



Flide Street, Caringbah

ESD Opportunities Report

Prepared for: Homes NSW

Project No: SYD3634
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Project: Flide Street, Caringbah
Location: 2 Flide Street
 Caringbah, NSW 2229
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Contents

1. Introduction	3
1.1 Project Overview.....	3
1.2 Project Description.....	4
1.3 Relevant Policies and Guidelines.....	6
2. Environmentally Sustainable Design (ESD) Opportunities.....	8
2.1 Façade design for affordability and decarbonization.....	8
2.2 Design for extreme heat and biodiversity.....	9
2.3 Designing for sustainable transport.....	12
2.4 Further Initiatives Incorporated.....	13

Tables

Table 1 Recommended WELS rating	17
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Figures

Figure 1 Proposed Development Site: 2 Flide Street.....	4
Figure 2 Section of proposed development.....	5
Figure 3 Elevations ordered from left to right: North, East, West, South.....	8
Figure 4 Cooling & biodiverse landscape design.....	9
Figure 5 Landscape provided in the NW corner of site with maximum solar exposure.....	10
Figure 6 Sydney Urban Heat Island Map (left) and 2020-2039 Climate change projection map (Right).....	11
Figure 7 Sutherland Shire Council LEP map – Project site shown with <i>Diamond</i>	11
Figure 8 Bike Access and Storage.....	12
Figure 9 Google Earth Image – Project Site Highlighted in red dashed line.....	13
Figure 10 Example of rooftop solar installation.....	15
Figure 11 Net-zero Pathway – the biggest impacts are in the bottom three rungs.....	16

1. Introduction

1.1 Project Overview

This ESD Opportunities Report has been prepared by ADP Consulting on behalf of Homes NSW (the applicant) for a concurrent State Significant Development Application (SSD-84862461) and Planning Proposal for the redevelopment of existing social housing (the Project) at 2 Flide Street, Caringbah (the Site).

The project involves the construction of two residential flat buildings—one rising to part 13 and part 14 storeys, and the other to 8 storeys—comprising a total of 164 social and affordable housing apartments. The development also includes a communal room and a two-level basement car park. To support the Proposal, adjustments to the permissible building height and floor space ratio (FSR) via an amendment to the Sutherland Shire Local Environment Plan 2015 are required.

The purpose of this ESD Opportunities report is to provide a list of Environmentally Sustainable Design (ESD) initiatives and recommendations to be considered for the proposed development and to address the Secretary's Environmental Assessment Requirements (SEARs) for the Project issued on 6 June 2025 which identified the following specific assessment requirements:

- > 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.
- > 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.

Following a review of the project brief, site location and architectural drawings, we propose the following key opportunities to be explored during the design, construction, and operation of the proposed development:

- > Façade design for affordability and decarbonisation
- > Design for extreme heat and biodiversity
- > Designing for sustainable transport

1.2 Project Description

1.2.1 The Site

The Site is located within the Sutherland Shire local government area (LGA) and is zoned R4 High Density Residential under the *Sutherland Shire Local Environmental Plan (SSLEP) 2015*.

The Site has a total area of approximately 3,596 square metres (sqm) and is bound by Flide Street to the north, Gardere Street to the west, Willawong Road to the east and the rail corridor for the T4 Eastern Suburbs & Illawarra Line to the south. Refer to Figure 1.

The site is accessible by public transport, being within 400m of the entrance to Caringbah Station and bust stops on the Kingsway which have frequent services to Sutherland, Miranda and Cronulla.

The Site currently comprises 38 social housing units within two 3 storey buildings with a single level basement car park.



Figure 1 Proposed Development Site: 2 Flide Street

1.2.2 Building Description

The project involves the construction of two residential flat buildings—one rising to part 13 and part 14 storeys, and the other to 8 storeys—comprising a total of 164 social and affordable housing apartments (Class 2).

There will be a community space, meeting room, communal bathroom, and bike parking for residents on ground level. The building also includes 2 lower ground stories with 85 car spaces for car parking.

