Battery Energy Storage System (BESS)

Working towards a sustainable future

BYRNE EQUIPMENT RENTAL

Equipment Overview

BESS is essentially a large, rechargeable battery
– like a giant version of the one in your smart phone or laptop
– that can store electricity and release it when needed

BESS offers numerous benefits:

Cost & Operational Advantages

Lower Operating Costs
Reduces diesel use, generating significant long-term savings

Reduced Fuel Logistics
Removes or reduces fuel transport and storage, simplifying site operations

Low Maintenance Needs
Few moving parts reduce servicing time and costs

Green Brand Leadership

Environmentally Friendly
Operates quietly with zero harmful emissions, improving air quality

Improved Brand Image
Shows sustainability commitment

Sustainable operations
- Works with renewable sources
- Meets stricter emissions and noise rules without costly delays

Technical Performance & Efficiency

Efficient Energy Use (Peak Shaving & Load Balancing)
Stores energy during low demand, discharges during peaks, reducing need for oversized generators

Instantaneous Response
Provides power in milliseconds for uninterrupted supply, unlike diesel generators with startup delays

Precision Power Delivery
Stabilises output for sensitive equipment, avoiding voltage fluctuations or harmonics

Higher Reliability, Less Downtime
Reliable power reduces outages, minimising costly event disruptions

WE PROVIDE BOTH BATTERY SOLUTIONS WITH DIESEL GENERATOR OR WITHOUT GENERATOR, OR WITH SOLAR PANELS TO MEET YOUR NEEDS.

BYRNE SOLAR POWERED

Enabling operational efficiency through equipment rental and lease solutions

UAE ▮ KSA ▮ Oman ▮ Bahrain

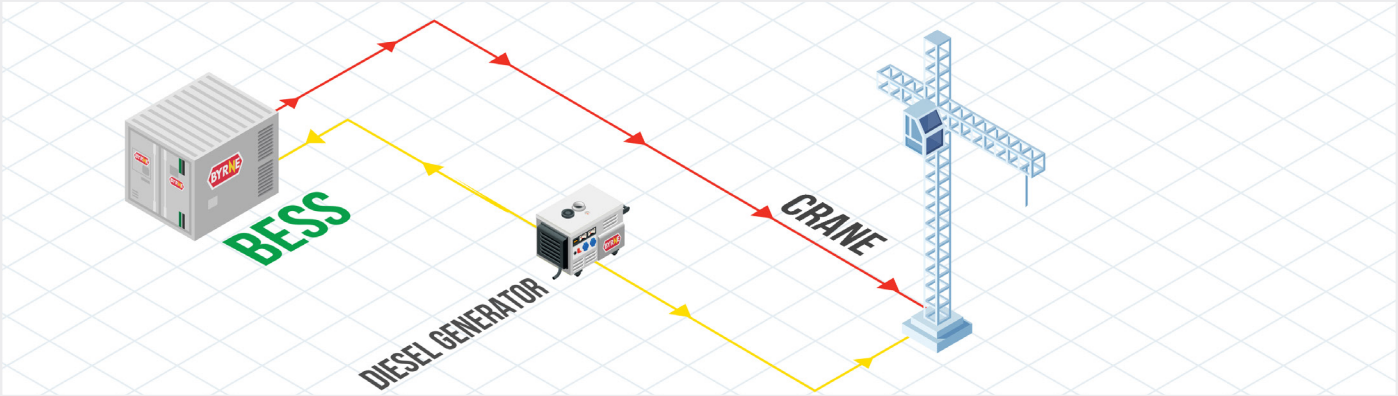
Flexible Power Options

Serial Charging Mode

- Generator connects to BESS only
- BESS requires full load capacity to handle maximum load peaks independently, delivering clean and stable power to equipment
- Generator starts only when BESS needs charging, reducing generator size and daily running hours

Parallel Charging Mode

- Generator connects directly to both equipment and BESS
- Generator powers the equipment directly and can charge BESS at the same time, efficient for steady/ continuous loads
- Since BESS smooths fluctuations, supports peak loads, and provides reserve, it thus does not require full load capacity but also allows for a smaller-sized generator



