

NSW Department of Education

Bungendore High School

Net Zero Statement

Reference: ESD-BHS-REP-005

8 | 17 March 2025

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 304002-00

Arup Australia Pty Ltd | ABN 76 625 912 665

Arup Australia Pty Ltd

Level 5

151 Clarence Street

Sydney

NSW, 2000

Australia

[arup.com](https://www.arup.com)

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		Name	Enda Seyama-Heneghan	Alex Rosenthal	Edward Caine
		Signature			
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		Name	Enda Seyama-Heneghan	Alex Rosenthal	Edward Caine
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		Name	Enda Seyama-Heneghan	Alex Rosenthal	Edward Caine
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		Name	Enda Seyama- Heneghan	Alex Rosenthal
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		Signature	Edward Caine	
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		Name	Enda Seyama- Heneghan	Alex Rosenthal
		Signature	Edward Caine	

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		Name	Enda Seyama- Heneghan	Alex Rosenthal
		Signature		Edward Caine

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Cover Note and Certification

This Net Zero statement has been prepared to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for the construction and operation of the new Bungendore High School (the activity).


The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as “development permitted without consent” on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI). The purpose of this report is to demonstrate how the development minimises the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.

The building is being designed to minimise the use of fossil fuels upon occupation, and to allow for future transition to fossil-fuel free operations.

Certification

I am a qualified electrical 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	Ed Caine
Qualification	C Eng
Signature	

1. Introduction

This Net Zero Statement has been prepared to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for the construction and operation of the new Bungendore High School (the activity).

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as “development permitted without consent” on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI) as well as the Addendum Division 5.1 guidelines for schools and Addendum October 2024 (Consideration of environmental factors for health services facilities and schools).

The purpose of this report is to satisfy Section 3.3 (1) of the State Environmental Planning Policy (Sustainable Buildings) 2022 (Sustainable Buildings SEPP), which considers whether the activity minimises the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.

1.1 Site Description

The current street address is part of 18 Harp Avenue, Bungendore, NSW, 2621 (the site), and is legally described as part Lot 125 in Deposited Plan 1297613. As shown at Figure 1, the proposed school site forms part of a larger lot which is the subject of a proposed residential subdivision.

The site is located within the North Bungendore Precinct (Elm Grove Estate) in Bungendore. As a result of precinct wide rezonings, the surrounding locality is currently transitioning from a semi-rural residential area to an urbanised area with new low density residential development.

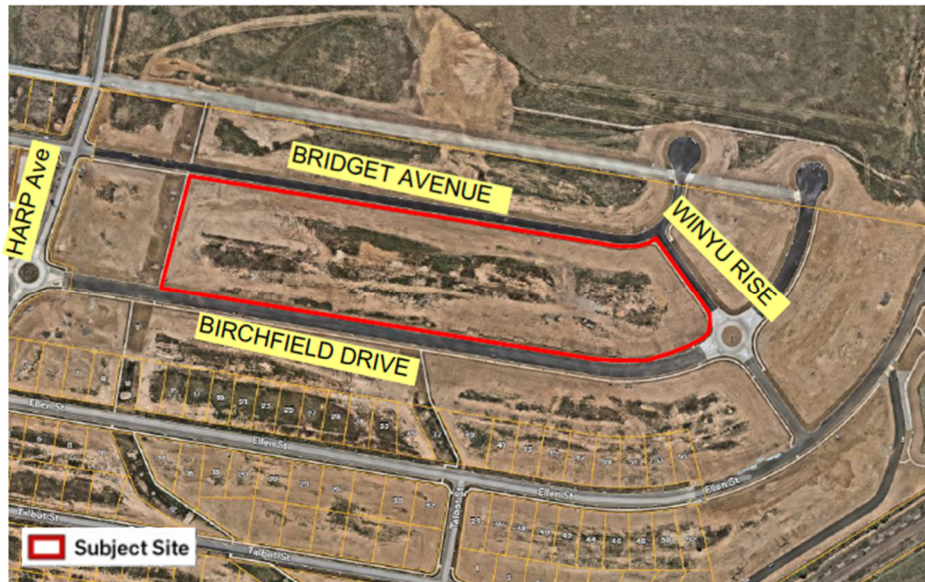
The site is zoned R2 Low Density Residential, with all adjoining land also zoned R2 Low Density Residential.

The site has three frontages:

- Approx 500m southern frontage to Birchfield Drive.
- Approx 500m northern frontage to Bridget Avenue.
- Approx 100m eastern frontage to Winyu Rise.