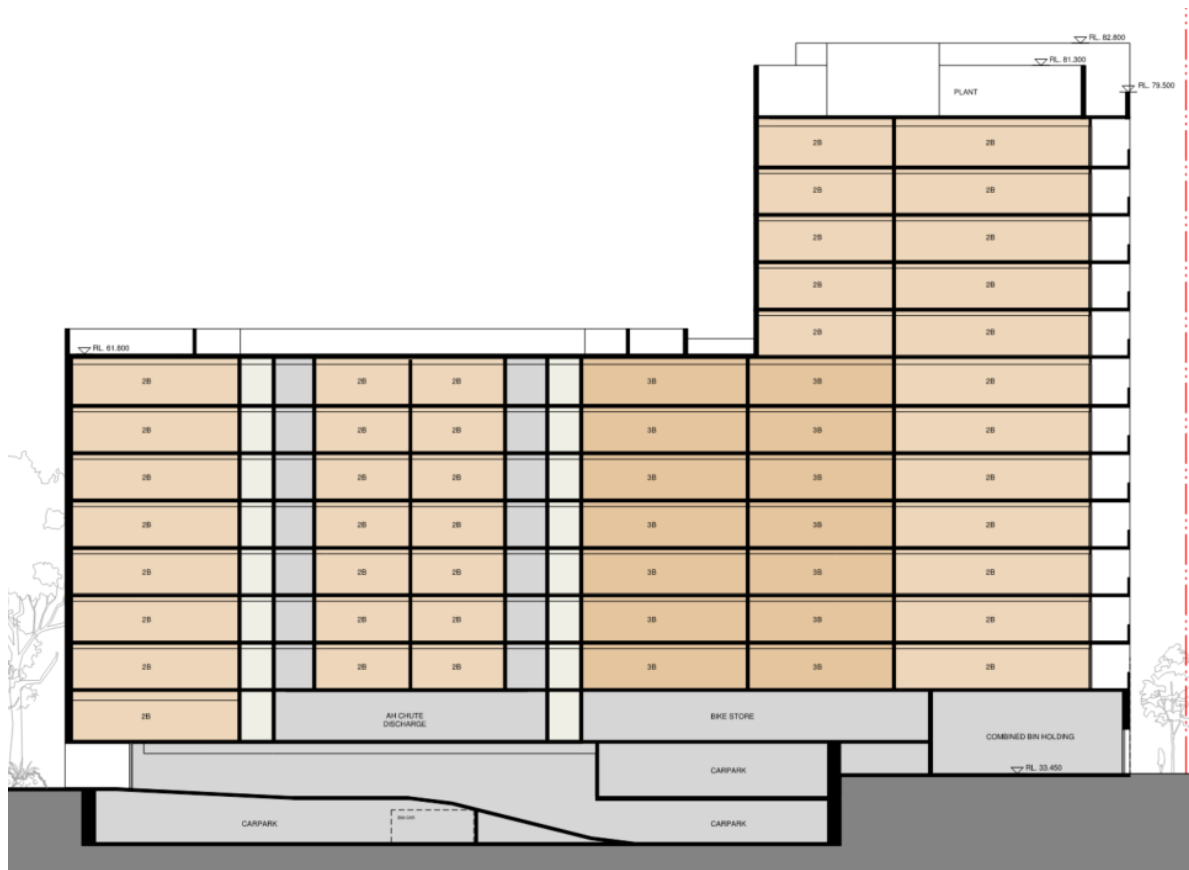


Figure 2 Section of proposed development

The building has an extensive façade, a comparatively narrow building footprint and roof, providing the building a high façade to roof ratio.

The proposed development will serve as social and affordable housing as operated by Homes NSW.

1.3 Relevant Policies and Guidelines

The following relevant policies and guidelines were used to guide the development of the ESD opportunities and recommendations for the proposed development:

- > State Environmental Planning Policy (Sustainable Buildings) 2022 (Sustainable Buildings SEPP 2022)- NSW Department of Planning
- > Planning Secretary's Environmental Assessment Requirements (SEARS)
- > Section J4 provisions of the NCC 2022 Building (BCA) Code of Australia
- > NSW Land and Housing Corporation (LAHC) Design Requirements
- > NSW Government Good Design for Social Housing (2020)
- > Sutherland Shire Council Development Control Plan (DCP) 2015
- > Sutherland Shire Council Local Environmental Plan (LEP)

1.3.1 State Environmental Planning Policy (Sustainable Buildings) 2022

The Sustainable Buildings SEPP 2022 is a state-wide environmental planning policy that sets minimum sustainability requirements for residential and certain non-residential development with the aim of reducing greenhouse gas emissions in line with the NSW Net Zero Plan.

The SEPP also mandates BASIX assessments for residential developments. BASIX assesses how the building will conserve water, energy, materials embodied carbon and bolster thermal comfort. Please note the BASIX assessment is a separate body of work to be submitted at DA.

