

Battery energy storage systems – noise solutions



Trinity Consultants Australia offers a wide range of noise services, including comprehensive acoustic solutions for battery energy storage systems (BESS).

We have extensive experience supporting clients with proposed or existing sites to develop solutions for their unique projects. We cover all stages of the project lifecycle, from concept to detailed design and commissioning. We also address problems with existing BESS units.

In this growing area of the market, demonstrated expertise is invaluable. Our local and global knowledge and insights, acquired through working on multiple large-scale BESS projects, help our clients to implement practical, effective and compliant solutions.

Our capabilities

Pre-development approval

- Visit proposed sites to conduct in-situ noise measurements and build acoustics test data
- Determine noise criteria and sensitive receptors
- Conduct noise impact assessment

Post-development approval

- Conduct detailed assessment to optimise noise performance
- Collate data, including operational data

Software modelling

- Build 3D computer model of site and surrounding area. Input data includes meteorological conditions, noise source, sound power levels, terrain contours, site layout and storage system (cluster or array)

Construction stage

- Conduct remote, online noise monitoring that tracks and analyses noise levels in real-time

Ongoing operations

- Conduct periodic noise monitoring as part of site maintenance or compliance with planning conditions
- Assist with noise complaints to identify, analyse and address sources





Software and modelling

We use specialist software to simulate noise sources in 3D and predict noise propagation based on ISO 9613 or Concaawe. This provides a more accurate and detailed picture of your site. Our programs (including CadnaA and SoundPLAN) assess, identify and rank operational noise sources including inverters/transformers, converters, back-up generators, substations and heating, and ventilation and air-conditioning (HVAC) systems for BESS units (rack or container type). If required, we have the capability to model meteorological conditions to confirm if noise-enhancing conditions are deemed significant.

Using the noise prediction model, we can also simulate operational noise control options, as well as short-term construction noise impact. Our model is able to incorporate dynamic onsite activities (including grading operations) and offsite activities (including construction of underground transmission line).

Collaborative approach

Our Trinity noise engineers collaborate with developers and diverse project stakeholders to deliver customised solutions for each unique environment. Engaging our team early in the project enables us to investigate an acoustically optimal layout of your BESS units. It also allows us to recommend mitigation strategies to optimise the operations of the BESS units and reduce the likelihood of noise complaints.

Certifications and standards

- JAS/ANZ 3rd Party Certified by SCI Qual International (certification number 4277) for our Quality Management System, which is in conformance with ISO 9001:2015
- Staff who are a Registered Professional Engineer Queensland (RPEQ)



Our solutions

Trinity has delivered BESS noise solutions for large-scale solar farm developments in Australia and the US, with typically 200 or more containers and capacity ranging from 250 to 1600MW.

Our mitigation strategies include a variety of the below, customised to each individual project's requirements:

- Noise barriers
- Reorientation of BESS units to leverage directivity
- Acoustic enclosures and louvres
- Adjusting cooling fan speed of chillers of BESS
- Collaborating with manufacturers to alter fan design or incorporate factory-designed acoustic louvres
- Rescheduling charge and discharge periods to minimise noise during peak hours
- Relocation of BESS units.



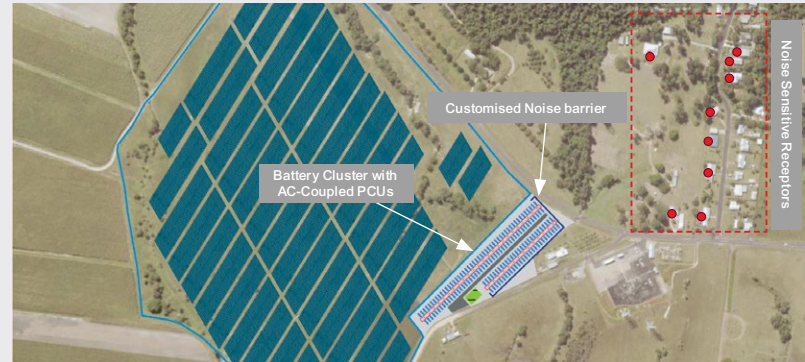
See our work

In 2 recent examples below, it is apparent how our mitigation strategies assisted in effectively managing BESS noise impacts.

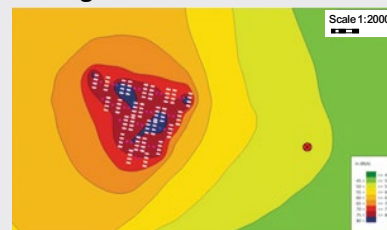


Project 1 BESS containers, clustered

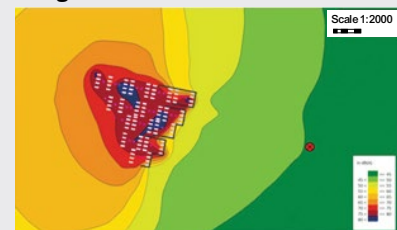
Mitigation approach – cluster 100+ units



Unmitigated



Mitigated with noise barriers

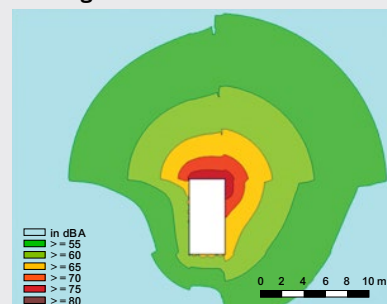


Project 2 BESS containers, distributed

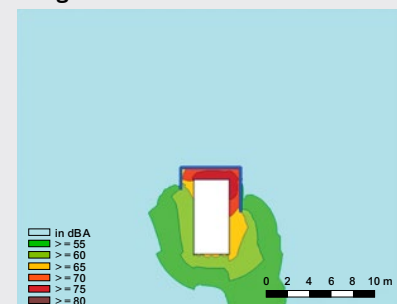
Mitigation approach – single unit



Unmitigated



Mitigated with noise barriers



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