Chris Smith & ASSOCIATES PTY LTD

■ CIVIL ENGINEERS ■ LAND SURVEYORS
■ URBAN & REGIONAL PLANNERS ■ PROJECT MANAGERS

Approved Company
ISO 9001 - Quality System Management System
ISO 14001 - Environmental Management System
ISO 45001 - OH&S Management System

Submissions Report

Sub-5 MW Solar Farm

2773 Berecry Road, Tharbogang

ACENERGY

Rev. 0 | July 2023 Ref: 23081

Level 1, 135 Fryers Street, Shepparton, Vic, 3630
Telephone (03) 5820 7700 Facsimile (03) 5822 4878

■ Visiting Offices: ■ Shop 3, 11-13 Sydney Street, Kilmore, Vic. 3764 ■ Ph: (03) 5781 1939
■ Suite 7, 33 Nish Street, Echuca, Vic. 3564 ■ Ph: (03) 5482 9100

Document Ref: 23081_Submissions Report_ACEnergy Solar Farm_Tharbogang_240723

Table of contents

1 Introduction

Development Application DA93/2023 was placed on public exhibition for 14 days in accordance with the Environmental Planning and Assessment Regulations. During this period, we understand that Council received a total of ten (10) unique submissions:

Upon review of the content of these submissions, we understand that many of these are from serial objectors to renewable energy projects across regional NSW. These objections are submitted verbatim to several others published on the NSW Government's major projects website. Consequently, these submissions do not raise any issues specific to the current proposal or in any relevant context. Instead, these objections are submitted on ideological grounds.

Despite this, we have divided the objections into those that are matters for consideration under section 4.15 of the Environmental Planning and Assessment Act 1979, and other matters that are not valid heads of consideration.

To this end, we have grouped the perceivably valid matters for consideration under section 4.15 into nine (9) categories, listed below, which are in turn addressed further in section 2 of this report:

1. Bushfire risk
2. Environment hazard and risks
3. Social and economic impacts
4. Biodiversity impacts
5. Noise impacts
6. Soil and water contamination
7. Visual impacts
8. Waste management
9. Cumulative impact of the proposal

Conversely, *the following grounds of objection raised by submitters are not considered to be valid matters for consideration under section 4.15*:

- Inadequate consultation.
- Overall environmental footprint / lifecycle cost of the proposal.
- Panels are not manufactured in accordance with *the Commonwealth Modern Slavery Act 2018*.
- Impact to the Uyghurs and Democratic Republic of the Congo residents.
- The proposal is uneconomical.
- The solar panel glass cannot be recycled.
- Proposal is unnecessary due to climate change not being real.
- Landowner would not be treated justly by the applicant.
- Proposal would lead to cyber security breaches and/or national security threats.
- Speculation on breaches of National Intelligence Law.
- The proposal being dependent on weather.
- The proposal damaging the economy.
- Would cause an increase in electricity prices, leading to social impacts

These grounds for objection are considered invalid for myriad reasons. However, for the most part, they fall outside the role of town planning, they are governed by other statutory instruments, or are assertions without widely accepted facts.

To support our response, we have attached the following documents, which are provided in addition to the originally submitted documents that comprised the initial development application:

Document	Dated	Author
Agricultural Assessment Report	13 July 2023	Meridian Agriculture
JA Solar – hail test report – 45mm ice ball	14 April 2020	TÜV SÜD
JA Solar – solar panel Material Safety Data Sheet	February 2017	JA Solar
Sungrow BESS – fire test report – container side wall	18 July 2022	Shanghai Global Testing Services Co., Ltd.
Sungrow BESS – fire test report – thermal runaway – container	2021	TUVRheinland
ACEnergy Response to "Toxic Solar Panel Materials"	2023	ACEnergy

2 Response to Public Submissions

This section considers the issues raised in the public submissions and provides a response to each issue, rather than each submission.

1.1 Bushfire Risk

The proposal would increase the risk of bushfire.

The site and locality has mostly been cleared for prolonged agriculture. Some trees exist along roadsides, as hedgerows, and around dwellings. There are no dense areas of trees in the locality that would fuel a bushfire. Due to this, the primary fire risk at the site would be grass fire from nearby paddocks (as opposed to forest fire or another type of wildfire).

The development site is currently used for irrigated cropping, which poses a low risk of causing or spreading bushfire. In this landscape context, the primary risk of fires occurs during harvest when machinery and vehicles move through cropped paddocks.