1.3.2 SEARS Ecologically Sustainable Development (ESD) Principles

This ESD Opportunities Report addresses the Secretary's Environmental Assessment Requirements (SEARS) through the Sustainable Buildings SEPP (2022).

The SEARS requirement refers to section 193 of the EP&A Regulation (Environmental Planning and Assessment Regulation) and provide the guiding ecologically sustainable development (ESD) principles this type of report must answer to:

1. The precautionary principle (Aligned with Section 2.1.1 & 3.2)
2. Inter-generational equity (Aligned with Section 2.1.2 & 3.2-3.4)
3. Conservation of biological diversity and ecological integrity (Aligned with Section 2.1.2)
4. Improved valuation, pricing, and incentive mechanisms (Aligned with Section 2.1.1 and 2.1.3)

The report will also address the Secretary's Environmental Assessment Requirements (SEARS) – Development within identified sites and precincts (issued 18 June 2024) for the project, with the specific requirements of Requirement 9: Ecologically Sustainable Development (ESD):

- > 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.
- > Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.
- > Demonstrate how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources.

With regards to the SEARs requirements, Chapter 3 of Sustainable Buildings SEPP does not apply as the proposed development is entirely residential and does not include any non-residential development. As such, the requirements below are not applicable for this project:

- > NABERS embodied Emissions Materials Form
- > Net Zero Statement
- > NABERS Agreement(s) to Rate, or Commitment Agreement(s) to energy and water use

2. Environmentally Sustainable Design (ESD) Opportunities

The following opportunities have been identified as the key areas of focus with the most potential upside considering the specific building context of HAFFS Caringbah project:

- > Façade Design for affordability and decarbonization
- > Design for extreme heat and biodiversity
- > Designing for sustainable transport

This section of the report discusses how the project has designed in line with the above-mentioned opportunities and the future considerations that will be addressed in design development stage

2.1 Façade design for affordability and decarbonization

As affordable and social housing, HAFFS Caringbah has prioritised passive design measures to minimise reliance on artificial lighting and mechanical heating/cooling. This approach not only supports decarbonisation goals but also helps tenants benefit from lower utility bills.

The L-shaped footprint and high-rise form of the building result in a high façade-to-roof ratio. The roof accounts for only about 15% of the total envelope area, while the façade makes up approximately 85%. This proportion means the greatest savings can be achieved by prioritising façade optimisation.



Figure 3 Elevations ordered from left to right: North, East, West, South

Key strategies included in the design are:

- > **Optimised window-to-wall ratio (WWR)**
Walls generally perform better thermally than windows, as they reduce heat loss in winter and heat gain in summer. Therefore, the WWR has been reduced to around 50% as part of the design development, which is considered a good balance of passive cooling and heating strategies.
- > **Efficient glazing systems**
 - High-performance glazing has been identified for the project, that will reduce winter heat loss and summer heat gain.
 - Glazing with a low solar heat gain coefficient (SHGC) has been selected which limits unwanted heat from east- and west-facing windows, improving thermal comfort and reducing cooling demand.

- > **Façade and roof materials with low solar absorptance, low maintenance and durability have been selected**
Lighter-coloured materials with low solar absorptance (SA) reflect more solar radiation and absorb less heat, leading to cooler surface temperatures and reduced overall building heat gain.
- > **Provision of high levels of insulation**
Insulation to external walls, roof and exposed floors will improve thermal performance of the building envelope, lowering heating and cooling energy demand.

2.2 Design for extreme heat and biodiversity

In response to a warming climate and the risk of biodiversity loss, the project has implemented measures to create a cooler environment and enhance local biodiversity. Relevant design initiatives are identified below:

- > **Retention of existing trees**
Healthy, established trees have been retained on site to provide canopy cover and natural shade.
- > **Native and adaptive planting**
Landscaping predominantly includes native, low water, and adaptive flora species suited to the local bioregion. These species offer resilience to local conditions while requiring less maintenance.
- > **Layered vegetation structure**
The landscape design integrates a mix of groundcover, shrubs, and trees to form a stratified habitat that supports a diversity of animal species across different "layers."
- > **Habitat features**
Natural elements such as fallen logs, rocks, and leaf litter are retained or introduced within planting zones to provide habitat and forage resources for local fauna.
- > **Biodiverse planting mix**
A diverse selection of flora species has been included to strengthen ecological resilience, provide seasonal variety, and support pollinators and other fauna throughout the year.