The site is currently cleared of all vegetation and consists of grassland, having been prepared for the purposes of future low density residential development.

Figure 1 Aerial Photograph of the Site



Source: Urbis, 2024

1.2 Proposed Activity Description

The proposed activity is for the construction and operation of a new high school in Bungendore at part 18 Harp Avenue, Bungendore (the **site**). The new high school will accommodate 600 students and 68 staff. The school will provide 26 general learning spaces, and three support learning spaces across two buildings. The buildings will be predominantly three-storeys in height and will include permanent and support teaching spaces, specialist learning hubs, a library, administrative areas and a staff hub.

Additional core facilities are also proposed including a standalone school hall with covered outdoor learning area (COLA), a car park, a kiss and drop zone along Birchfield Drive, sports courts and a sports field. The new school also features a single storey building with associated paddocks in the far western portion of the site designed for livestock management and hands-on agricultural learning.

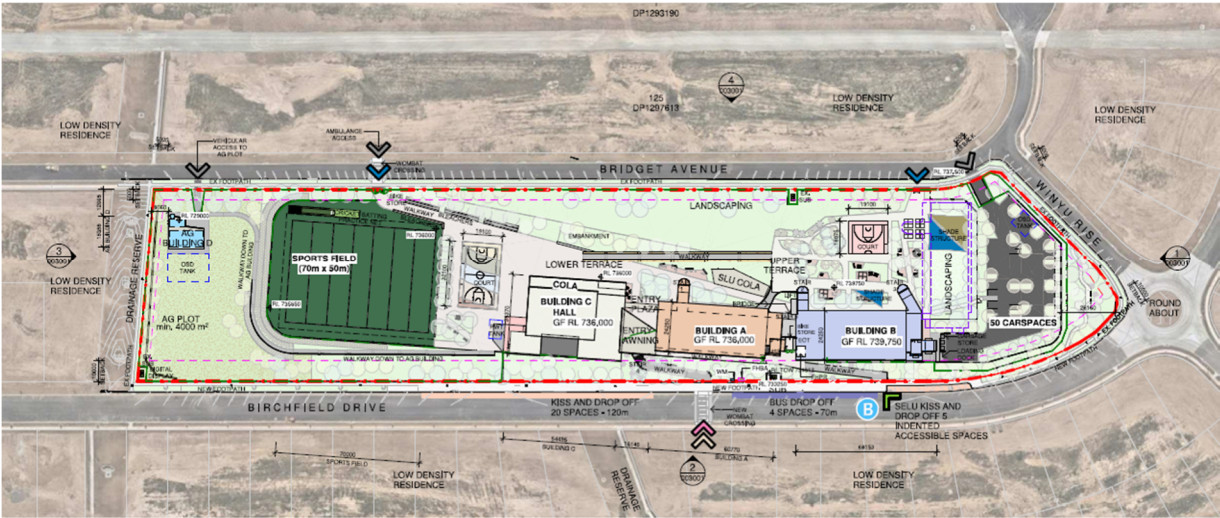
Specifically, the proposal involves the following:

- Building A, a three-storey learning hub accommodating general learning spaces, a special education learning unit (SELU), a physical education centre, a performing arts space, and other core facilities including administrative areas, staff hub, library and end of trip facilities.
- Building B, a part three/part four storey learning hub accommodating general learning spaces, specialist workshops for food, textile, wood and metal workshops, as well as visual arts studios, science labs and staff areas.
- Building C, a standalone school hall with COLA.
- Building D, a single-storey agricultural block comprising an animal storage space, a COLA and internal workshop.
- On-site staff car park with 50 spaces with access via Bridget Avenue.
- Kiss and drop zones and bus bays along Birchfield Drive.
- Open play space including a sports courts and sports field.
- Associated utilities and services including a 1000kv padmount substation.
- Main pedestrian entrance to be located off Birchfield Drive.
- Secondary pedestrian access from Bridget Avenue.
- Public domain/off-site works including the removal of street trees.

The design has been masterplanned to allow for an additional future stage. The second stage does not form part of this proposal.

Figure 2 provides an extract of the proposed site plan.