A bush fire management and emergency response plan has been prepared for the proposal, which concludes that the proposal would not significantly increase the risk of bushfire compared to the current land use (cropping). The plan includes recommendations for the design and operation of the proposal. These recommendations are detailed in the plan and in section 7.2 of the Statement of Environmental Effects (SEE) for the proposal.

To address these concerns, further information is provided below in relation to the risk of fire from BESS.

Fire risk from BESS containers

The proposed BESS containers are a type of lithium iron phosphate (LFP) battery. LFP batteries are relatively insensitive to thermal runaway effect compared to other battery chemistries.

A thermal runaway test has been undertaken for the proposed BESS and is attached to this report. If a fire ignites within the BESS, the containers have multiple built-in fire protection devices that work collaboratively, including smoke and thermal sensors,

combustible gas detector, pressure relief system, and aerosol fire extinguishing system. This system will automatically suppress an internal fire.

The below figure shows a typical arrangement for fire safety devices within a BESS container. Should a fire ignite within one of the BESS containers, it would not transfer to nearby containers due to the fire safety design features.

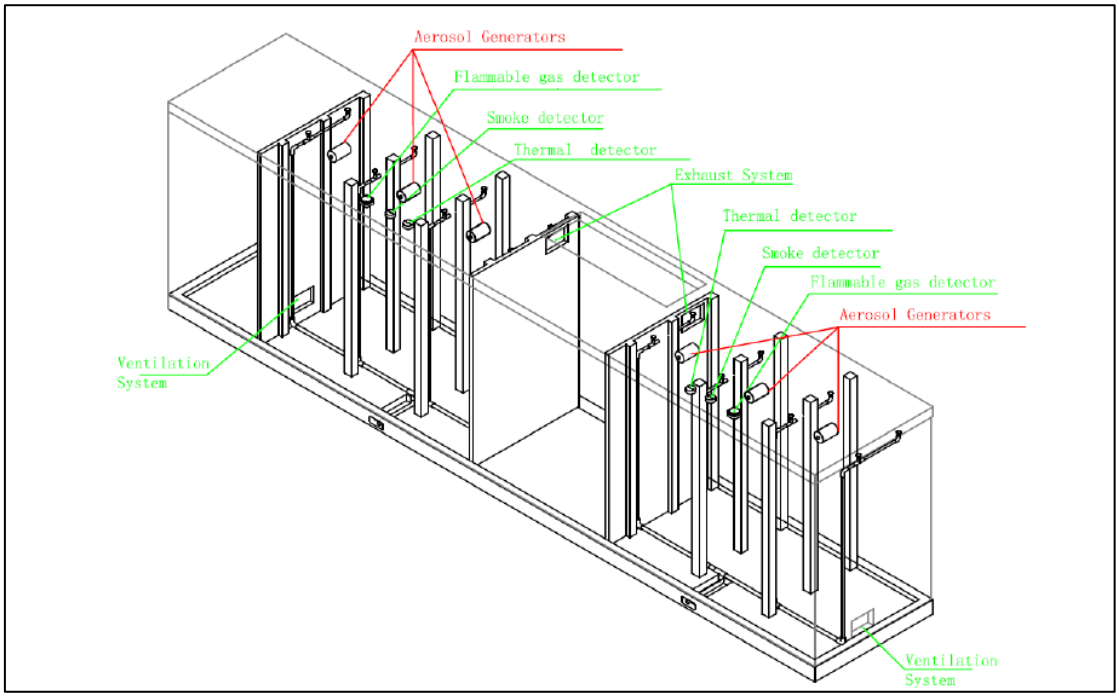

Figure 2-1: Fire detection and suppression system – Sungrow ST2752UX

In the event of a fire, the smoke would be toxic.

The ignition of any manmade structure or chemical has the potential to create toxic smoke. In the event of a fire, the risks would be like those of a building fire, which also has the potential to create toxic smoke.

Solar panels are typically comprised of non-metallic materials such as silicon, mono- or polycrystalline silicon, glass, composite film, plastic, and epoxies, with an anodised aluminium frame. The type of panels used for solar farms are the same as those used for domestic rooftop solar and are not considered to pose any specific hazards in the event of a fire.

All major electrical infrastructure and supporting structures have an extremely low chance of catching fire in a bushfire event.

