ARUP

Health Infrastructure NSW

Rouse Hill Hospital

State Significant Development Application (SSD-96248991) - Net Zero Statement

Reference

Rev 6 | 27 October 2025

Image by HDR

Job number 288004-00

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Document Verification

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Revision	Date				
Revision 1	18/10/2024	**Filename**	RHH SSDA Net Zero Statement		
		Description	Draft Issue		
			Prepared by	**Checked by**	**Approved by**
		Name	Sam Garton	Alexander Hespe	Alexander Hespe
		Signature			
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			Prepared by	**Checked by**	**Approved by**
		Name	Sam Garton	Alexander Hespe	Alexander Hespe
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			Prepared by	**Checked by**	**Approved by**
		Name	Sam Garton	Alexander Hespe	Alexander Hespe
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		Name	Sam Garton	Alexander Hespe	Alexander Hespe
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		Name	Sam Garton	Alexander Hespe	Alexander Hespe
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			Prepared by	Checked by	Approved by
		Name	Sam Garton	Alexander Hespe	Alexander Hespe
		Signature			
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		Name			
		Signature			

Issue Document Verification with Document ✓

Contents

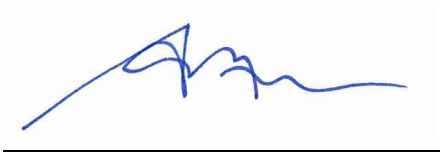
Cover Note and Certification

This Net Zero Statement has been prepared by Arup to support a State Significant Development Application (SSDA) for the Rouse Hill Hospital (RHH) at the corner of Commercial Road and Windsor Road, Rouse Hill (SSD-96248991).

The building is designed to be capable of being fossil fuel-free immediately upon occupation, as detailed in this document.

Certification

I am a qualified engineer familiar with the project. I hereby certify that all evidence and information within this statement is correct to the best of my knowledge.

Name Position Company	**Alexander Hespe** Associate Arup
Qualification/s	BE (Mechanical)
Signature	

1. Introduction

This Net Zero Statement has been prepared by Arup to support a State Significant Development Application (SSDA) for the construction and operation of a new hospital campus at the Corner of Commercial Road and Windsor Road, Rouse Hill (SSD-96248991).

The proposed development comprises:

- Site preparation including earthworks and tree removal;
- Construction of internal roads with connection to Commercial Road;
- Incoming electrical and communications services
- Construction of hospital buildings up to eleven storeys;
- Construction of a ten storey above-ground car park;
- Pedestrian and cycle pathway connections;
- Landscaping; and
- Ancillary works to Commercial Road, comprising:
  - minor works (including realignment of existing median strip, kerb and gutter, footpath and lane marking) to provide access from Commercial Road into Hospital Road; and
  - associated tree removal along Commercial Road.

The scope of the proposed works includes:

- An emergency department and primary access clinic
- Comprehensive birthing services including birthing rooms and a maternity inpatient unit
- Inpatient beds and day surgery services
- Short stay medical assessment services
- Pathology, pharmacy, and medical imaging services
- Outpatient and ambulatory care services including paediatrics and renal dialysis and antenatal and postnatal services
- Virtual care and hospital in the home services
- Prehabilitation, rehabilitation and lifestyle medicine.
- Administration, staff support, loading dock and back-of-house services; and
- Ancillary commercial uses to support the hospital, including retail.

In reference to the site boundary:

- Hospital site boundary (Lots 311 and 312)

SSDA site will extend to the full extent of works including the hospital site, footpath connection (Part Lot 229), construction compounds (Part Lot 229) and works to Commercial Rd (Lot 2011, DP 1131519 and Lot 101, DP1060353)

1.1 SEARs Requirements

This report has been prepared to satisfy Section 3.4 of the Sustainable Buildings SEPP and in response to Item 9: "Provide a net zero statement (as defined in section 35C of the EP&A Regulation) of the Secretary's Environmental Assessment Requirements (SEARs) issued for the SSDA on 16th October 2025 for SSD-96248991, that includes:

- Evidence of how the development will either be fossil fuel-free after the occupation of the development commences or transition to be fossil-fuel free by 1 January 2035.
- Details of any renewable energy generation and storage infrastructure implemented and any passive and technical design features that minimise energy consumption.
- Estimates of annual energy consumption for the building and amount of emissions relating to energy use in the building (if information is available).

