19 June 2024

Stephen Barry
Office of the Independent Planning Commission NSW
Suite 15.02, Level 15, 135 King Street
Sydney NSW 2000

Dear Stephen,

Birriwa Solar and battery project: Response to questions on notice and Request for Additional information

ACEN Australia (ACEN) is pleased to provide detailed responses to questions on notice and the request for additional information regarding the Birriwa Solar and Battery project (the project).

- **Risk of potential fires caused by solar farms and associated infrastructure**

ACEN projects have not encountered incidents where infrastructure has caused fires, but we recognise that introducing energy generation infrastructure in areas already prone to bushfires could increase potential ignition sources. During a meeting in July 2023, the NSW Rural Fire Service (NSW RFS) provided examples of a solar project that experienced several fires due to short-circuiting and ignition of grassland within the arrays, likely caused by substandard wiring connections and inspections.

ACEN is committed to taking bushfire risk very seriously and will adhere to all relevant standards and best practices for the project. ACEN will work with tier 1 contractors for the delivery of electrical infrastructure, cabling work, and ongoing maintenance of at-risk infrastructure.

ACEN is comfortable with all recommendations provided by NSW RFS at all stages of the Development Application and with the recommended conditions of consent. This includes establishing an Asset Protection Zone (APZ) of at least 10 m around the perimeter of the infrastructure, bushfire fuel management through agricultural practices such as grazing, cropping and hay making, dedicated static water supply for bush firefighting purposes including a 50-80 kilolitre (kL) capacity steel tank supply for the project. The construction access would be maintained for the life of the development to facilitate access by NSW RFS who will have access to the site.

ACEN will prepare an Emergency Response Plan in consultation with the local NSW RFS prior to commencement of construction of the project.

ACEN will also continue to coordinate with EnergyCo and the Network Operator on cumulative impacts within the Central-West Orana Renewable Energy Zone (CWO REZ). This includes coordinating access roads and water supply across the CWO REZ projects as part of broader strategic bushfire emergency planning.

Drawing on ACEN's New England Solar project, which is already operational, ACEN is implementing additional risk mitigation measures beyond project approval conditions demonstrating our willingness to consider additional measures that further mitigate bushfire risk.

For example, ACEN partnering with Macquarie University and CSIRO on a research program that uses high-resolution satellite image processing to monitor fuel loading and manage vegetation.

- **Solar panel degradation**

Whilst solar panel performance would decrease over their typical lifespan of more than 25 years, the modules are not anticipated to physically degrade over the project's lifetime and are accompanied with a manufacturer warranty.

As outlined in the project's Response to Submission report, the PV modules will most likely use polycrystalline or monocrystalline wafer technology. Modern crystalline solar panels of the type that will be used for the project do not contain heavy metals. Recent studies[1] have found no examples of solar panels for utility-scale development that contain arsenic, gallium, germanium, or hexavalent chromium. A small share of panels contain trace amounts of cadmium, but this is a form of the metal that is stable and not a danger to human health.

All of the PV panels being considered by ACEN for the project are manufactured by tier 1 suppliers, which make products meeting all the relevant international and domestic standards. The solar component of the project will be constructed by a leading Engineer Procurement and Construction (EPC) contractor(s) using modern tier 1 PV panels that have passed the due diligence of ACEN and its financiers. Solar panel production, installation and performance will be closely monitored. As an example, during the tendering process for ACEN's Stubbo Solar project (currently under construction) ACEN engaged a third-party auditor to visit manufacturing facilities as part of business quality control assurance processes.

- **Impact on local waterways and water quality**

As outlined in the project's Development Application, flood modelling results show that the project is likely to result in a minor increase in the volume of surface flow being discharged from the study area. In order to mitigate the impact, the development footprint and preliminary design have considered flooding constraints and make appropriate responses in terms of locating flood-sensitive facilities (e.g. substation and BESS) away from watercourses and areas of high hazard flooding and/or erosion. Array areas have also adopted appropriate setbacks from mainstream flooding and higher order watercourses. In addition, during construction, temporary site works, compounds, storage areas and plant and equipment will be located outside of flood prone areas, where practicable.

