives have been identified to support the reduction of embodied emissions across the development:

Use of salvaged and recycled materials where feasible to reduce reliance on virgin materials and associated emissions.

Optimisation of structural and building systems to improve material efficiency and reduce overall material quantities.

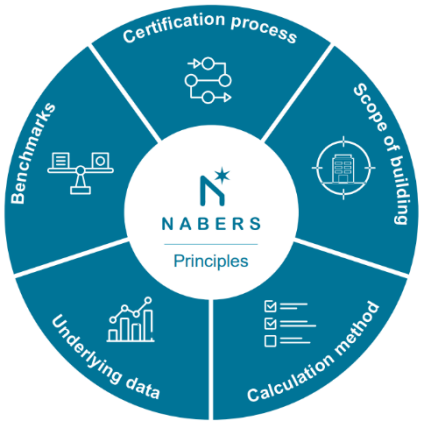
Specification of low-carbon concrete, including the use of supplementary cementitious materials where available and appropriate.

Selection of materials that naturally sequester carbon, such as timber and other bio-based materials, where suitable for the application.

Preference for materials manufactured using renewable energy, subject to availability and supplier information.

Design for durability and longevity, reducing the need for premature replacement and associated future emissions.

Engagement with the supply chain to better understand material sourcing, manufacturing processes, and embodied emissions profiles.



6.3 NET ZERO STATEMENT

For compliance with the State Environmental Planning Policy (Sustainable Buildings) 2022, prescribed office premises with a net lettable area of at least 1,000 m² must be accompanied by a Net Zero Statement. The statement must demonstrate that the development will either operate without on-site fossil fuels from commencement of occupation or be designed with sufficient space and infrastructure to enable operation without on-site fossil fuels by 1 January 2035.

Accordingly, the office component of this development is required to submit a Net Zero Statement as part of the development application. The proposed strategy is to confirm the building's fossil fuel approach, identify the relevant building services and plant strategy, and document the infrastructure and spatial allowances necessary to support compliance with the net zero statement requirement.

6.4 SECTION J

The proposed non-residential component of the development will be required to comply with the energy efficiency provisions of NCC 2022, Section J. Section J sets minimum environmental performance requirements for building fabric and building services, including the thermal performance of the envelope, lighting, mechanical systems, and associated controls.

Compliance with Section J will be demonstrated at the appropriate stage of the project, either through the Verification Method J1V3 (energy modelling against a reference building) or via the Deemed-to-Satisfy (DtS) provisions, subject to final design development. Where the Verification Method is adopted, the building fabric and services design will be assessed through dynamic thermal modelling and compared against a reference case in accordance with NCC requirements.

The final compliance pathway and supporting documentation will be confirmed and submitted prior to construction to demonstrate full compliance with NCC 2022 Section J.

7 RECOMMENDATIONS AND MITIGATION MEASURES

This section outlines the recommended sustainability initiatives and mitigation measures required to manage the environmental impacts identified throughout the assessment. The purpose of this section is to clearly document how the development responds to potential risks related to energy performance, water consumption, thermal comfort, operational efficiency, and broader environmental outcomes. Each mitigation measure is presented with defined responsibilities and implementation timeframes to ensure clarity for future consent conditions and to support effective coordination during design, construction, and occupation phases. These measures collectively demonstrate the project's commitment to achieving best-practice environmental performance and meeting all relevant BASIX, SEPP, and local planning requirements.