Major electrical infrastructure (Medium Voltage Power Station container and BESS container) are enclosed containers with steel housing, designed to withstand fire to a great extent. Solar trackers are made of steel, which are non-combustible. The rapid adoption of bi-facial solar panels means the final panel product selected for this proposal is likely to be bi-facial as well. Such panels are more resistant to fire than mono-facial counterparts, given the double-glass design not exposing combustible materials.

The risk of the solar farm producing toxic smoke is thus extremely low.

1.2 Environmental Hazards and Risks

Health impacts from electromagnetic radiation generated by the proposal & solar panels increasing ambient temperatures.

Section 7.5.1 of the SEE addresses the potential impacts of electromagnetic radiation. The conclusion is that the proposal is not expected to cause any adverse impacts through the emission of electromagnetic radiation.

Health impacts from stress due to living close to a solar farm.

The stress due to living close to a solar farm is only realistic when it is linked to valid health and safety concerns of the proposed solar farm. These concerns include hazardous materials, noise, bushfire, etc., which have been addressed in Section 7 of the SEE. A uniform conclusion is reached that the proposal is not expected to cause significant adverse impacts in those aspects if relevant proposed safeguards are implemented. The conclusions are supported by research and/or independent site-specific assessment reports. Therefore, any nearby residents with potential health and safety concerns are encouraged to read the SEE and its appendices to alleviate any stress due to misunderstanding of the solar farm impacts.

Furthermore, the proposed safeguards (or mitigation measures) can be conditioned in the planning permit to be enforced during construction and/or operational stages. Therefore, potential adverse impacts will be controlled and minimised.

1.3 Social and Economic Impacts

Use of irrigated farmland for non-agricultural purposes.

After construction of the solar farm, the development site would be revegetated with pasture species, and groundcover would be maintained for the life of the facility. The land would be capable of being used for grazing, which would serve to keep the grass maintained and to reduce weed growth.

The proposal is not considered to create a complete loss of high-quality agricultural land, as agricultural activities will continue albeit at via alternative agricultural pursuits. The natural resource base of the site will be maintained with the proposed use not considered to conflict with adjacent land uses. During the decommissioning phase, all infrastructure would be removed from the site, including underground cabling.

Section 7.7 of the SEE addresses the potential impacts of using irrigated farmland for non-agricultural purposes. To support the information in the SEE, ACEnergy has engaged Meridian Agriculture to undertake an Agricultural Impact Assessment to be prepared for the proposal. The assessment found that:

- The loss of production from the site during its planned 30 year life is negligible in terms of regional and state crop production.
- The proposed solar farm at this site would have no long term detrimental effect on the productive capacity of the soil, nor would it have a significant impact on the overall productivity of the region or state, nor impact on the ability of neighbouring businesses to operate

The proposal has no benefit to the environment, Griffith, or Australia overall.

The proposal would connect to Essential Energy's 33kV, which supplies electricity to the area between Tharbogang and Goolgowi, which supports significant electricity demand from local agricultural industry, notably the local chicken farms which are large consumers of electricity.

Essential Energy's regulatory Distribution Annual Planning Report (2021, p. 159) highlights that this feeder is reaching maximum demand capacity.

The proposal would feed 4.95 MW into the electricity grid and provide about 11 MWh of electricity storage to meet peak time demand. The proposal would avoid the need for Essential Energy to enact demand management measures in the area. This would allow businesses in the area to grow without any limitations on electricity supply.

1.4 Biodiversity Impacts

Impacts to the River Red Gum trees along Tyson Lane from the change from irrigated cropping to a non-agricultural land use.

The flora and fauna assessment report for the proposal found that the development would not impact the river red gum trees along Tyson Lane in any way.

Changed conditions of a dryland paddock to irrigated rice field and alleviate the effects of salinity from a rising water table.

The transition of 15 ha of farmland from irrigation to temporary dryland is not expected to increase salinity in the locality.

Rather contrarily, ongoing irrigated agriculture requires a greater level of monitoring to manage salinity via potential impacts on water table condition.

Construction and/or operation of the proposal would spread weed seeds.

The flora and fauna assessment for the proposal identified 31 exotic plant species within the development site, including three (3) weeds of national significance. The assessment recommends safeguards to reduce weed spread during construction and operation of the proposal.

