



### Project Background

Compact BESS acts as an energy amplifier in tower crane operations. Typically, large diesel generators run continuously, even when cranes are idle, leading to unnecessary diesel consumption, higher costs, and emissions—issues particularly relevant in Hong Kong due to fluctuating diesel prices.

In this project, we deployed our BESS to support three tower cranes, significantly reducing the reliance on continuous diesel generator operation. **This resulted in a cleaner, quieter, and more cost-effective power strategy for construction site operations.**



### The Challenge

Tower crane applications present a demanding power profile, especially during startup. Cranes require high inrush current, which can be several times higher than their normal operating load. In most construction projects, one BESS is typically assigned to one tower crane. Supporting three tower cranes with a single BESS is highly unusual and presents a significant technical challenge.

Key challenges included:

- High startup current demand
- Long cable distance - The BESS and tower cranes were located approximately 100 metres apart, increasing the risk of transmission losses and affecting performance.
- Wasteful diesel generator operation

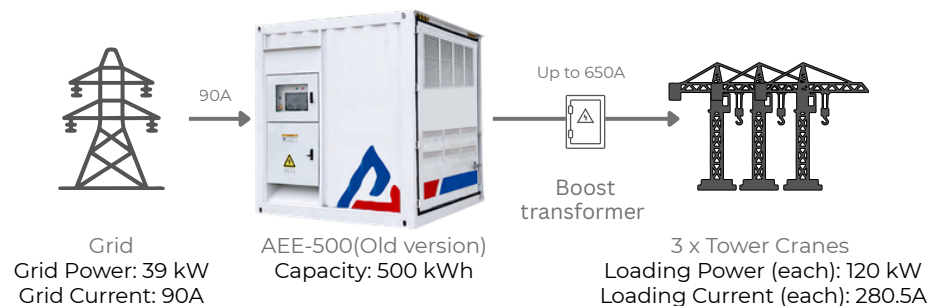
### AEE Solution

We deployed our BESS as a temporary power solution for tower cranes, **supplying power during idle and low-load periods while meeting demand when needed.** A transformer was installed to boost the AC voltage over the 100-metre distance to the cranes, minimising transmission losses.

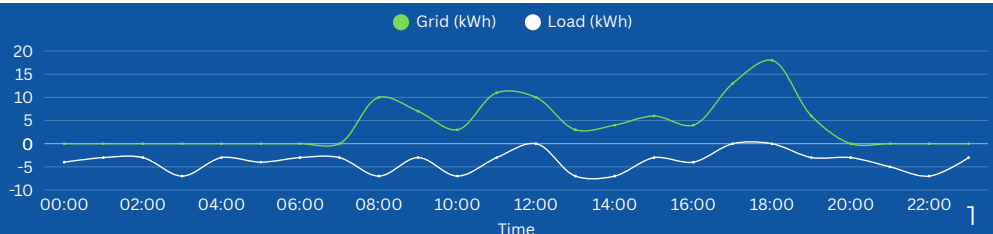
This setup showcased the effectiveness of our BESS in a challenging environment.



- Power support for three tower cranes from a single system
- Stable performance despite high startup current demand
- Reduced diesel generator runtime during idle and standby periods
- Efficient power delivery across long-distance cable connections

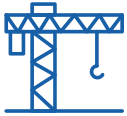


- AEE Model: AEE-500 (old version)
- Capacity: 500 kWh
- Grid Input: 90A (39kW)
- Operating duration: 12 hours a day



## Results and Performance

Using a Battery Energy Storage System instead of a diesel generator **reduces reliance on diesel and provides a cleaner, more reliable on-site power source.** This **reduces vulnerability to fuel supply issues, price fluctuations, and generator downtime.**



### Support for High-Demand Equipment

Designed for challenging site conditions, our BESS provides the power needed to support heavy equipment like tower cranes with high startup current demands.



### Lower operating costs

By replacing diesel with stored energy, our Battery Energy Storage System (BESS) enables contractors to lower their fuel costs.



### Smarter energy use during idle

Our BESS captures and stores energy during off-peak periods and supplies power to the tower cranes when needed, reducing unnecessary generator runtime and maximizing energy efficiency on site.



### Cleaner operations

Replacing diesel with grid support reduces emissions and promotes more sustainable and cost-effective operations.



### Built to handle high inrush demand

Designed for demanding construction applications, the system supports the high startup current of tower cranes, including simultaneous crane starts, ensuring reliable performance when it is most needed.

Category	Traditional Diesel	AEE Compact BESS Solution	Result
<b>General Capacity Required</b>	3 x 150 kVa	Grid support	No Genset required
<b>Runtime (hrs /day)</b>	12 hrs (Genset Operation)	12 hrs (BESS operation)	/
<b>Fuel Consumption (L/day)</b>	1,080 L/day	0	↓100%
<b>Operation Cost (\$/day)</b>	Diesel: AUD 2,146 /day*	Electricity: AUD 827 /day*	↓52%
<b>CO2 Emission (kg/day)</b>	2,900 kg/day	0 kg/day	↓2,900 kg
<b>Maintenance Cost (monthly)</b>	High (continuous running)	Low	↓80%
<b>Payback Period</b>	/	12 months	

\*Based on diesel price and electricity price in Hong Kong, with 1 AUD = 5.53 HKD

If we apply the case study to Australia, the operational cost saved per day will be AUD 1,426, payback period will be 10 months. (Operational cost saved per day: traditional diesel per day AUD 2,376 - electricity price per day AUD 950)

## Project Significance

This project showcased the power and flexibility of our BESS by supporting three tower cranes without relying on three continuously running 150 kVA diesel generators. It proved our system's ability to handle demanding construction applications while reducing fuel use, lowering costs, and enabling cleaner site operations.

## Get in Touch



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