Prior to construction commencement, ACEN will develop a Soil and Water Management Plan, which includes an Erosion and Sediment Control Plan. As part of best practices, ACEN ensures that site-specific erosion and sediment control plans are designed by a Certified Professional in Erosion and Sediment Control (CPESC) and subsequently reviewed by a third-party CPESC.

ACEN is also willing to undertake appropriate revegetation efforts along mapped third-order watercourses within the development footprint, specifically within the 30-meter buffer designated as a 'Restricted Development Area' in the recommended Conditions of Consent. The revegetation will be carried out in accordance with the Guidelines for Controlled Activities on Waterfront Land (DoI 2018) and other relevant guidelines. As part of our Stubbo Solar project, ACEN has reached out to local companies and organisations interested in partnering with us on rehabilitation and revegetation efforts along some of the watercourses within the development footprint. The intent is to prevent further erosion and enhance the ecosystems within the vicinity of the project, even though these efforts are not mandated by the project's conditions of consent.

[1] Mirletz, H., Hieslmair, H., Ovaitt, S. *et al.* Unfounded concerns about photovoltaic module toxicity and waste are slowing decarbonization. *Nat. Phys.* **19**, 1376–1378 (2023). https://doi.org/10.1038/s41567-023-02230-0

- **Local employment and materials**

ACEN's strategy is to source project workforce and materials locally where possible in the first instance so as to keep the economic and social benefits local. Additionally, this is to also limit the impact on regional housing affordability and use of short stay accommodation in the region which may negatively impact the region's thriving tourism industry.

Our track record in engaging local Small and Medium Enterprise (SME) and people on our projects is highlighted below:

- For Stubbo Solar, as of May 2024, approximately $44M has been spent on goods and services with SMEs within the Mid-Western Regional Local Government Area (LGA)
- For New England Solar, as of May 2024, approximately $1.8M has been spent on goods and services with SMEs within the Uralla, Armidale and Tamworth Local Government Areas.
- For Stubbo Solar and New England Solar, examples of goods and services sourced from local businesses include:
    - Engineering
    - Underground electrical works
    - Fleet vehicle maintenance
    - Civils and earthworks
    - Traffic control
    - Site security
- For New England Solar Stage 1 construction, local employment of 80%
- For Stubbo Solar construction (as of June 2024), local employment of 20%

While a similar strategy to promote local participation will be applied for the project, we acknowledge there are challenges in doing so due to the limited capability and projected demand on people and SMEs from a growing renewable energy industry in the CWO REZ. Despite this, ACEN will continue to work with EnergyCo to contribute to industry wide solutions to addressing these challenges.

- **Workforce using the local road network**

Prior to the commencement of construction, ACEN will prepare a Traffic Management Plan detailing the conditions of access to the site along the approved route, including for workers accessing the construction site and the workers' accommodation facility. The enforcement of the plan will be supported by the installation of signage and cameras, as agreed upon with local councils or relevant road authorities. Awareness of these routes will be included in inductions and communicated to delivery drivers. Workers caught using prohibited or restricted roads may have their induction revoked and be removed from the site.

- **Viability and logistics for livestock grazing during operation**

ACEN is already demonstrating a model for the coexistence of grazing and solar generation through its New England Solar project. Stage 1 of New England Solar commenced generating in 2023 and since this time, more than 6,000 merinos and cross breeds are now rotating on and off the 1,200 hectare project site. The solar grazing is supported by a 'Grazing Protocol' between ACEN and landholders which sets out agreed processes and dual responsibilities for the safe coexistence of grazing and solar generation. Testimonials from landholders on solar grazing at New England Solar can be viewed here: https://acenrenewables.com.au/2024/04/from-solar-farm-to-fashion-house-new-england-solar-grazing-fleece-destined-for-export-success/

Additionally, ACEN is supporting a research program in partnership with Macquarie University and CSIRO that amongst other topics will monitor the effectiveness of grazing compatibility measures and vegetation management practices over time, providing for adaptive management strategies to balance the needs of grazing livestock and vegetation growth within agrivoltaics systems.

Based on this successful experience, our intent is to apply a similar approach for the project.

- **Potential of extended construction period due to workforce shortage**

Despite all best efforts, the construction phase may need to be extended due to unforeseen external factors beyond the project's control, such as sustained adverse weather events, temporary construction workforce shortages, skills shortages, supply chain logistics issues, or other emergencies. ACEN and the community have a shared interest in completing the project as efficiently as possible to minimise any temporary impacts on the amenity of affected residents.