2. On-site fossil fuel usage

Rouse Hill Hosptial (RHH) is designed to be capable of operating fossil fuel-free immediately upon occupation.

All building services in normal operation will use electricity, including space heating and domestic hot water. No grid gas connection will be provided to the site for energy.

The emergency backup power generators will be capable of running on Hydrotreated Vegetable Oil (HVO), a fossil fuel-free alternative to diesel. It is noted that regular maintenance and testing of diesel generators typically contribute to a small percentage (in the order of 1%) of a building's operational energy greenhouse gas (GHG) emissions.

Table 1 Fuel Usage

Item	Day One Energy Source	Transition to Net Zero
Building services including HVAC – electric equipment	Grid electricity – NSW Government managed	Grid electricity – NSW Government managed transition to 100% net zero by 2050
Heating hot water generation – heat pump		
Domestic hot water generation – heat pump		
Emergency backup power generators – internal combustion engine	Diesel fuel	Capable of using Hydrogenated vegetable oil (HVO)

Alternatives for emergency backup power have been considered including batteries, hydrogen and solar. However, diesel/HVO generators are the only viable option at this point in time which are a proven technology and achieve the extent of backup required under AS3009 and the Health Infrastructure NSW Engineering Services Guide (ESG).

Evidence of the fossil fuel-free operations are within the following services documentation:

- Electrical & Communications Services SSDA report by JHA
- Hydraulics and Fire Systems Engineering SSDA report by ACOR

3. Renewable Energy Generation and Storage

RHH is being designed to generate renewable energy on site with the following approximate solar photovoltaic (PV) capacity based on current spatial allowance:

- Hospital rooftop – 180 kWp
- Carpark roof – 237 kWp

A battery energy storage system is not included in the current design as all solar PV energy generated is expected to be used on-site, and any excess exported to the grid.

4. Energy-efficient design

As a NSW Health Infrastructure development, the project has minimum energy efficiency targets as noted in Design Guidance Note 058 (DGN058).

- NCC Section J Energy – minimum required 10% improvement compared to code compliant baseline
- DGN058 energy model – aligned with ESD Evaluation Tool Credit 15E.2 GHG Reduction

Strategies to reduce operational energy use considered in the design include:

- Passive design with insulated, air-tight, shaded and high-performance façade with appropriate window to wall ratio.
- High efficiency chillers and heat pumps
- Chilled water temperature reset
- Controls tuning such as staging of cooling towers and fan speeds controlled by the chiller optimisation controller with sufficient metering and monitoring strategy
- Widened air temperature set points for rooms in non-critical areas
- Low lighting power density, and lighting controls with occupancy and daylight sensors

5. Energy Consumption

Energy modelling will be undertaken as the project progresses to test energy reduction initiatives and confirm compliance with the above energy reduction requirements and targets. The project Mechanical Engineering consultant, JHA, provided the following estimates for operational energy use based on energy modelling (results based on 40,960m^2 conditioned area).

	Proposed model		Reduction compared to reference model (NCC2022 code compliance)
	Electricity (kWh/year)	GHG Emissions (kgCO2/year)	GHG Emissions %
Internal Lighting	1,872,380	1,310,666	-
Equipment and Appliances	4,342,360	3,039,652	-
Space Heating – Heating Hot Water Plant	772,840	540,988	28%
Domestic Hot Water	650,000	455,000	-
Space Cooling – Chilled Water Plant	849,420	594,594	19%
Air Conditioning Fans	1,112,090	778,463	12%
Mechanical Ventilation Fans	849,240	594,468	-
Pumps	297,510	208,257	-
Vertical Transport	400,390	280,273	-
Total energy use excl. solar	**11,146,230**	**7,802,361**	**6%**
Solar PV	-530,000	-371,000	-
Total incl. solar	**10,616,230**	**7,431,361**	**10%**
Total per m^2	**259**	**181**	

GHG emission factor from Australia's National Greenhouse Accounts Factors 2024, NSW Scope 2 and 3 (0.70 kgCO2e/kWh)

6. Conclusion

In conclusion, RHH is being designed to be capable of being fossil fuel-free immediately upon occupation. It complies with the Sustainable Buildings SEPP Section 3.4 (2), as it minimises the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.