Potential Impact	Mitigation Measure	Timing of Measure
Energy Consumption	Provide high-efficiency LED lighting and appliances, and install a rooftop PV system sized to meet BASIX energy requirements.	Prior to OC
Cooling Load Requirements / Thermal Comfort Issues	Provide high-performance façade including upgraded glazing, insulation and shading.	Prior to OC
Water Consumption	Install rainwater tank connected to irrigation, and external taps; provide water-efficient WELS-rated fixtures throughout the development.	Prior to OC
Material Impacts / Lifecycle Performance	Use durable, low-maintenance, and environmentally responsible materials; prioritise materials with low embodied energy where feasible; ensure façade systems meet required thermal performance values.	During design development; confirmed prior to Construction Certificate.
Thermal Performance From Building Envelope	Provide high-performance glazing, adequate wall/roof insulation, external shading, and airtightness measures as modelled in NatHERS.	Prior to OC
Renewable Energy Contribution	Install solar PV panels positioned to maximise solar access and offset common-area or dwelling electricity loads.	Prior to OC

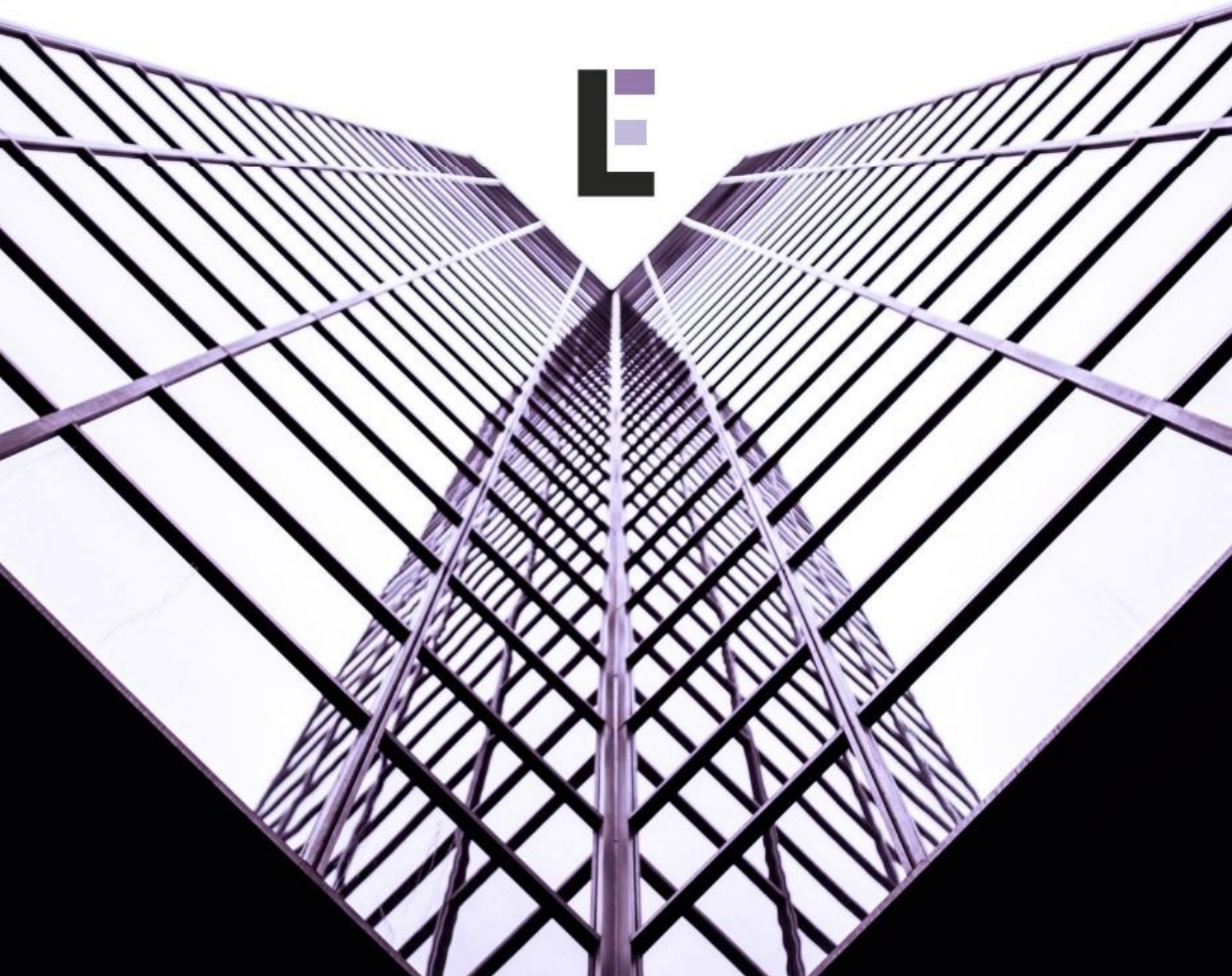
8 SUMMARY

This report summarises the sustainability targets and commitments for the new proposed a mix-use development located at 33 – 37 Herbert Street, St Leonards. The requirements for sustainability have been coordinated with the design team to allow the development to achieve a high level of sustainable practice across the entire development.

As part of its commitment to sustainability, the development has committed to the following:

- 5.5-star NABERS Energy rating for Office spaces
- 3-star NABERS Water rating for Office spaces
- Achieving the BASIX benchmarks in line with State Environmental Planning Policy - Sustainable Buildings (SEPP) 2022 requirements for mixed-use residential building:
    - BASIX Energy 60%
    - BASIX Water 40%
    - Avg NatHERS rating of 7-star
- Complying compliance requirements for NCC/BCA Section J 2022 (or NCC 2025 as appropriate), including a performance façade and shading devices
- On-site renewable energy generation through spatial provision for rooftop solar photovoltaics (PV)
- Following a range of sustainability initiatives across the site spanning energy efficiency, water efficiency, indoor environment quality, waste management and comfort
