Ensuring Appropriate Rehabilitation and Recycling at the Decommissioning Phase of a BESS project

To ensure the appropriate rehabilitation and recycling of Battery Energy Storage Systems (BESS) at the end of their operational life, the following measures could be implemented.

Decommissioning Plan

We recommend that a detailed decommissioning plan be submitted to the Council for review and approval 12 months prior to the decommissioning date (in 20 years' time). At that time, more specific options will be available to ensure appropriate decommissioning, land rehabilitation, and maximum recycling of the project components.

The decommissioning plan could include the following items:

- **Adherence to Regulations** – show how the decommissioning will adhere to NSW and Australian regulations and standards for the recycling and disposal of BESS to ensure environmentally responsible practices.
- **Advanced Recycling Techniques** – utilize state of the art recycling technologies capable of efficiently and safely extracting valuable material from used batteries.
    - Australia has several initiatives and facilities dedicated to recycling lithium iron phosphate (LFP) batteries. Key players include:
        - **Envirostream Australia:** A subsidiary of Lithium Australia, Envirostream operates a battery recycling plant in Victoria. They focus on shredding and recycling various lithium-ion batteries, including LFP. The process recovers valuable materials such as steel, copper, aluminum, and mixed metal dust, which can be repurposed into new batteries (Emerging Technology News) (The West Australian).
        - **Renewable Metals:** This startup, based in Western Australia, is scaling up its operations with plans for a pilot plant in Perth. They have developed technology to recycle a wide range of lithium-ion batteries, including LFP. Renewable Metals aims to recover over 95% of valuable materials from the batteries and is

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supported by significant investment to enhance their recycling capabilities (pv magazine Australia).

- These efforts are part of a broader move to develop a robust battery recycling industry in Australia, addressing the growing demand for effective waste management as the use of lithium-ion batteries in various applications increases.

- **Baseline Environmental Assessment** - Conduct a detailed assessment of the site's current environmental conditions to identify any contamination or alterations caused by the battery storage project.
  - **Soil and water remediation**
    - **Contamination Testing:** Test soil and groundwater for any contamination from the battery storage operations. Common contaminants could include heavy metals and chemical residues from batteries.
    - **Remediation Efforts:** If contamination is found, undertake soil and water remediation efforts. This could involve techniques like soil washing, bioremediation, or chemical treatment to remove pollutants.
  - **Restoration of Vegetation and Wildlife Habitats**
    - **Revegetation:** Restore native vegetation by planting local plant species that were present before the installation of the battery storage project. This helps in stabilizing the soil and providing habitat for local wildlife.
    - **Habitat Restoration:** Implement measures to restore habitats for wildlife, which may include creating water features, planting specific vegetation, or installing structures that support local fauna.
  - **Long-Term Monitoring and Maintenance**
    - **Environmental Monitoring:** Establish a long-term monitoring program to track the recovery of the site. This includes regular soil, water, and vegetation assessments to ensure that the site is returning to its natural state.
    - **Maintenance:** Conduct regular maintenance activities to manage invasive species, repair any erosion control structures, and ensure the success of revegetation efforts