In addition, the construction environmental management plan (CEMP) for the proposal will include the following weed management guidelines:

<u>Controls</u>

- All personnel shall receive weed hygiene awareness training as part of the site induction.
- All vehicles, machinery and plant are cleared prior to the first entry to the site.
- A weed hygiene declaration shall be provided by the supplier for all organic materials (etc. soil, sand, mulch, gravel, road base, seed etc.) brought to site.
- All green waste from vegetation clearing and excess soil shall be retained on site.
- Only registered herbicides shall be used by a licensed weed sprayer in accordance with the *Agricultural and Veterinary Chemicals Code Act 1994* (New South Wales).

<u>Monitoring</u>

- Regular site inspections shall include identifying evidence of significant infestations of noxious weeds.

Reporting

- Pre- and post-construction weed survey reports shall be prepared. The main set down area and vehicle parking and equipment storage area shall be inspected for noxious weeds each monitoring visit.

1.5 Soil and Water Contamination

Hail damage to the panels and contamination of soil and water.

Refer to "ACEnergy response to toxic solar panel materials.pdf" for details.

1.6 Waste Management

After decommissioning, Council waste management facilities would not be able to receive/process the waste materials, which would be left on the site.

Most of the facility components have salvage value. All recyclable materials, salvaged and non-salvage, will be recycled to the furthest extent possible. All other non-recyclable waste materials will be disposed of in accordance with state and federal law in an approved licensed solid waste facility. Solar panels will have value in a resale market, decreasing over the life of the facility.

Solar panels

During decommissioning, the panels will be deactivated from the surrounding electrical system to make them safe for disassembly. The panels will then be removed from the site.

At the time of decommissioning, panels in working condition may be refurbished and sold in a secondary market. If this is not possible, the panels would be recycled at a licenced solar panel recycling facility. Currently there are at least five operators in Australia:

- Reclaim PV
- PV Industries
- SolaCycle
- Ecoactiv
- Lotus Energy (refer Figure 2-2)

Figure 2-2: Lotus Energy's solar panel recycling plant

Source: (Lotus Energy, 2022)

Tracking system and support

The decommissioning process for the tracking system is:

- Liquid wastes, including oils and hydraulic fluids, will be collected and properly disposed of or recycled according to regulations current at the time of decommissioning.
- Electronic components and internal electrical wiring will be removed and salvaged.
- The steel piles will be pulled out or cut and removed to a minimum depth of 1 m below the ground surface.

The steel foundations and steel components from the tracking system can be salvaged and sold.

Battery containers

During decommissioning, the battery containers will be deactivated from the surrounding electrical system and made safe for disassembly.

Central inverter station and HV Kiosk

During decommissioning, the central inverter station and HV Kiosk will be de-energised, cut from their steel foundations and removed from the site. Depending on the condition, the equipment may be sold for refurbishment and re-use. If not re-used, they will be salvaged or disposed of at an approved solid waste management facility. Oils, liquids and lubricants will be collected and disposed of at a licensed facility.

Electrical cabling and conduits

The underground electrical collection system will be installed at a depth of 0.6m or deeper. During decommissioning, cabling will be removed and recycled. The system will not interfere with future farming activities because of the depth. At the time of decommissioning, the cables can be removed and recycled.

Cable recycling involves separating the cable insulation from the metal so that the components can be reused. The below figure shows cable insulation and other solar farm components after recycling.

Figure 2-3: Cable insulation and other solar farm components after recycling

Source: (Lotus Energy, 2023)

The components would create toxic waste that needs to be disposed of.

An assessment against *State Environmental Planning Policy (Resilience and Hazards) 2021* was prepared for the proposal, which confirms that none of the components contain any of the hazardous materials listed in the NSW Department of Planning's 'Hazardous and Offensive Development Application Guidelines - Applying SEPP 33.'

Concern that power sources are needed in major city areas instead - avoiding long distance transmission loss.

This a sub-5MW renewable energy proposal that would be connected to the local 33kV distribution network.

As detailed at length within the original application, the electricity generated and stored on the site would be exclusively for local use. Consequently, there would be no long-distance transmission of electricity to or from the proposal.

1.7 Cumulative Impacts

Construction of additional transmission lines.

The proposal involves the installation of a overhead line from the HV Kiosk to the existing 33 kV power line on Brown Road. The construction of this overhead line and three (3) poles is not reasonably expected to cause any adverse environmental impacts.

Reduce available farmland.

NSW has around 80 million ha of land, of which 2.8 million ha is identified as State Significant Agricultural Land on the draft map.

To provide a point of reference, the currently proposed Dinawan Solar Farm, by Spark Renewables, would provide 1 GW of electricity over a development footprint of 2,500 ha. This project along would contribute one-twelfth of NSW's energy target.

