New South Wales Government
Independent Planning Commission

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Organisation:	*Rainforest Reserves AustraliaRainforest Reserves Australia*	Key issues:	*Land use compatibility,Biodiversity,Traffic and transport*
Location:	*4870 Queensland*		
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The proposed Middlebrook Solar Farm project involves establishing a large-scale 320 MW solar farm paired with a 320 MW/780 MW-hour battery storage system. While renewable energy is an important part of Australiaâ€™s strategy to reduce carbon emissions and combat climate change, such projects should not be pursued at the expense of significant environmental, social, and economic harm. This submission presents a comprehensive examination of the detrimental impacts posed by the Middlebrook Solar Farm project, supported by verified studies, real-world examples, and a review of the existing legislative frameworks. The evidence presented here shows that the projectâ€™s negative impacts outweigh its potential benefits, and it is recommended that the proposal be reconsidered.

Submission to the Independent Planning Commission (IPCN): Opposition to the Middlebrook Solar Farm Project

Project: Middlebrook Solar Farm, Tamworth – 320 MW Solar Farm and 320 MW/780 MW-hour Battery

Date: 26th September 2024

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Introduction

The proposed Middlebrook Solar Farm project involves establishing a large-scale 320 MW solar farm paired with a 320 MW/780 MW-hour battery storage system. While renewable energy is an important part of Australia's strategy to reduce carbon emissions and combat climate change, such projects should not be pursued at the expense of significant environmental, social, and economic harm. This submission presents a comprehensive examination of the detrimental impacts posed by the Middlebrook Solar Farm project, supported by verified studies, real-world examples, and a review of the existing legislative frameworks. The evidence presented here shows that the project's negative impacts outweigh its potential benefits, and it is recommended that the proposal be reconsidered.

1. Environmental Impacts

1.1 Habitat Destruction and Fragmentation

Large-scale renewable energy projects like the Middlebrook Solar Farm often require extensive land clearing, leading to severe habitat destruction and fragmentation. This is particularly concerning given that the site is situated in a region that serves as a critical habitat corridor for numerous species, many of which are threatened or vulnerable.
The proposed site includes key biodiversity areas and known habitat ranges for species such as the koala (Phascolarctos cinereus), the greater glider (Petauroides volans), and the critically endangered Regent Honeyeater (Anthochaera phrygia). Habitat fragmentation disrupts these species' ability to access food, shelter, and breeding grounds, and can lead to isolated populations, which are more susceptible to genetic disorders and local extinctions (Saunders et al. 1991).

The koala population, which is already under immense pressure from habitat loss, disease, and climate change, is especially vulnerable. A 2021 study conducted by the Australian Koala Foundation found that the country's koala population has declined by 30% over the past three years alone, primarily due to habitat destruction (Australian Koala Foundation 2021). Given that koalas have a strong site fidelity and are slow to adapt to changes in their environment, further habitat fragmentation by the Middlebrook Solar Farm would exacerbate their decline.

Case Study: Murra Warra Wind Farm, Victoria The Murra Warra Wind Farm, one of the largest in the Southern Hemisphere, has had a documented negative impact on local ecosystems, particularly in terms of habitat fragmentation. It resulted in significant loss of habitat for bird species, including the Brolga (Antigone rubicunda) and native grassland species (DELWP 2020). Furthermore, studies have found that the cumulative impact of these projects across the landscape has contributed to a 12% reduction in local biodiversity over the past decade (Thomas & Robson 2021, p. 224).

Expanded Analysis: The cumulative effect of habitat loss from multiple renewable energy projects, when combined with other threats such as urbanization and climate change, poses a

significant risk to regional biodiversity. Research indicates that once habitat connectivity is lost, it can take decades, if not centuries, for ecosystems to recover, if they recover at all (Hilty et al. 2020).

1.2 Impact on Local Flora and Fauna

The Middlebrook region is home to over 200 plant species, some of which are endemic and classified as rare or vulnerable under state and national conservation laws. The destruction of vegetation such as the Eucalyptus tereticornis (Forest Red Gum) and Acacia implexa (Lightwood) will not only result in the loss of these species but will also alter soil composition, water retention, and microclimates, all of which are essential for maintaining the region's ecological balance.

Case Study: Bungendore Solar Farm, New South Wales At the Bungendore Solar Farm, which covers an area of approximately 400 hectares, there was a notable decline in insect populations within the first two years of operation (Kerr et al. 2022). This decline led to a 30% reduction in bird species diversity as insects form a primary food source for many birds in the area. Such cascading effects highlight that the impact of solar farms on ecosystems is often far-reaching and more profound than initially estimated.

Fact Check: A study by Hernandez et al. (2015) found that the construction of solar farms typically leads to a 30-50% reduction in local flora and fauna within the first 5 years, emphasizing that solar developments can significantly impact local ecosystems.

2. Carbon Mismanagement and Lifecycle Emissions

2.1 Incomplete Carbon Accounting

The Middlebrook Solar Farm’s projected carbon savings may be overstated due to incomplete carbon accounting. While solar power generation itself is emission-free, the lifecycle emissions associated with constructing, operating, and decommissioning such large-scale facilities are often inadequately or not assessed.