- Implementing mitigation strategies in response to climate change and the Urban Heat Island Effect.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability in line with industry best-practice, and SEARS requirements and are to be further developed during subsequent stages of the project.



Net Zero Statement

Mixed Use Development

33 – 37 Herbert Street, St Leonards

Project No.	P02799
Revision	03
Issued	21 April 2026
Client	Aqualand St Leonard Development Pty Ltd (Aqualand)

E-LAB Consulting
Where Engineering and Science Inspire Design.

SERVICE ENGINEER LOGO

RE: Net Zero Statement – 33 Herbert St, St. Leonards, Sydney

This Net Zero Statement has been prepared to address the relevant requirements under the NSW Sustainable Buildings State Environmental Planning Policies (SB SEPP) Section 3.3, and as defined under Section 35C of the Environmental Planning and Assessment Regulation 2021 (EP&A). It is intended to address the SEPP requirement of achieving net zero operational greenhouse gas emissions by 2035.

This Net Zero Statement only includes estimations for the non-residential spaces of the development.

In support of the above requirement, the building has been designed to minimise the emission of greenhouse gases and dependency on fossil fuel use. Further details of the estimated greenhouse gas emissions and building design are included in the following sections.

E-LAB CONSULTING	SERVICE ENGINEER
Engineering Lab NSW Pty Ltd  **Alex Kobler | Director** **Sustainability** 03.10.2025	*SERVICE ENGINEER SIGN-OFF*

Table of Contents

Revision	Date	Comments	Engineer	Reviewer
01	14.04.2026	Draft SSDA Issue	AN	AK
02	17.04.2026	SSDA Issue	AN	AK
03	21.04.2026	SSDA Issue	AN	AK

We recognise the Traditional Custodians of the land on which the proposed development will be constructed. We respect their enduring cultural and spiritual connections to the land and waters, and celebrate their knowledge, kinship, and values. We acknowledge that these connections to the land and waters have existed for millennia and will continue into the future. We respect the Elders who have gone before, together with those of today for their guidance on our shared journey. We recognise that we are, and always will be, on Aboriginal land.

1 Introduction

1.1 Purpose

This Net Zero Statement has been prepared to support a State Significant Development Application (SSDA) SSD-88511459 for the site at 33 – 37 Herbert Street, St Leonards.

This Net Zero Statement has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 21 August 2025 (SSD- 88511459).

