Submission the Gundary Solar Farm Project

Due Date: 12 December 2024

Author: Dr Anne S. Smith, Rainforest Reserves Australia

Project Overview

The Gundary Solar Farm, a proposed 400 MW solar energy project with an accompanying Battery Energy Storage System (BESS), is located approximately 10 km southeast of Goulburn, New South Wales, within the Goulburn-Mulwaree Council area. This project spans a vast area of agricultural and semi-rural land characterized by unique flora and fauna. Notable vegetation includes native grasslands and eucalyptus woodlands (*Eucalyptus spp.*), providing habitat for a variety of species.

The region supports several significant species, including:

- **Superb Parrot (*Polytelis swainsonii*):** An endangered bird dependent on hollow-bearing trees for nesting.
- **Gang-gang Cockatoo (*Callocephalon fimbriatum*):** A vulnerable species that relies on mature forests.
- **Glossy Black-Cockatoo (*Calyptorhynchus lathami*):** Known for its specific dietary needs, feeding primarily on *Allocasuarina* species.
- **Eastern Grey Kangaroo (*Macropus giganteus*):** Common in the region but vulnerable to habitat fragmentation.
- **Striped Marsh Frog (*Limnodynastes peronii*):** Relies on the wetlands threatened by project activities.

Local waterways and wetlands, crucial for aquatic species such as native fish and amphibians, are also at risk. Additionally, aquatic invertebrates play an essential role in the ecosystem's health and biodiversity.

Local residents and environmental groups have raised concerns about the project's potential to irreversibly harm this biodiverse region. Despite claims of carbon neutrality, there is insufficient evidence to substantiate the project's net carbon benefits due to a lack of accounting for lifecycle emissions, including material extraction, transportation, installation, and eventual decommissioning.

Key Concerns and Legislative Breaches

1. **Toxic Contamination: **

The materials used in solar panels, wind turbine blades, and BESS systems are laden with hazardous substances such as PFAS, which are resistant to degradation and accumulate in the environment over time. These substances can leach into soil and water, posing severe risks to ecosystems and human health (Kwiatkowski et al.).

- **Legislative shortfall:** Waste management frameworks lack comprehensive guidelines for handling and disposing of PFAS-containing components (Environmental Protection Authority).

2. Biodiversity Impact

The project site is home to endangered and vulnerable species such as the Superb Parrot (*Polytelis swainsonii*), Glossy Black-Cockatoo (*Calyptorhynchus lathami*), and Gang-gang Cockatoo (*Callocephalon fimbriatum*). Habitat destruction, noise pollution, and increased human activity pose significant threats to these populations. Additionally, wetlands and riparian zones could be severely affected by sedimentation and altered hydrology.

- **Legislative breach:** Failure to meet the requirements of the Biodiversity Conservation Act 2016, which mandates adequate offset strategies for impacted species (OEH).

3. Visual and Acoustic Pollution

The proposed development's infrastructure, including towering solar arrays and centralized BESS facilities, will dominate the rural landscape, diminishing visual amenity for residents and visitors. Noise generated during construction and operation may disrupt the tranquility of the area, further reducing its suitability as a residential and ecological haven.

- **Legislative shortfall:** Insufficient provisions under the Environmental Planning and Assessment Act 1979 to protect rural aesthetics and community wellbeing (NSW Government).

4. Traffic and Transport

Construction activities will result in an estimated 200,000 vehicle trips, including heavy trucks transporting equipment and materials. This increase in traffic poses safety risks and may lead to accelerated deterioration of local roads, burdening the community with repair costs.

- **Legislative breach:** Inadequate consideration under the Road Transport Act 2013 for mitigating adverse impacts on local infrastructure and safety (Road Safety Commission).

5. Water Runoff and Soil Erosion

The removal of vegetation and soil disturbance during construction is likely to exacerbate erosion and increase sediment runoff into nearby waterways. This runoff can introduce pollutants and disrupt aquatic habitats vital for native species, including the Striped Marsh Frog (*Limnodynastes peronii*).

