

AEMC Virtual Power Plants Submission

12 September 2024

Author – Dr Anne Suse Smith, Rainforest Reserves Australia

Introduction

This submission addresses the environmental risks posed by the Australian Energy Market Commission's (AEMC) introduction of Virtual Power Plants (VPPs). While VPPs are promoted as integral to managing energy supply and reducing reliance on traditional generators (AEMC, 2024), their environmental consequences, particularly in terms of heat generation, noise, vibration, and their cumulative effects on wildlife, are critically underexplored. The push towards carbon neutrality must not blind us to the significant heating impacts these projects could generate—impacts potentially greater than those caused by fossil fuels. This submission examines the intricate and often devastating effects of VPP infrastructure on Australia's delicate ecosystems and its vulnerable species.

Impacts on Wildlife

Heating and the Carbon Neutrality Paradox

One of the most concerning environmental effects of VPPs is the localized heating they cause, often referred to as the "heat island" effect. Unlike the broad heating caused by global warming, this effect occurs as a result of altering wind patterns and concentrating heat in areas around energy infrastructure (Environmental Research Letters, 2023). Ironically, the implementation of these projects may result in localized temperatures higher than those the system seeks to mitigate through carbon neutrality.

Koalas (*Phascolarctos cinereus*), which are already highly susceptible to heat stress, are especially vulnerable to these temperature shifts. Koalas rely on the cooling effects of their forest habitats to regulate body temperature. The heating caused by VPP infrastructure can exacerbate dehydration, heat exhaustion, and increased mortality (Wildlife Queensland, 2023). Additionally, eucalyptus trees, the koalas' primary food source, are sensitive to temperature changes, potentially reducing the nutritional quality of leaves and further threatening koalas' survival (Australian Koala Foundation, 2023).

Noise Pollution

VPPs often require the development of large-scale battery storage and electrical infrastructure, which generates significant noise pollution. Studies have shown that continuous noise from industrial sites interferes with the communication patterns of many species. For example, koalas (*Phascolarctos cinereus*) use low-frequency bellows to communicate during mating seasons. The low-frequency noise generated by power plant facilities can mask these sounds, resulting in lower reproductive success (Smith & Johnson, 2023).

Other species such as the greater glider (*Petauroides volans*), which relies on silent night-time habitats for foraging, also suffer from noise disturbances. Increased noise pollution has been linked to changes in feeding behaviour and elevated stress levels, disrupting ecological balance (Commonwealth of Australia, 2020).

Vibration and Its Effects on Wildlife

Vibrations from VPP installations, particularly from construction activities, can affect species that rely on the ground for nesting and hunting. Ground-dwelling animals, such as the eastern quoll (*Dasyurus viverrinus*), are highly sensitive to vibrations, which can disrupt hunting patterns and nesting sites. Additionally, species like the greater bilby (*Macrotis lagotis*) may experience habitat fragmentation due to vibrations that disturb burrowing behaviours (International Rivers, 2023). Vibration not only displaces animals from their natural habitats but also hinders their ability to reproduce and maintain population stability.

The Impact on Marine Wildlife

VPPs, particularly when connected to offshore wind farms, threaten marine ecosystems. Species such as the southern right whale (*Eubalaena australis*) and bottlenose dolphin (*Tursiops truncatus*) rely on echolocation and communication in noise-free underwater environments. Noise pollution from underwater energy infrastructure can interfere with their ability to navigate, feed, and reproduce, resulting in increased stress and disorientation, which can lead to fatal beaching events (Marine Ecology Progress Series, 2023).

Heat Island Effect: A Silent Climate Crisis

The implementation of VPPs, designed to assist in carbon-neutral initiatives, paradoxically creates localized heating that may worsen the climate crisis. The phenomenon known as the "heat island" effect occurs when infrastructure disrupts wind flow and results in higher ground temperatures (Environmental Research Letters, 2023). The energy dissipated from battery storage, power lines, and transformers, when concentrated, heats up surrounding areas.