With the ongoing construction of the Stubbo Solar project near Gulgong and the New England Solar project also in NSW, ACEN has gained valuable experience in engaging with workforce and contractors. This experience will provide ACEN with an advantage in the construction of future projects in the region. In addition, ACEN will explore synergies by engaging with contractors across all its projects within the CWO REZ.

While New England Solar Stage 1 construction experienced delays due to extreme out of season wet weather, coupled with COVID-19 restrictions, access to workforce was not considered an issue. Stubbo Solar is still currently in construction and on track in accordance with Development approval conditions.

- **Accuracy of photomontages**

A photomontage is a tool used to evaluate the visual impact of a proposed project. As such, the photography and creation of the photomontage adheres to the Visual Representation of Wind Farms Guidance Version 2.2 (SNH 2017) to ensure an accurate assessment. The photomontages were prepared using the best practice techniques at the time. These practices are in line with those required in the Large-Scale Solar Energy Guideline (DPE 2022), and Technical Supplement – Landscape and Visual Impact Assessment (DPE 2022).

Every effort was made to ensure the photomontages were as accurate as possible with the information available. None of the photomontages were modified to illustrate the development as less prominent.

- **Management of screen planting**

The proposed vegetation planting will provide screening in two stages.

- The shrubs will grow quickly, providing effective screening within 3-5 years. These shrubs are expected to reach a height of approximately 5m, making them ideal for viewpoints close to the project’s boundary. Although they grow rapidly, their lifespan is limited to 5-10 years, depending on the species. The Development Application has included a mix of fast-growing plants to ensure rapid screening, as well as slower-growing species to ensure longevity. Replanting some of these shrubs may need to be included in the maintenance regime.
- The trees will take longer to establish and will begin to provide screening after approximately 5 years, depending on their size at the time of planting. With higher canopies, the trees will offer screening for viewpoints at greater distances. Additionally, the trees have a longer lifespan than the shrubs and are expected to outlive the project's duration.

A maintenance regime will be developed as part of the project's Environmental Management Plan during both construction and operation phases. The ACEN operation and construction team will monitor the screening throughout the project's duration. Maintenance activities, such as supplementary planting or trimming, will be performed as needed by ACEN.

ACEN has been successfully establishing vegetation screening at its New England Solar project near Uralla. The vegetation screening comprises 1,632 seedlings of local native plant species, including an equal distribution of medium-sized eucalypts, tall shrubs, and medium-sized shrubs. The planting is taking place on the northern boundary of the site within the project boundary, as agreed with neighbours and in accordance with the conditions of consent. A supplier based in the New England region was responsible for the vegetation planting in September 2022, prior to the commencement of operations. The process includes ongoing maintenance of the screening, such as weed control, watering, and the replacement of any plants that did not establish correctly. As of June 2024, the vegetation screening has reached a height of more than one metre.

- **Determination of proposed screen planting**

The extent of screen planting was based on the width of the view from the viewing location. That is, views from a residence will be screened to the extent that the screen covers the width of the visible solar infrastructure.

In the case of a road, the planted screens along the road are intended to match the existing roadside vegetation and will allow some visibility while screening the majority of the infrastructure. Roadside planting was only proposed along key routes (i.e. the Central West Cycle Trail) in areas with no existing planting and to maintain the continuity with existing roadside vegetation along Birriwa Bus Route South.

Regarding the possibility of planting within the setback area north of dwelling A2, screen planting is proposed along the development footprint boundary to the north and northwest of A2. This aims to mitigate visual impact on neighbouring residences R1 and R1A. ACEN has agreements with the landholders of A2 for project-related land uses, including vegetation screening, but ACEN does not have agreement from the local council for planting within the road reserve. Screen planting was not proposed in the setback area north of A2 because the visual assessment did not identify it as necessary, with no privately owned residences directly north of this area.