The following plan aims to achieve the below objectives:

- Detail how the development has sufficient infrastructure in place to support an all-electric future
- Provide evidence of service equipment and spatial allocation that has enabled the electrification of the building
- Describe renewable energy generation infrastructure provided as part of the development;
- Describe energy reduction initiatives;
- Estimate energy consumption of the development; and
- Estimate GHG emissions for energy use of the development

1.2 DEVELOPMENT OVERVIEW

The SSDA seeks development consent for the following:

- Demolition of the existing buildings on site apart from the two-level, basement structure which is to be retained, adapted and reused for car parking;
- Site excavation, and other preparatory site works;
- Construction and operation of a part 13 storey and part 39 storey mixed use development comprising:
    - Approximately 413 dwellings including 46 affordable housing dwellings located on Levels 2 to 37 (excluding Level 4);
    - Shared amenities and landscaped communal open space on Level 4;
    - Approximately 5,918m2 of non-residential (commercial/ retail) GFA located on Ground and Level 1;
    - Car parking spaces within the basement and podium; and
    - Ground floor loading and servicing;
- Associated landscaping works; and
- Augmentation of utilities and infrastructure.
- Amend the Willoughby Local Environmental Plan (WLEP 2012) as follows:
- Rezone the subject site from E4 General Industrial to MU1 Mixed Use;
- Establish maximum height of RL 209.3m AHD;
- Amend maximum FSR from 1:1 to 7.15:1; and
- Establish non-residential FSR of 1:1.

1.3 SITE OVERVIEW

The site is located at 33-37 Herbert Street, St Leonards on Cammeraygal Country and is legally described as Lot 1 & 2 in DP 744175, Lot 3 in DP 772072, and Lot 1 in DP 115615. The site has an irregular shape with a total area of approximately 5,919m2, comprising two street frontages: a primary western frontage to Herbert Street of approximately 135m and a secondary northern frontage to Ella Street of approximately 65m.

The site is located in the Willoughby local government area (LGA), positioned 4.5km north of the Sydney CBD and 3km from the North Sydney CBD, with proximity to the centres of St Leonards and Chatswood. No. 33 Herbert Street is currently occupied by a three storey commercial building comprising retail and commercial office tenancies with basement parking, while No. 37 Herbert Street contains a single level retail showroom/warehouse building.

The site is in a highly accessible area, located approximately 400m walking distance from St Leonards train station and approximately 1km walking distance from the Crows Nest Metro station. The site benefits from its proximity to established commercial centres and excellent public transport connections, open space and critical health infrastructure.

The location of the site is illustrated in Figure 1.

- Aerial photo of site

Source: Urbis

1.4 Scope

This Net Zero Statement has been created to align with the Secretary's Environmental Assessment Requirements (SEARs) dated 21 August 2025 (SSD- 88511459. requirements, which focuses on Scope 1, 2 and 3 emissions. The statement must demonstrate that 100% of the development's energy can be sourced from renewables and all other operational GHG-e from the building can be offset in the future, to facilitate the complete transition to carbon neutral operations by 2035.

2 Energy Use

To achieve minimal on-site fossil fuel consumption during operation of the project, all building services will be electrically powered, including all major plant equipment which has been adopted to prioritize efficiency and enable the transition to a fossil-fuel free future without the need for further electrification works through the procurement of renewable energy and as the grid decarbonizes.

A gas is proposed for use in commercial kitchens within retail tenancies and hot water for commercial and retail areas. These connections will be designed with shut-off points to enable all electric operations by 2035. Gas has not been allowed for any other element of the development.

3 Energy Efficiency

The development will be employing several passive design features to lessen the electrical load from central systems and therefore reduce dependence and stress on the energy grid.