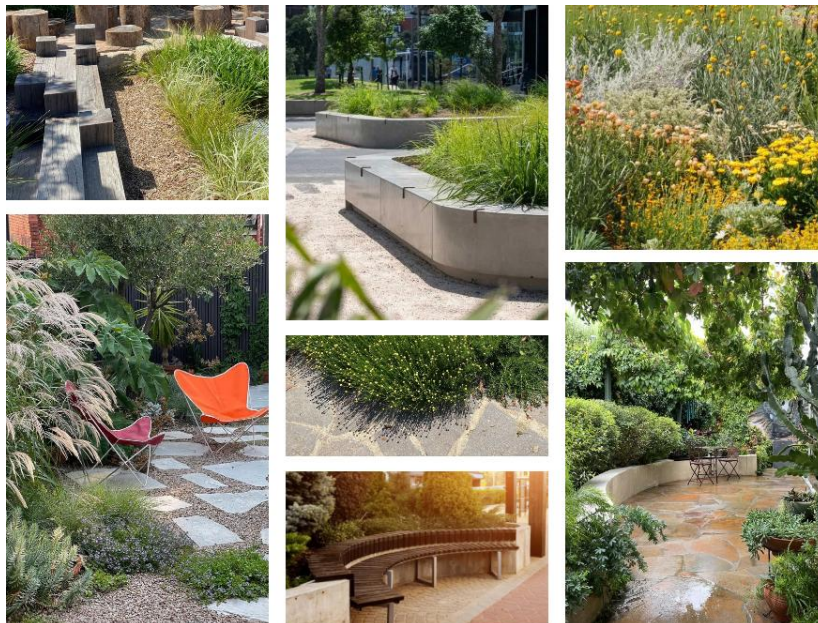


Figure 4 Cooling & biodiverse landscape design

The North-Western corner of 2 Flide street is unshaded by buildings and receives the most solar radiation, therefore it is the most efficient space for landscape integration (figure 5).



Figure 5 Landscape provided in the NW corner of site with maximum solar exposure

2.2.1.1 Urban heat island effect and resilience

2.2.1.1.1 Addressing urban heat island effect and resilience

The site is currently 3–6°C warmer than surrounding rural areas due to the urban heat island effect (refer Figure 7). Local annual temperatures are also projected to rise by approximately 0.8°C between 2020–2039 (Figure 7), with Sydney expected to experience significantly more frequent and intense heatwaves in the future. These projections highlight the importance of designing for resilience to extreme heat.

The project responds to these risks by retaining established trees for shade, incorporating native and adaptive planting, and introducing layered vegetation to provide natural cooling and reduce heat build-up at ground level. These measures reduce reliance on mechanical cooling while improving outdoor thermal comfort for residents.

2.2.1.1.2 Enhancing biodiversity and ecological connections

The site sits in close proximity to several parks and conservation areas (Figure 9), including the Royal National Park to the south across Yowie Bay. With NSW projected to lose up to half of its threatened species by 2050, the development is actively contributing to biodiversity resilience by embedding habitat-supporting landscape features.

Strategies include native and adaptive species planting, mixed vegetation layers, and natural habitat features such as logs, rocks and leaf litter to support pollinators, birds, and small fauna. These design choices aim to

strengthen fragmented ecological networks around the site and provide stepping-stone habitats that may support future wildlife populations.



Figure 6 Sydney Urban Heat Island Map (left) and 2020-2039 Climate change projection map (Right)

