Hume North Battery Energy Storage System Submission

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Introduction

The Hume North Battery Energy Storage System (BESS) is a proposed energy storage facility located in Albury, New South Wales. With a planned capacity of 74 megawatts (MW) and two hours of energy storage, this project aims to support the integration of renewable energy into the electrical grid and enhance energy reliability. While this development contributes to New South Wales' renewable energy objectives, it introduces several significant environmental, community, and safety challenges that warrant thorough examination.

This submission evaluates the environmental impact, fire and explosion risks, community health concerns, and lifecycle sustainability issues associated with the project. It also outlines recommendations to mitigate these risks and proposes alternatives to ensure the project's alignment with principles of environmental stewardship and community well-being.

Environmental Impact

Noise Pollution

The operation of large-scale BESS facilities generates continuous low-frequency noise, which can disrupt local wildlife and human populations. For fauna, this noise interferes with communication, mating, and foraging behaviors, leading to habitat degradation and displacement (Krause & Farina, 2016). For human residents, exposure to persistent low-frequency noise has been linked to stress, sleep disturbances, and other health issues, ultimately reducing quality of life (World Health Organization, 2018).

Water Contamination

Lithium-ion batteries contain hazardous chemicals such as lithium, cobalt, and nickel. Leaks or spills of these substances pose significant risks to local water sources, potentially contaminating surface and groundwater relied upon for agriculture and drinking purposes. Contaminants may adversely affect aquatic ecosystems and harm communities dependent on bore water (World Bank, 2020).

Land Disturbance and Biodiversity

Construction and operation of BESS facilities typically require land clearing, which destroys habitats and threatens biodiversity. The Hume North area includes ecosystems that could support endangered or vulnerable species. Habitat fragmentation and ecosystem degradation

from such projects undermine conservation efforts and reduce ecological resilience (Department of Agriculture, Water and the Environment, 2021).

Fire and Explosion Risks

Nature of Fire Hazards

Lithium-ion batteries are prone to thermal runaway, a chain reaction triggered by overheating in one battery cell, which can ignite fires that release toxic gases like hydrogen fluoride and carbon monoxide. These fires are difficult to extinguish and pose severe health risks (Queensland Fire and Emergency Services, 2022).

Environmental Impact of Fires

Toxic pollutants released during BESS fires contaminate air, soil, and water, endangering local ecosystems. Fire suppression efforts, particularly water-based methods, can exacerbate water contamination. Persistent pollutants can remain in the soil, harming flora and entering local food chains.

Historical Incidents

The 2021 Tesla Megapack fire in Victoria highlights the challenges of managing BESS fires, often requiring days to contain. Local fire services may lack the specialised equipment and training needed to address such incidents effectively, increasing risks to communities near the project.

Chemicals Used in Lithium-Ion Batteries

Key Components and Risks

Lithium-ion batteries include hazardous materials with severe environmental and health impacts:

- **Lithium**: Mining depletes water resources and causes land degradation.
- **Cobalt**: Often sourced from regions with poor environmental and labor practices.
- **Nickel**: Mining contributes to deforestation and soil erosion.
- **Electrolytes**: Highly flammable and reactive, posing risks during leaks or fires.

Chemical spills or leaks can contaminate soil and water, harming ecosystems and human health. Bioaccumulation of these chemicals in fauna can result in reproductive and population declines.

Community Impacts

Health and Well-being

The project's noise and safety concerns may adversely affect nearby residents. Persistent noise, particularly low-frequency vibrations, has been linked to stress and cognitive impairments. Additionally, the risk of fires or explosions increases community anxiety, highlighting the need for robust emergency preparedness (World Health Organization, 2018).

Indigenous Cultural Heritage

The Hume North site may overlap with land of cultural significance to Indigenous communities. Construction and operation could disrupt these areas, potentially violating the principles of free, prior, and informed consent outlined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP, 2007). Protecting Indigenous heritage is both a legal obligation and a moral imperative.

Lifecycle and Sustainability Concerns

End-of-Life Battery Disposal

Disposing of lithium-ion batteries presents significant environmental challenges. Without proper recycling infrastructure, the risk of environmental pollution from electronic waste escalates. Toxic leachates from discarded batteries can contaminate soil and water, exacerbating ecological harm (World Bank, 2020).

Supply Chain Issues

The extraction of materials like cobalt, lithium, and nickel often involves environmental destruction and human rights violations. Mining activities in developing countries contribute to habitat loss and unsafe labor practices, raising ethical concerns about the sustainability of energy storage systems (Amnesty International, 2019).

Recommendations

1. **Enhanced Fire and Safety Systems**
    - Install advanced fire suppression technologies and thermal management systems.aProvide specialised training for local emergency services.
2. **Environmental Monitoring and Mitigation**
    - Conduct regular soil and water quality tests to detect contamination.
    - Implement biodiversity offsets and preserve critical habitats during construction.
3. **Community and Indigenous Engagement**
    - Collaborate with Indigenous communities to safeguard cultural heritage.
    - Develop clear communication strategies for local residents regarding health and safety measures.

4. **Lifecycle Management**
    - Establish robust recycling protocols for end-of-life batteries.
    - Promote responsible sourcing of raw materials to minimise supply chain impacts.

Conclusion

The Hume North Battery Energy Storage System has the potential to advance renewable energy integration in New South Wales. However, the project's considerable environmental, safety, and community risks outweigh its benefits in its current form. Key issues include fire and explosion hazards, contamination of natural resources, and adverse effects on local biodiversity and Indigenous heritage.

To address these challenges, the project should adopt more robust safety and environmental safeguards, prioritise community engagement, and ensure compliance with ethical sourcing and recycling practices. Such measures are essential to align the project with principles of sustainability and social responsibility.

Until these critical concerns are resolved, the Hume North BESS project should not proceed. Redirecting efforts toward alternative technologies, locations, or designs can ensure energy storage benefits without compromising environmental integrity or community well-being.

References

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