3.1 Passive Systems

The development will be utilising the following features to minimise heating and cooling loads:

- High-performance thermal envelope including insulation and glazed units which will contribute to the reduction of the undesirable heat gain and loss of the building.
- Proper sealing of the envelope through construction best-practices and verification will also be considered to ensure airtightness of the façade and undesirable bulk-air flow is minimized.
- Shading and efficient window-to-wall ratios to reduce solar gains
- Deep, large floorplates

3.2 Active Systems

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

- High-efficiency central plant designed to optimize energy use across all building services, including heating, ventilation, and air conditioning (HVAC), as well as domestic hot water systems.
- Smart building management and control enabling real-time optimization of energy use, reduced operational costs, and alignment with Net Zero and sustainability targets.
- Cooling system type: Centralised variable refrigerant units
- Heating system type: Centralised fan coil units with heated water
- High-efficiency Gas Hot Water Plant
- Gas commercial cooking equipment to both the main and prep kitchens.
- Solar photovoltaic (PV) panels installed on-site to generate renewable electricity.
- LED lighting throughout, including in common areas with efficiency controls to meet the requirements of NCC 2022 Section J. Controls may include motion sensors, time clocks and zoned switching
- Energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J8 requirements. The automated control of applicable centralised systems will reduce unnecessary energy consumption and allow energy demands to be better managed across the development.

3.3 Renewable Energy Generation and Storage

The roof area provides ample opportunity for the installation of solar photovoltaic system(s). These system will generate renewable electricity to offset consumption during times of peak on-site generation. Due to the relatively small building footprint compared to the overall floor area, the PV system is not expected to be able to generate a significant amount of electricity to offset total demand. Detailed sizing and specification of the system will occur during later stages of the project and will be installed at a rate that maximises coverage of the non-trafficable roof area. No energy storage has currently been allowed for.

4 Energy Consumption and Emissions Estimation

The estimated annual total energy consumption of the commercial office space of the development is summarised in the section below.

Table 1 Estimated Annual Energy Consumption

	Energy (kWh/year/NLA)
Estimated Fossil Fuel Consumption	11.60
Estimated Electricity Consumption	57.66
Total Estimated Energy Consumption	**69.262**

4.1 Energy Source

Energy consumption and associated emissions have been estimated using the NABERS Reverse calculator for retails (4.5-star NABERS Energy) and commercials (5.5-star NABERS Energy) based on current design detail. This can be considered as a realistic estimate of the predicted energy consumption to be used for the development given the current design stage.

Diesel has been predicted assuming minimal backup electricity power requirements for testing only (1% of total). Refrigerants have been estimated assuming a 2% loss factor each year*. The working refrigerant for heat rejection has been considered as R410A however this is subject to further design development and equipment selections.

4.2 Greenhouse Gas Emissions Estimation

The following section summarises the total GHG Emissions for the development based on the predicted energy consumption.

Table 2 Total Annual Estimated Greenhouse Gas Emissions breakdown

Scope	Emission source	GHG Emission (t CO2-e)	GHG Emissions %
1	Gas consumption	11.4	3.6%
	Diesel	0.99	0.3%
	Refrigerants	11.5	3.6%
2	Electricity Consumption	276.9	87%
3	Value chain*	16.2	5%
1,2 & 3	**TOTAL**	**317.0**	**100%**

**Scope 3 emissions are often complex to quantify and have large diversity, for the purpose of this NZ statement they have been estimated for purchased electricity only following the guidance provided in the 2024 National Greenhouse Accounts (NGA) Factors workbook provided by the DCCEW.*

4.2.1 Scope 1 Emissions

Scope 1 emissions refer to direct on-site emissions released to the atmosphere from sources controlled by the end user. The estimated Scope 1 emissions for the development are summarised in the tables below. Gas consumption has been calculated based on industry usage rates applicable to the relevant tenancy types, with 29% attributed to retail areas to reflect café and restaurant usage, and 10% attributed to office areas.

Table 3 - Annual Estimated Gas consumption and GHG Emissions

Emission source	Gas Consumption (GJ/hour)	GHG emission factor (kg CO2-e /GJ)	Emissions (t CO2-e)
Gas Consumption	**221.97**	**51.53**	**11.4**

The diesel consumption is restricted to the backup generators for emergency situations or power outages. Routine usage of the generator is confined to scheduled testing and maintenance. This estimation has been made conservatively, aligning with the principles of the NABERS energy rating tool for 1% of usage..