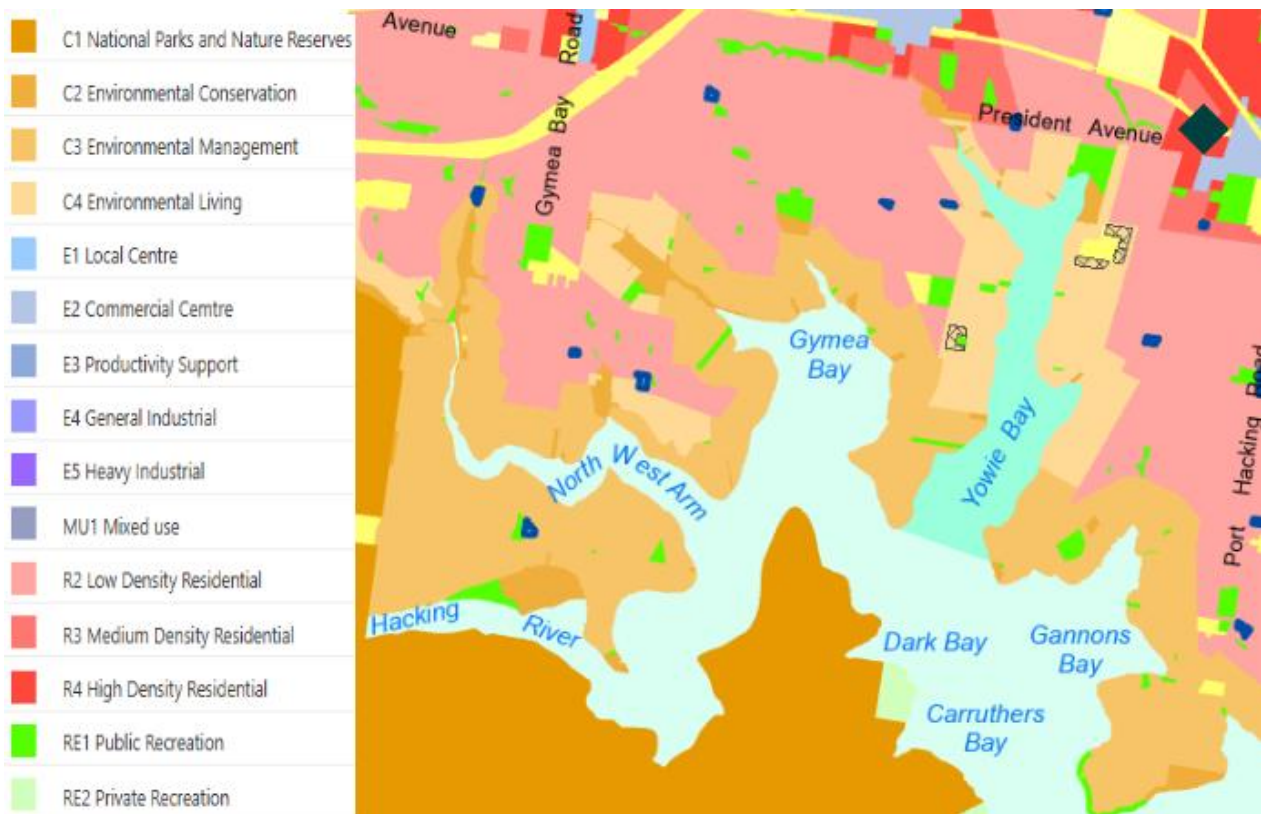


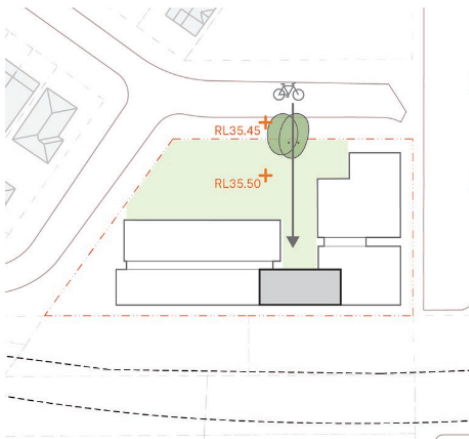
Figure 7 Sutherland Shire Council LEP map – Project site shown with Diamond

2.3 Designing for sustainable transport

In line with the project’s objective to provide affordable housing, the development is designed to encourage transport options that are cost-effective, sustainable, and accessible for tenants. The project has achieved this through:

- > **Bicycle infrastructure**
Secure bike storage spaces are provided for residents, alongside the integration of bike paths within project walkways to support safe and convenient cycling (See Figure 9)
- > **Social and universal design initiatives**
The project adopts universal design principles to ensure equitable access to transport facilities, supporting all residents regardless of mobility needs.
- > **Future Exploration: Micromobility support**
The project will explore the inclusion of dedicated spaces for electric bicycle charging, which can also accommodate mobility scooters, enhancing accessibility for a diverse range of tenants.

The project’s location further strengthens its sustainable transport offering: being only a 350-metre walk from Caringbah train station and Kingsway bus station (Figure 11), tenants are well-positioned to rely on affordable public transport while remaining connected to the wider city.