If the entire 12 GW renewable energy generation target in the NSW Electricity Infrastructure Roadmap (2020) was provided by large-scale solar farms like the Dinawan Solar Farm, and placed on State Significant Agricultural Land, it would cover about 30,000 ha, equating to 0.000375% of NSW's total available farmland, or 1.07% of State Significant Agricultural Land.

Therefore, it is unreasonable to anticipate that solar farms would significantly reduce NSW's farmland.

Would cause electricity supply to become unreliable, leading to social impacts.

Medium scale generation (including micro solar)

Small rural settlements in NSW are typically provided with electricity via 330 kV or 132 kV transmission lines which connect to the closest power stations. The electricity is stepped down at the local substation and distributed throughout the local area via 11 kV, 22 kV or 33 kV distribution lines.

Due to the location of some of these settlements, the closest power station may be over 100 km away. This is inefficient because when electricity is transported through transmission lines, some of it is lost as heat (AEMC, 2023).

Electricity can be efficiently provided to these settlements by medium scale generation, which typically consists of solar farms and BESS of less than 30 MW export capacity. They provide electricity to the local area via the local transmission network (11 kV, 22 kV or 33 kV).

The most common type of medium scale generation is micro solar, which consists of ground-mounted installations with an export capacity of up to 4.99 MW. A micro solar farm can generate enough electricity to power approximately 1,000 homes. It can be coupled with BESS (typically of 10 MWh in storage capacity) to meet peak-time demand.

The use of micro solar can reduce a community's need to import electricity over long distances. This, in turn, reduces the need for electricity distributors to construct and maintain higher-voltage transmission lines (330 kV - 132 kV).

Small scale generation

Small scale generation mostly consists of 'behind the meter' technologies such as rooftop solar, small-scale battery, and small-scale wind turbines. These technologies are used to power homes, commercial buildings, factories, farms, and electric vehicles. Increasingly, communities are looking to new local renewable energy technologies and models, like trading energy and sharing solar energy with their neighbours, which can help reduce energy bills and stabilise the grid. Electric vehicles – which both use and store energy – are becoming increasingly common.

3 Conclusion

The assessments and information in the DA and in this submissions report demonstrate that the proposal is justified and worthy of approval based on:

- The proposal is permissible and meets all relevant planning requirements.
- The proposal would avoid the need for demand management measures to be implemented by Essential Energy due to 33kV feeder 79W reaching peak demand.
- The installation of micro solar farms and associated batteries, such as the proposal, would serve to alleviate the demand on 33kV feeder 79W, allowing for increased capacity to be used for economic activity bringing benefit to the local area.
- The identified impacts are generally minor, highly localised, capable of mitigation or offsetting and often confined to the construction phase.
- The development site is highly suited to solar electricity generation, with adequate capacity in the local transmission network and a high quality local solar resource.
- The proposal provides an important contribution to the urgent need to abate carbon emissions in the electricity sector.
- The proposal offers a range of community benefits relating to electricity supply, economic activity, and local employment opportunities.
- The proposal is reversible and would not result in any permanent loss of land use potential or restrict future land and resource use options.
- The proposal would not significantly affect local or regional agricultural production, in terms of area, production quantities or economic value.
- The proposal would not have any significant adverse impacts on any neighbouring dwellings or land uses.

The development site provides a high-quality solar resource, flat, stable and low-risk terrain, good road access and locally available transmission lines.

The proposal is consistent with the objects and matters for consideration in the EP&A Act, and with the principles of Ecologically Sustainable Development.

4 References

AEMC. (2023). *Transmission loss factors*. (Australian Energy Market Commission) Retrieved from https://www.aemc.gov.au/energy-system/electricity/electricity-system/transmission-loss-factors

Essential Energy. (2021). *Asset Management Distribution Annual Planning Report*. Retrieved from https://www.essentialenergy.com.au/our-network/network-pricing-and-regulatory-reporting/regulatory-reports-and-network-information

Lotus Energy. (2022). *Lotus Energy*. Retrieved from https://www.linkedin.com/posts/lotus-energy-cmo_here-at-lotus-energy-recycling-it-has-been-activity-6989402927610175488-Vl7Y/?originalSubdomain=my

Lotus Energy. (2023). *LinkedIn*. Retrieved from https://www.linkedin.com/posts/lotus-energy-cmo_circulareconomy-solar-activity-7024166714187681793-DdoU?utm_source=share&utm_medium=member_desktop