Table 4 - Annual Estimated Gas consumption and GHG Emissions

Emission source	DIESEL Consumption (KL)	GHG emission factor (kg CO2-e /GJ)	Emissions (t CO2-e)
Diesel Consumption	**0.36**	**70.2**	**0.98**

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

Table 5 - Annual Refrigerant GHG Emissions

Emission source	GWP (kg CO2-e /kg)*	Emissions (t CO2-e)**
``R-410A (HFC Blend)	**1,924**	**11.5**

**GWP for R-410A sourced from the Department of Climate Change, Energy, the Environment and Water, 2024*

***Assuming a 2.0% leakage factor*

4.2.2 Scope 2 Emissions

Scope 2 emissions are defined as those which are emitted beyond the boundary of the user and are therefore referred to as indirect emissions i.e. emissions released for energy generation through coal fired power plants supplied to the end user via the electrical gird. The development's estimated scope 2 emissions are summarised in the table below.

Table 6 - Annual Estimated Electricity consumption and GHG Emissions

Emission Source	Electricity Consumption (kWh.pa)	GHG Emission factor (kg CO2-e /GJ)*	Emissions (t CO2-e)
Electricity Consumption	**325,908.00**	**0.8496**	**276.9**

4.2.3 Scope 3 Emissions

Scope 3 emissions are all indirect emissions within the supply chain of operating the sites that are not fully under the developer's control. This includes *upstream* activities such as energy in goods and services consumed and employee travel and *downstream* activities such as waste, investments and actions that occur from the building. For the purpose of estimating scope 3 emissions, a factor of ***0.04kgCO_2e/kWh*** has been used based on National Greenhouse Accounting Factors 2024.