- **Legislative breach:** Non-compliance with the Water Management Act 2000 and the Protection of the Environment Operations Act 1997 (NSW DPIE).

6. Heat Island Effect and Climate Disruption

Solar farms are known to contribute to localized heating effects, which can disrupt microclimates and negatively affect nearby agricultural activities. Additionally, the project's claims of carbon neutrality are undermined by a lack of transparent accounting for lifecycle emissions.

- **Case study:** Research highlights the heat island effect created by large-scale solar installations, with measurable temperature increases in surrounding areas (Zhang et al.).

7. Waste Disposal and Decommissioning

Solar panels and BESS components have a limited lifespan, necessitating eventual disposal. However, current recycling infrastructure is insufficient, and toxic materials may end up in landfills, causing long-term environmental harm.

- **Legislative shortfall:** NSW's Circular Economy strategies fail to address the unique challenges posed by renewable energy waste (NSW EPA).

8. Community Health Risks

Noise, chemical exposure, and the potential for fires associated with BESS systems pose direct risks to nearby residents. Health studies, including those by Lynette Lablack, emphasize the dangers of prolonged exposure to low-frequency noise and toxic substances.

- **Legislative breach:** Inadequate safeguards under the Work Health and Safety Act 2011 to protect community health (Safe Work Australia).

Recommendations

1. **Extend Public Consultation Period**
    - Request an extension until at least January 20, 2025, to ensure thorough review and stakeholder engagement.
2. **Comprehensive Environmental Audit**
    - Commission an independent audit to evaluate the project's true environmental impact, including biodiversity, water resources, and carbon accounting.
3. **Reassess Waste Management Protocols**
    - Develop and enforce robust recycling and disposal guidelines for renewable energy components, with a focus on PFAS and other hazardous substances.
4. **Implement Mitigation Measures**
    - Require advanced soil erosion barriers, noise reduction technologies, and expanded buffer zones to protect nearby ecosystems and communities.

Conclusion

The Gundary Solar Farm project poses significant threats to the environment, local communities, and biodiversity. The lack of transparent carbon accounting undermines its claims of contributing to net-zero goals, as lifecycle emissions—from raw material extraction to decommissioning—are poorly documented and underestimated. Furthermore, the project's legislative breaches and inadequate mitigation strategies highlight the risks of proceeding without substantial revisions.

Given the irreversible damage to flora, fauna, and community wellbeing, this project should not proceed in its current form. A shift towards smaller, community-focused renewable energy solutions with rigorous environmental safeguards would better align with Australia's sustainability goals while preserving its unique ecological heritage.

References

1. Brown, P., Jones, R., & Smith, T. Biodiversity Offsets and Renewable Energy Projects: Lessons from Australia. *Journal of Environmental Planning and Management*.
2. Canning, M., Baxter, P., & Wilson, J. The Circular Economy and Solar Panel Recycling. *Waste Management Review*.
3. Environmental Protection Authority. PFAS in the Environment. NSW Government.
4. Huang, S., Zhang, L., & Chen, Y. Heat Island Effects of Solar Farms: A Global Review. *Renewable Energy*.
5. Kwiatkowski, C., Andrews, D., & Naidenko, O. Forever Chemicals: Risks from PFAS. *Environmental Health Perspectives*.
6. Lablack, L. Community Health Risks of Battery Energy Storage Systems. *Australian Health Review*.
7. NSW DPIE. Water Management Policies in NSW. NSW Government.
8. NSW EPA. Circular Economy Strategy. NSW Government.
9. NSW Government. Environmental Planning Guidelines. NSW Department of Planning and Environment.
10. Road Safety Commission. Road Transport and Community Safety. NSW Government.
11. Safe Work Australia. Work Health and Safety in Renewable Energy Projects. Safe Work Australia.
12. Zhang, L., Huang, S., & Li, X. Solar Farms and Local Climate: An Emerging Concern. *Climate Change Journal*.