Such localized heating has direct consequences for ecosystems, especially for species unable to adapt quickly to temperature changes. For example, the already endangered greater glider (*Petauroides volans*) depends on specific temperature conditions in its forest habitat for survival. Increasing ground temperatures can disrupt this delicate balance, leading to habitat abandonment and population decline (Commonwealth of Australia, 2020).

The paradox of achieving carbon neutrality by sacrificing ecosystems is stark. Koalas, greater gliders, and other heat-sensitive species like the green sea turtle (*Chelonia mydas*), whose nesting and hatching are dependent on specific temperature ranges, face further threats as the localized warming effects exceed the global benefits of carbon neutrality (Wildlife Queensland, 2023).

Ethical and Legislative Failures

The environmental impact of VPPs on Australia's biodiversity raises ethical concerns that cannot be ignored. Projects that necessitate the destruction of natural habitats and the disruption of delicate ecosystems are in direct violation of the Environment Protection and Biodiversity Conservation (EPBC) Act (Department of Climate Change, Energy, the Environment and Water, 2023). These projects not only threaten endangered species but also reflect poorly on the ethical obligations of both corporations and the government to protect Australia's natural legacy.

Government officials, such as Environment Minister Tanya Plibersek, have made public commitments to safeguarding Australia's biodiversity. However, the approval of projects that exacerbate habitat destruction and biodiversity loss reveals a disturbing disconnect between public statements and policy actions. As Plibersek stated, "If we don't act now, future generations may only see koalas in zoos" (Plibersek, 2023). This dissonance underscores the

urgent need for legislative reform and public accountability to ensure that environmental policies align with Australia's long-term ecological interests.

Conclusion: A Call for Action

While VPPs are promoted as a solution to Australia's energy challenges, they come at a significant environmental cost. The destruction of habitats, the disruption of wildlife due to noise and vibration, and the paradoxical rise in local temperatures pose threats to Australia's biodiversity that must not be ignored.

The species affected by VPP projects—from the koala (*Phascolarctos cinereus*) and greater glider (*Petauroides volans*) to the green sea turtle (*Chelonia mydas*) and southern right whale (*Eubalaena australis*)—represent Australia's irreplaceable natural heritage. Their survival depends on our ability to balance progress with environmental protection. If we are to maintain the integrity of our ecosystems, urgent action is needed to ensure that VPP projects are subject to rigorous environmental impact assessments and that robust mitigation strategies are put in place.

We must be inspired by the resilience of the species around us and act decisively to protect them. In doing so, we not only preserve their habitats but also secure a sustainable future for generations to come.

References

- Australian Energy Market Commission 2024, *Virtual Power Plants Compete with Big Generators to Drive Down Prices*, viewed 12 September 2024, <https://www.aemc.gov.au/news-centre/media-releases/virtual-power-plants-compete-big-generators-drive-down-prices>.
- Australian Koala Foundation 2023, *Koala Habitat*, viewed 12 September 2024, <https://www.savethekoala.com/about-koalas/koala-habitat/>.
- Commonwealth of Australia 2020, *National Recovery Plan for the Greater Glider (Petauroides volans)*, viewed 12 September 2024, <https://www.environment.gov.au/biodiversity/threatened/publications/recovery/greater-glider-recovery-plan>.
- Department of Climate Change, Energy, the Environment and Water 2023, *Koala National Recovery Plan 2023*, viewed 12 September 2024,
- Environmental Research Letters 2023, *The Impact of Heat Island Formation on Local Ecosystems*, viewed 12 September 2024, <https://iopscience.iop.org/article/10.1088/1748-9326/ad28db>.
- Marine Ecology Progress Series 2023, *Effects of Offshore Wind Farms on Marine Life*, viewed 12 September 2024.
- Plibersek, T. 2023, *If We Don't Act Now, Future Generations May Only See Koalas in Zoos*, The Guardian, viewed 12 September 2024,
- Smith, R. & Johnson, A. 2023, *Noise Pollution and its Impact on Wildlife*, Journal of Wildlife Management, viewed 12 September 2024,
- Wildlife Queensland 2023, *Taking the Green out of Green Energy*, viewed 12 September 2024, <https://www.wildlife.org.au/taking-the-green-out-of-green-energy/>.