- **Isolated trees and remnant vegetation within the development footprint**

The project site was chosen due to its highly disturbed nature, resulting from extensive agricultural use over time and minimal remaining vegetation. An assessment of the project's potential impacts on biodiversity and remnant vegetation has been conducted through a Biodiversity Development Assessment Report (BDAR), which includes evaluations of native vegetation and habitat mapping, as well as targeted flora and fauna surveys. Most of the impacts on native vegetation will occur along local access roads, meeting safety and traffic requirements and aligning with requests from local councils. The development footprint has been planned to avoid areas of higher biodiversity significance and will not encroach upon existing roadside vegetation beyond the areas designated for road upgrades.

ACEN is seeking approval for the removal of isolated trees and remnant vegetation within the development footprint. However, the final design may incorporate further avoidance measures if compatible with the layout of PV arrays or as necessitated by additional biodiversity surveys to be conducted as part of a Construction Biodiversity Management Plan.

- **Dedicated building for Battery Energy Storage System (BESS)**

ACEN is considering three different types of enclosures for the proposed BESS: containerised (option 1), outdoor rack (option 2), or indoor rack within a building (option 3). If selected, the dedicated use building (option 3) would have an indicative footprint of 9.4ha and a height of approx. 7m, subject to final design. Regardless of the final chosen design, the BESS units will be installed and meet requirements of applicable Australian Standards and other applicable codes and standards such as the National Fire Protection Association (NFPA) 855 *Standard for the Installation of Stationary Energy Storage Systems*. Where a dedicated use building is used for BESS installation, this also includes the National Construction Code requirements. The BESS units will also be tested and certified to UL 9540A *Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems.*

The environmental impacts of each BESS design option was assessed within the EIS in terms of all environmental matters, as follows:

- Hazard and risk - a hazard and risk assessment was conducted in accordance with *Hazardous Industry Planning Advisory Paper No 6 - Guidelines for Hazard Analysis* (NSW Department of Planning 2011).
- Assessment of the potential impacts relating to flooding, biodiversity, soils and heritage were all undertaken across the entire development footprint, of which the BESS is a part of.
- Noise and visual – the BESS was specifically included in the noise and visual models of the project. Further details on these aspects are provided below.

Visual

The visual impacts of the BESS locations were assessed by including the BESS as part of the solar infrastructure. The visual impact assessment (VIA) assumed 7 m high sheds would house the BESS infrastructure and included the structures in the photomontages.

In relation to screen planting, there are no non-associated receivers close to the BESS locations so no dedicated screen planting was proposed. Further, the roadside planting near the BESS locations will screen the views from the roadways, and therefore no additional screening along the roads is proposed.

Noise

Importantly with respect to the noise assessment, the BESS was assumed to be in the worst-case location within the two proposed operational infrastructure areas; i.e. adjacent to A6 for BESS area A and A4 for BESS area B. The indicative location of the proposed noise wall for this worst-case scenario was also identified, as shown on the project layout figure.

Assumptions relating to the BESS were based on data provided by the proposed manufacturer, and incorporated in the noise model as follows:

- Containerised solution
    - 161 containers each with 4 heating ventilation air conditioning (HVAC) units rated at 78 dBA at 1 metre
    - 161 power conversion unit (PCU) skids rated at 79 dBA at 1 metre
- Non-containerised solution
    - 1622 outdoor racks, each rack rated at 66 dBA at 1 metre
    - 165 PCU skids rated at 79 dBA at 1 metre

In addition, both options assumed the inclusion of three HV transformers with a rated sound power level of 98 dBA.

Overall, ACEN recognises that the dedicated building option has potentially higher environmental impacts than other enclosure options. Additionally, enclosure options 1 and 2 are standardised for compliance with fire regulations and codes, making them transferable across various projects. Therefore, ACEN is more likely to select option 1 or option 2.

- **Subdivision allotment areas**

Subdivision may be necessary for the establishment of the Network Operator's switchyard within the project's development footprint. The precise area and location of the switchyard will be determined during the final design stage, but it is anticipated to occupy approximately 5 hectares and will be situated within the lots delineated on the Subdivision plans outlined in the recommended Conditions of Consent.

- **Movement of livestock on public roads**

During construction, especially during upgrades to the local road network along the proposed access route, temporary traffic restrictions and limitations on the movement of livestock on public roads may occur. ACEN will engage in consultations with affected surrounding landowners to ensure the coordination of all construction activities, minimising any adverse effects on livestock movement on public roads. However, such impacts are not anticipated during the operation of the project.

Yours sincerely

Cédric Bergé
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ACEN Australia