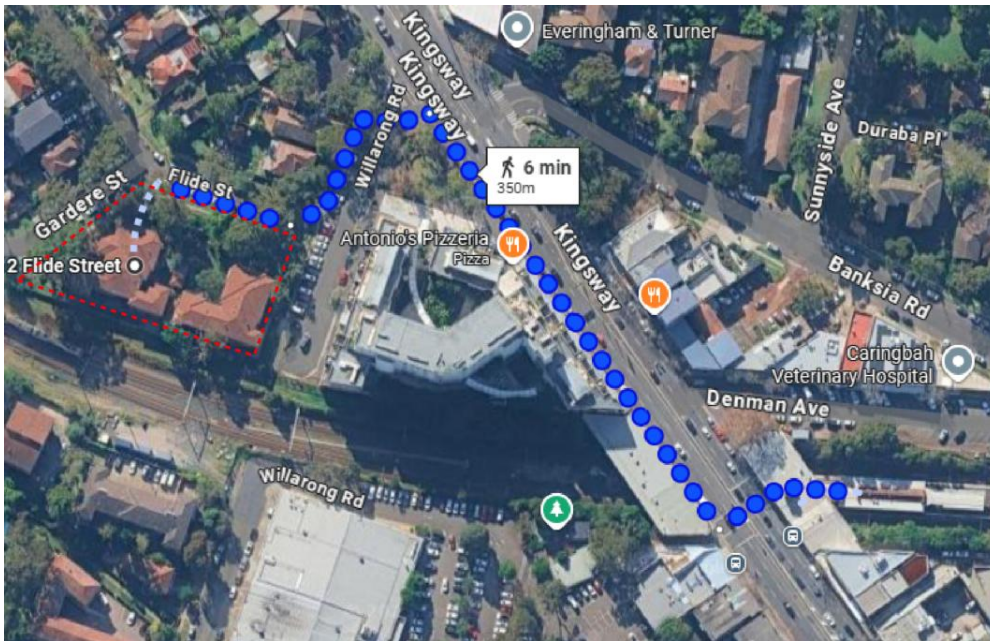
4.1.2 Bike access via level communal courtyard

At the centre of the Flide Street frontage, another access point is provided directly into the communal open space. Located under the canopy of two retained Jacaranda trees, the gated entry provides convenient access for residents to the courtyard into the communal bike store. The communal courtyard has been raised, removing the existing sunken condition to the site, and instead providing level access along Flide Street.



Figure 8 Bike Access and Storage

Figure 9 Google Earth Image – Project Site Highlighted in red dashed line



2.4 Further Initiatives Incorporated

2.4.1 General

This section outlines additional Environmentally Sustainable Design (ESD) design measures that can supplement the above (section 2) and can also help the project to align with sustainability ambitions of Homes NSW and Sutherland Shire Council.

Following a review of these requirements, site location and architectural drawings, we propose the following areas of sustainability to be explored during the design, construction, and operation of the proposed development:

- > Energy & Greenhouse Gas Emissions
- > Water Efficiency & Conservation
- > Low Carbon Materials
- > Waste Management Practice
- > Healthy Indoor Environment Quality
- > Recommended Social Initiatives
- > Landscape design for Biodiversity
- > Sustainable Management Practices

2.4.2 Energy & Greenhouse Gas Emissions Reduction

The project team is implementing a range of measures to minimise the building's greenhouse gas emissions and improve energy efficiency in operation in addition to the façade improvements discussed above. The following section outlines the key design strategies being adopted.

2.4.2.1 Heating, Ventilation, & Air Conditioning (HVAC) Design

The HVAC design directly influences ongoing energy use and indoor air quality. The project incorporates the following measures to improve system efficiency:

- > **Natural ventilation and ceiling fans:** Apartments and other occupied spaces are provided with operable windows to reduce reliance on mechanical ventilation and air conditioning. Ceiling fans may be explored in the future design stages to further offset or supplement AC use and improve ventilation.
- > **Efficient air-conditioning systems:**
 - Individual heating and cooling systems (split systems) with an EER/COP of 3.5-4.0.