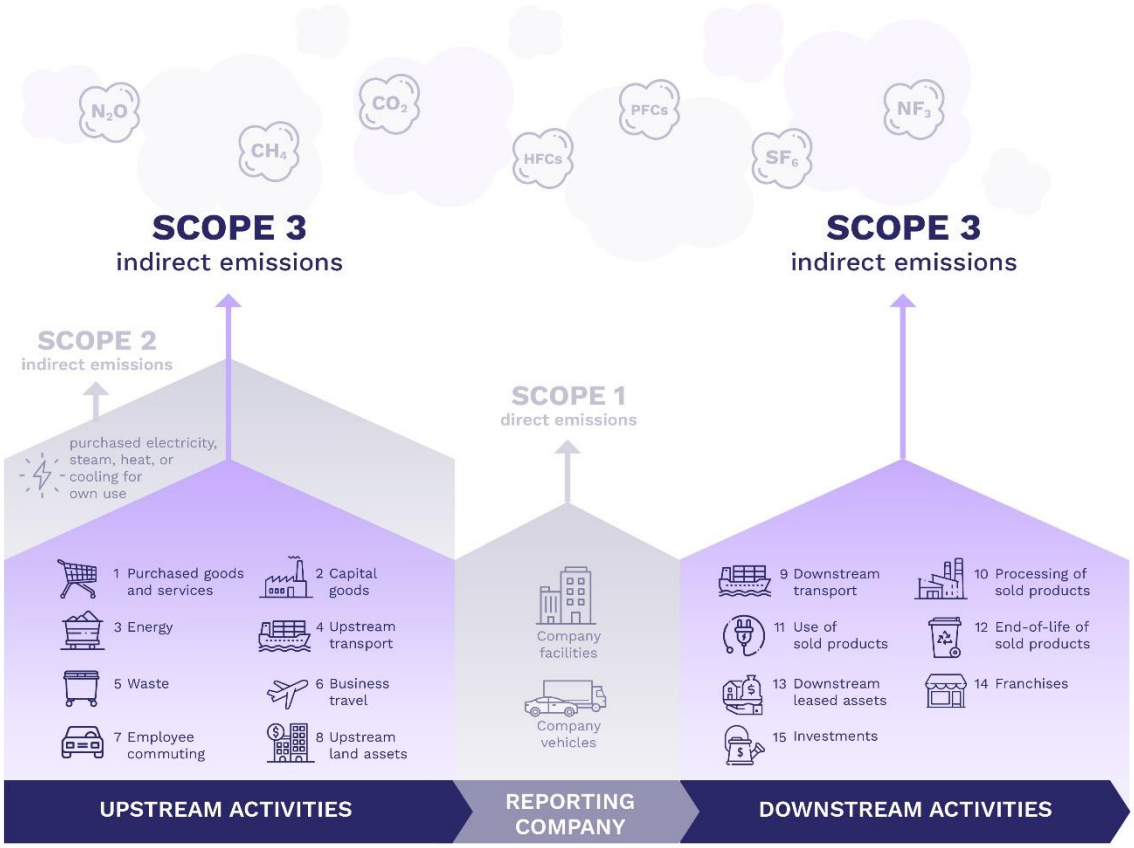


Figure 1. Scope 3 emissions (Source: thinkstep anz)

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

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

Upstream Scope 3	Downstream Scope 3
Category 1: Purchased goods and services	Category 9: Downstream transportation and distribution
Category 2: Capital goods	Category 10: Processing of sold products
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)	Category 11: Use of sold products
Category 4: Upstream transportation and distribution	Category 12: End-of-life treatment of sold products
Category 5: Waste generated in operations	Category 13: Downstream leased assets

Category 6: Business travel	Category 14: Franchises
Category 7: Employee commuting	Category 15: Investments
Category 8: Upstream land assets	

5 Transition Strategy

In order for the building to operate at net zero emissions by 2035, the project team have developed an appropriate transition strategy for the development to follow to enable net zero operations.

This strategy involves the following measures:

1. **Spatial allocation (electrical substation)**

   The electrical substation was originally sized for an all-electric building, including a capacity buffer. With gas now included in the design, the substation will operate under capacity. This means it will still be capable of supporting a future return to an all-electric building without requiring major upgrades. Spatial considerations have also been retained for ancillary equipment to allow future electrical services to be installed in place of the current gas infrastructure.

2. **Riser space and gas isolation**

   Space has been allowed for gas piping and metering/billing equipment, along with riser capacity to serve gas loads for cooking and DHW plant. Prior to 2035, gas supply can be isolated at the source and the metering equipment removed/returned to the relevant authority. Isolation/shut-off valves have been incorporated throughout the gas risers to support safe decommissioning and electrification works.

3. **DHW rooftop plant (future electrification)**

   The original all-electric design included allowances for a heat pump DHW system, including sufficient space and electrical infrastructure. Although the current design direction is for gas DHW, these provisions will be retained. This will allow a straightforward transition by 2035: the rooftop gas plant can be decommissioned and removed, the heat pump system installed in the pre-allocated space, and the system reconnected for all-electric operation.

6 Offset Of Residual Emissions

As per the Sustainable Buildings SEPP Overview guidance document section C.4; *The development must procure offsets for any onsite fossil fuel use, calculated for a minimum 10-year period. The offset type must be Australian Carbon Credit Units (ACCUs) or a Climate Active Carbon Neutral Certification.*

Proposed use	Net zero application requirements	Offset residual emissions
State significant development	Net Zero Statement to include the following: • Estimated scope 1 and 2 emissions up to 2050 • If fossil-fuel dependent systems are used, confirm adequate physical space, infrastructure, ventilation, and electrical capacity to operate without fossil-fuel by 2035 • Provide information about onsite renewables, passive design and other infrastructure (such as chilled beams) that improve energy performance	No
Large commercial development	As above, and • evidence of procurement of offsets where applicable	Yes, offset onsite fossil fuel use calculated over 10 year period

7 Limitations

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

Instead, this statement serves as a guideline for understanding the magnitude of associated emissions and the necessary interventions required for the building to operate towards a state of net zero operational carbon emissions.