ARUP

Department of Education (DoE)

New High School for Medowie

Net Zero Statement

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Job number 304050-00

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		Name	Enda Seyama-Heneghan	Alex Rosenthal	Edward Caine
		Signature			
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Issue Document Verification with Document ☑

Contents

Cover Note and Certification

This Net Zero statement has been prepared by Arup on behalf of the Department of Education (DoE) to support a Review of Environmental Factors (REF) for the proposed New High School for Medowie (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.

The activity will be carried out at 6 Abundance Road, Medowie (the site). 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 proposed New High School for Medowie.

The proposed activity involves the construction of school facilities on the site for the purpose of the New High School for Medowie. The site contains a densely vegetated area to the southwest corner which is identified as land with high biodiversity values corresponding to the areas of remnant native vegetation (PCT 3995 – Hunter Coast Paperbark-Swamp Mahogany Forest). The existing dwelling house and other structures on the site will be demolished as part of the works. No other works are proposed within this area.

The proposed new school will accommodate 640 students in 29 permanent teaching spaces including 3 support teaching spaces across 3-storeys of buildings on the site. The proposed activity be delivered across 1 stage, and will consist of the following: 29 permanent teaching spaces including 3 support teaching spaces, to accommodate 640 students, and school hall to accommodate 1,000 students. Approximately 10,500 sqm of GFA is proposed.

- Main vehicular ingress and egress to Ferodale Road to the north, with a new pedestrian and vehicle crossing proposed.
- Main pedestrian access to Abundance Road.
- Kiss and ride, and bus drop and pick up areas to Abundance Road (6 x parallel spaces).
- New pedestrian wombat crossing to Abundance Road
- Approximately 55 x car parking spaces and 3 x accessible car parking spaces.
- Approximately 70 x bicycle parking spaces.
- Block A (Admin) consisting of administration and learning spaces.
- Block B (Foodtech/Workshop) consisting of food technology rooms and workshops.
- Block C (Hall) consisting of school hall to accommodate 1,000 students.
- Central quad, 1 playing field, and 1 sports courtyard.

The proposed activity will include the following spaces; general learning spaces, General support learning spaces, administrative services, staff areas, gym and canteen, library areas for science, wood and metal, food and textiles, health PE, performing arts, additional learning spaces, student amenities, storage, movement (stairs and covered walkways).

This report has been prepared 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 REF Reporting Requirements

Requirement	Relevant Report Section
Ecologically sustainable development	
Does the ESD Report include a Net Zero Action Plan / Net Zero in operations plan (exact name TBA) that adequately addresses how the activity has been designed to eliminate use of fossil fuels during operations, or how the use of fossil fuels will be minimised and will be eliminated by 2035?	Section 2

2. On-site fossil fuel usage

The New High School for Medowie 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

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 currently 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.
Emergency backup power generators	Diesel fuel	Based on generators and fuel readily available in market currently. 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.

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. DoE has set a goal of having net zero emissions in operations by 2030. DoE acknowledges the current gap to electrifying science labs and VET kitchens, and are developing a number of schools to act as precedents to others, in which electric Bunsen burners and induction/electric cooktops are used. In the short-term, 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. Generators will be considered which will allow alternative types of fuel when available.

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-MH-SPC-001 Mechanical Specification
- EL-MH-SPC-001 Electrical Specification
- 8334 HS Hydraulic Specification

3. Renewable Energy Generation and Storage

The New High School for Medowie 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-MPH-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) 2022 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 Heating, Ventilation and Air Conditioning (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 Buildings v1 rating tool as GS-13033B and is committed to achieving a minimum Green Star 4-Star rating. It is a minimum requirement under this rating level for buildings that operational energy use must be at least 10% less than a reference building, and the project is targeting a 20% reduction against a reference building (Credit 22 Energy Use – Credit Achievement).

6. Conclusion

In conclusion, the New High School for Medowie 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 environment.
2. Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the environment.