2.4.2.2 Lighting Design

Lighting is a significant ongoing energy user in buildings. The design integrates energy-efficient solutions to lower operational costs and improve performance:

- > **Optimised orientation and natural lighting:** The building form and orientation are optimised for passive solar performance—cooling in summer and passive heating in winter—while reducing artificial lighting needs through well-sized glazed windows and clerestory windows where appropriate.
- > **High-efficiency LED lighting:** Dedicated LED lights are specified to deliver appropriate lighting levels and colour rendering while minimising energy consumption.
- > **Maintenance considerations:** Lighting design also factors in access and ease of maintenance to reduce long-term costs and will be further detailed in the next phase of design
- > **Smart lighting controls:** Controls are customised to occupancy patterns, ensuring lights operate only when required as a combination of motion sensors, zone switching, and timers

2.4.2.3 Domestic Hot Water

Domestic hot water design impacts both energy and water consumption. The project includes:

- > **Efficient central system:** A central electric heat pump (air-sourced) with high efficiency (COP between 3.0 and 3.5).
- > **Pipe insulation:** Hot water distribution pipes are insulated with minimum R0.6 material to minimise heat loss and reduce energy demand.
- > **High efficiency showers:** The project utilises high WELS rating showers (4 stars) to reduce hot water usage, which in turn reduced the energy consumption of the hot water system

2.4.2.4 Facilities

The project is designed to operate as an **all-electric building**, further reducing greenhouse gas emissions. Initiatives include:

- > **Balcony clotheslines:** Each apartment includes a screened clothesline, enabling residents to dry clothes naturally and avoid using energy-intensive dryers.
- > **Efficient appliances:** Induction cooktops and electric ovens are provided in all apartments.

- > **Central electric hot water system:** Ensures consistency, efficiency, and avoids reliance on fossil fuels.

2.4.2.5 Onsite Renewables

The project follows a staged approach to energy: first minimising demand through passive design, then optimising efficiency with appliances and fittings, and finally generating renewable energy on-site. These measures align with the net zero ambitions of NSW Land and Housing Corporation (LAHC) and mandatory Homes NSW requirements.

- > **Rooftop solar PV system:** A photovoltaic (PV) system will be installed on the roof, with a current provision for an 8 kW peak array.
- > **Optimised design:** Layout and orientation of the PV system are being carefully considered to maximise performance within the constraints of roof space, aesthetics, orientation, and maintenance requirements.



Figure 10 Example of rooftop solar installation

2.4.2.6 Metering & Monitoring

Metering and monitoring are critical to ensure operational efficiency and to provide feedback on the effectiveness of sustainability initiatives. The project integrates a comprehensive metering strategy to track and manage resource use, enabling building owners to identify opportunities for improvement and address issues such as leakage or wastage.

The strategy includes:

- > **Energy and water monitoring at the distribution level,** allowing identification of main consumption factors and any building components associated with inefficiency.
- > **Monitoring of major systems,** including:
 - Incoming electrical and water mains supply
 - Electrical supply and thermal meters for distinct areas and uses
 - Energy and water metering for individual dwelling units
 - Common area lighting systems

2.4.3 Net Zero Operational Carbon Emissions

In line with the NSW Net Zero Plan by 2050, the project has the opportunity to reduce its greenhouse gas emissions generated by its operational energy use. The following strategy has been proposed as a pathway for the development to achieve net zero:

- > **Measure:** At a minimum, annual review of the building monitoring system and services efficiencies.
- > **Reduce:** ESD initiatives explored in Section 2-3 – reduce operational energy and water consumption, encourage behaviour changes to reduce operational waste
- > **Generate:** Generating energy on-site will decarbonise the project and supply carbon-neutral electricity in the long-term
- > **Offset:** Future Consideration
- > **Certify:** Future Consideration