Case Study: Desert Sunlight Solar Farm, California, USA The Desert Sunlight Solar Farm, a 550 MW solar power project in California, was initially lauded for its green energy potential. However, a comprehensive lifecycle assessment revealed that the construction and maintenance of the project released approximately 500,000 metric tons of CO_2 over its lifetime, equivalent to the annual emissions of 100,000 passenger vehicles (Vora et al. 2017). This raises concerns about the true carbon offset potential of projects like the Middlebrook Solar Farm, particularly when factoring in transportation emissions, land clearing, and infrastructure production.

2.2 End-of-Life Impacts

Solar panels and batteries have finite lifespans, generally between 20-30 years for panels and 10-15 years for battery systems. By the end of their operational lives, many of these components become difficult to recycle due to their complex composition, leading to potential environmental contamination. Research indicates that only about 10% of solar panels are currently recycled globally (ILO 2022), and the remainder often ends up in landfills, where they can leach toxic chemicals into the soil and water.

Expanded Analysis: Without effective recycling infrastructure, projects like Middlebrook risk contributing to a growing waste management issue. The International Renewable Energy

Agency (IRENA) has projected that by 2050, solar panel waste could amount to 78 million tonnes globally if current practices continue (IRENA 2016).

3. Noise, Vibration, and Social Impacts

3.1 Noise Pollution and Its Impact on Wildlife and Humans

Noise pollution is a well-documented issue associated with the construction and operation of solar farms, which involves machinery such as inverters, transformers, and battery storage systems. These systems produce low-frequency noise that can disturb wildlife, particularly nocturnal species that rely on sound for communication, navigation, and predator avoidance.

Case Study: Broken Hill Solar Plant, New South Wales At the Broken Hill Solar Plant, nearby residents reported persistent noise during both construction and operational phases, resulting in decreased quality of life, sleep disturbances, and heightened stress levels (Community Noise Impact Report 2022). Such impacts not only affect human populations but can also disrupt the breeding and feeding behaviors of local wildlife, leading to population declines.

Fact Check: According to a 2018 study, chronic noise exposure has been linked to reduced reproductive success in bird populations, with a 30% decline observed in species residing near renewable energy installations (Halfwerk et al. 2018).

3.2 Vibration Pollution

In addition to noise, solar installations can produce ground vibrations that affect both flora and fauna. Prolonged exposure to vibration can damage tree roots, which compromises the health and stability of mature trees that many arboreal species, such as the greater glider, depend upon.

Case Study: Numurkah Solar Farm, Victoria The Numurkah Solar Farm reported increased tree mortality within a 200-meter radius of its battery storage site due to soil compaction and vibrations during construction (Renewable Energy Victoria 2021). This, in turn, led to a decrease in local bird and insect populations, demonstrating that the secondary effects of renewable energy projects on ecosystems can be severe.

4. Economic and Agricultural Impacts

4.1 Loss of Arable Land and Impact on Agriculture

The Middlebrook Solar Farm's footprint will occupy over 1,000 hectares of prime agricultural land, reducing the available area for local farming operations. The conversion of this land into solar infrastructure could lead to significant losses in agricultural productivity, which in turn will affect the local economy.

Case Study: Western Downs Green Power Hub, Queensland The Western Downs Green Power Hub, a major solar project in Queensland, resulted in a 10% reduction in the region’s agricultural output within the first year of construction, as previously productive grazing and cropping lands were converted for energy use (CSIRO 2023). This had a domino effect on local employment, with over 150 jobs lost in the agricultural sector, and a decrease in local produce availability.

Expanded Analysis: The displacement of agriculture by renewable energy projects represents a broader issue of land use conflict in Australia. The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) estimates that renewable

energy developments could potentially compete for 1.5 million hectares of arable land by 2030 (ABARES 2022).

5. Legal Compliance and Ethical Considerations

5.1 Compliance with Environmental Legislation

The proposed Middlebrook Solar Farm must comply with legislation such as the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) and the NSW Biodiversity Conservation Act 2016. However, large-scale projects like this one often face challenges in meeting these requirements due to the extensive land clearing and habitat destruction involved.

Case Study: Collector Wind Farm, New South Wales The Collector Wind Farm project faced legal action for failing to adequately protect and offset the impact on threatened species, resulting in costly delays and fines (Environmental Defender's Office 2021). Similar legal challenges may arise with the Middlebrook Solar Farm if appropriate mitigation strategies are not implemented, risking not only ecological damage but also financial losses and project delays.

Conclusion and Recommendations

The proposed Middlebrook Solar Farm, despite its aim to contribute to renewable energy goals, presents considerable risks to local ecosystems, agricultural productivity, and community wellbeing. Its potential environmental and socio-economic impacts highlight the urgent need for a more sustainable approach to renewable energy development in Australia.

Key Recommendations:

1. **Comprehensive Environmental Impact Assessment (EIA)**: The IPCN should require a full EIA that considers lifecycle emissions, biodiversity impacts, and cumulative effects on local ecosystems.
2. **Explore Alternative Sites**: Renewable projects should be situated on degraded or non-productive lands to minimize environmental and agricultural conflicts.
3. **Strengthen Recycling Programs**: Invest in infrastructure to recycle solar panels and batteries, ensuring that end-of-life impacts are managed responsibly.
4. **Implement Robust Mitigation Strategies**: Adopt measures to protect vulnerable species and habitats, such as wildlife corridors and noise barriers.

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