Figure 2 Site Plan



Source: NBRs, 2024

2. On-site fossil fuel usage

The Bungendore High School has been designed to minimise operated fossil fuels upon occupation, and to allow for future transition to fossil-fuel free operations. This includes:

- Heating using heat pumps, underfloor radiant heating, and radiant panel heaters
- Domestic hot water from instantaneous electric hot water units
- No emergency backup power generators

The project is fully electric sourcing renewable electricity for all electrical energy use. There is a small component of fossil fuel use in the project. Uses of fossil fuels from Day One are as below:

Table 2.1 Operations using fossil fuels from Day One

Item	Day One Energy Source	Reason
Science lab Bunsen burners	Bottled Liquefied Petroleum Gas (LPG) gas	DoE requirement for gas Bunsen burners as there are two experiments within the current curriculum calling for their use. It is expected that the use of gas for Bunsen burners will typically contribute to a small percentage of a building’s operational energy greenhouse gas (GHG) emissions. The annual emissions of these equipment will be quantified by the Contractor in the next project stage.
50% of Vocational Education and Training (VET) kitchen cooktops	Bottled LPG gas	DoE requirement for 50% of VET kitchen cooktops to be gas powered as it is part of the current curriculum.

Gas used in the science labs and VET kitchens are designed to be provided by bottled LPG gas in order to allow for future transition toward fossil fuel-free operations, to align with the goal of achieving net zero emissions in New South Wales by 2050. The DoE has set a goal of having net zero emissions in operations by 2030. The DoE acknowledges the current gap to electrifying science labs and workshops, and are developing a number of schools to act as precedents to others, in which electric Bunsen burners, etc. are used. In the short-term, the DoE plans to engage with the relevant educational stakeholders to transition the cooking curriculum away from gas use and support teaching staff being trained on electric cooking alternatives.

Evidence of the above-described design to minimise fossil fuel use in operations or to allow for future transition towards fossil fuel-free operations are within the following services documentation:

- ME-BHS-SPC-001 Mechanical Specification
- EL-BHS-SPC-001 Electrical Specification
- 8332 HS Hydraulic Specification

3. Renewable Energy Generation and Storage

The Bungendore High School has been designed to generate renewable energy on site with the following initiatives:

- Solar photovoltaic (PV) generation to rooftop areas – total capacity 70 kWp, with future expansion capabilities to 99kWp. Refer to EL-GHS-SPC-001 Electrical Specification.

4. Energy-efficient design

As a SINSW development, the project has minimum energy efficiency targets as noted in the Education Facilities Standards and Guidelines (EFSG) 2.0. The project is designed to meet these requirements, which include:

- National Construction Code (NCC) Section J building system and façade to comply with deemed-to-satisfy requirements, with total energy consumption to be at least 10% lower than compared to code compliant baseline. Total building's energy consumption reduction must be achieved without including renewable energy generation in the calculation.
- Passive design elements should be maximised to minimise energy consumption, with consideration for air tightness, thermal insulation, thermal bridge free envelopes, high performance windows, and energy efficient mechanical plant.
- Energy efficient LED lighting.
- Maximised natural daylight.
- Natural ventilation to all classrooms.
- All new lighting and HVAC systems to have timed or sensor feedback functionality for energy conservation.
- All new electrical equipment to be at least 0.5 stars above the market average star rating or be recognised as high efficiency under relevant accreditations.

5. Energy Consumption

Calculations of the energy consumption of the building are not yet available. Energy modelling simulation will be carried out during Design Development stage by the Contractor.

The project is registered with the Green Building Council (GBCA) under the Green Star Design & As-Built v1.3 rating tool as GS-6190DA and is committed to achieving a minimum Green Star 4-Star rating. The project is targeting a 20% reduction against a reference building (Credit 15E Reference Building Pathway).

6. Conclusion

In conclusion, Bungendore High School is being designed to minimise the use of fossil fuels upon occupation, and to allow for future transition to fossil-fuel free operations. It complies with the Sustainable Buildings SEPP Section 3.3 (1), 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.

6.1 Mitigation Measures

Table 2 Mitigation Measures

Mitigation Number/Name	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
Emissions quantification	During design finalisation	Annual emissions estimate of Bunsen burners and kitchen cooktops to be quantified by Contractor.	Quantify the percentage of the activity's operational GHG emissions that is contributed by the use of Bunsen burners and kitchen cooktops.
Future PV expansion	During design finalisation	Confirmation of future expansion capabilities to 99kWp system.	Allow future provision of PV to encourage greater renewable energy production on site.

6.2 Evaluation of Environmental Impacts

1. The extent and nature of potential impacts are low and will not have significant impact on the locality, community and/or the environment.
2. Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the environment.