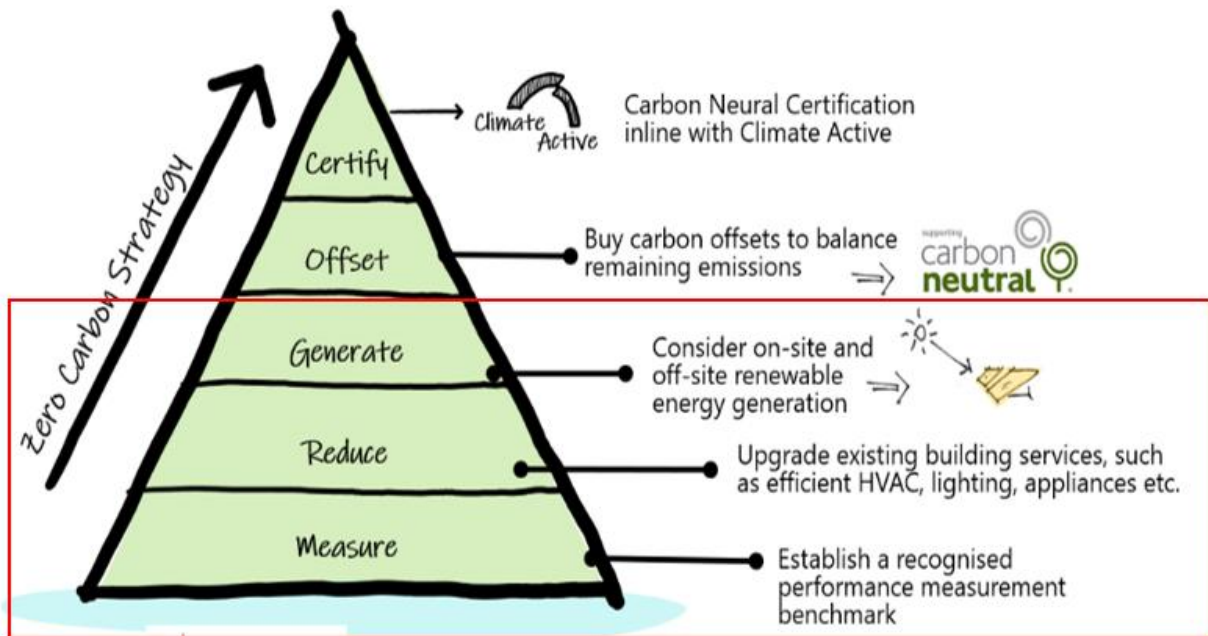


Figure 11 Net-zero Pathway – the biggest impacts are in the bottom three rungs

2.4.4 Water Efficiency & Conservation

HNSW Caringbah is implementing a range of initiatives to reduce potable water consumption and optimise reuse, lowering operational costs for tenants while meeting LAHC design requirements.

Key strategies include:

- > **High-efficiency fittings and fixtures**

All apartments will be fitted with highly efficient WELS-rated fixtures and appliances. These reduce potable water use while maintaining performance standards.

Table 1 Recommended WELS rating

Water fixture/fitting/appliance	Minimum WELS rating
Taps	5 Star
Toilets	4 Star
Showers	4 Star (> 4.5 but ≤ 6.0 L/ min)

- > **Native landscaping**

Landscape design prioritises native and adaptive plant species suited to the local bioregion, reducing the need for irrigation and supporting biodiversity.

- > **Rainwater harvesting**

A 10kL rainwater tank will be installed to capture roof runoff, supplying irrigation for the landscaped areas and further reducing reliance on potable water.

By optimising water efficiency through these measures, the project supports affordable living for tenants with lower utility bills, while aligning with NSW Land and Housing Corporation (LAHC) requirements mandated across all Homes NSW developments.

2.4.5 Waste Management Practice

The project is implementing waste management strategies that prioritise avoidance, reduction, and diversion from landfill, following the waste hierarchy illustrated in Figure 16.

To support these objectives, the project is guided by two best-practice waste management plans:

- > **Construction & Demolition (C&D) Waste Management Plan**

This plan reduces the total amount of waste sent to landfill compared with typical buildings of this type, through strategies such as material reuse, recycling, and careful site management.

- > **Operational Waste Management Plan**

The plan addresses waste generated during occupancy and building operation, including:

- Identifying relevant waste streams for different operational areas and assigning responsibility for implementation.
- Encouraging separation of waste streams via dedicated bins, storage areas, and recycling facilities in public and communal areas.
- Designating storage areas for all waste streams, with best-practice guidance on safety, access, and collection.
- Establishing safe methods for vehicle access and transfer of waste to external collection or processing facilities.

By embedding these strategies into both construction and operational phases, the project ensures effective waste reduction and diversion, supporting sustainability goals and regulatory compliance.

2.4.6 Social Initiatives

As part of the project's ongoing sustainability vision, social sustainability measures are being embedded to enhance community wellbeing, inclusivity, and cultural recognition. Key initiatives include:

- > **Engagement with Traditional Custodians**
The project involves consultation with Traditional Custodians to integrate the principles of Designing with Country and identify potential sites for cultural interpretation within the development. This has been incorporated via landscaping design.
- > **Responsible and inclusive procurement**
Contractors are selected based on ethical practices, including responsible supply chains and compliance with modern slavery legislation, ensuring socially responsible construction processes.
- > **Communal spaces for residents**
The development provides an indoor communal room, a shared residential roof terrace, and landscaped outdoor communal areas. These spaces support community interaction and allow services and programs to be offered to tenants.

These initiatives align with the Sutherland Shire Council DCP (2015) and LAHC design requirements, contributing to a safe, inclusive, and culturally responsive environment for residents.