Applications

Fluctuating Load Charge & Voltage Dips

- Smooths demand spikes
- Allows use of a smaller generator
- Saves fuel
- Cuts emissions & maintenance costs

E.g. Crane

Critical Power Backup

- Provides reliable sources
- Stabilises voltage

E.g. Data Centre/ O&G Oil Pump

Events

- Quiet, low-noise operation
- Lowers chance of breakdown
- Supplies reliable power
- Reduces emissions and maintenance costs

Enabling operational efficiency through equipment rental and lease solutions

UAE ▮ KSA ▮ Oman ▮ Bahrain

CASE STUDY

TOWER CRANE OPERATIONS

Client Overview: A leading construction company needed a sustainable and efficient power solution to support 2 tower cranes at a major construction site.

Solution Provided: Byrne delivered

- **BESS Installation:** Installed 2 BESS units with a power output of 215 kW each and an energy storage capacity of 215 kWH each.
- **Generator installation:** Installed 1 x 200 kVA generator to charge both BESS units.

Operational Support: Our team handled the installation of BESS, resized and configured the units to meet peak crane loads and ensure seamless, uninterrupted operation. We continue to monitor and ensure continuous operations for both tower cranes directly from the battery systems.

Result: This project shows how advanced battery storage can power large-scale construction with clean, low-emission, and cost-effective energy, supporting the client's sustainability goals. Over 24 months, it has cut diesel use by 50–60% and costs by 30%, setting a benchmark for future sustainable projects.

Monthly Savings – Battery Box vs. Traditional Generator

Setup	Rental Cost	Fuel Cost	Total Monthly Cost	Fuel Used (Liters)
Traditional – 2×350 kVA Generators	AED 14,000	AED 102,960	AED 116,960	37,440 L
Battery Box – 2×215 kW Battery + 200 kVA Generator	AED 37,000	AED 45,045	AED 82,045	16,380 L
Difference	**AED 23,000**	**(AED 57,915)**	**(AED 34,915)**	**(21,060 L)**

Savings with Battery Box

Per Month:

- **AED 34,915 saved**
- **30% lower cost**
- **21,060 liters less fuel (56% fuel saving)**

Over 24 Months:

- **AED 838,000 saved**
- **505,000 liters less fuel (≈ AED 1.39M fuel value saved)**

Cost and fuel savings are approximate, based on current rental rates, fuel prices, and operating conditions. Actual savings may vary depending on usage patterns, fuel price fluctuations, and site-specific requirements.

WHAT BYRNE OFFERS

BYRNE EQUIPMENT RENTAL

We can create a more **sustainable future** based on your **specific application**.

1 **Consultation**
Assess your project energy needs

2 **Custom Design**
Tailored BESS solution

3 **Implementation**
Seamless setup and support

4 **Sustainable Future**
Powering your success

Specifications

General Specifications	
Configuration	215 kW / 215 kWH
Dimensions (L x W x H)	2800 x 1800 x 2400 MM
Weight	3.5 TON
Container Type	Outdoor Cabinet
Operating Ambient Temperature	-20 °C to +60 °C (>50°C Derating)
Humidity	0% to 95% (No Condensation)
Maximum Operating Altitude	2000 M
Acoustic Level at 1M	< 80 db
System Round Trip Efficiency	>85 %
Fire Suppression System	Aerosol
Output Isolation	Isolation Transformer
IoT	Ethernet, RS 485
Built-in Diesel Generator (DG) Management Feature (2)	Yes

AC Power Specifications	
Rated Power	215 kW
Peak Power (@60 SEC)	250 kW
Peak Power (@10 SEC)	300 kW
Rated Output Current	310 A
Peak Output Current (@60 SEC)	360 A
Peak Output Current (@10 SEC)	433 A
Rated Input/ Output Voltage	400 Vac @ 3 Phaes 3L/N/PE
Input/ Output Voltage Range	340 - 460 Vac
Input/ Output Frequency	50/60 HZ ± 2.5 HZ
Power Factor	0.99 Leading - 0.99 Lagging
THDi (Total Harmonic Distortion - Current)	≤ 3%
Thermal Management (AC Cabin)	Air Forced Cooling
Battery Specifications	
Battery Cell Type	CATL AMPACE LFP 280 Ah, 1C / 1P
Rated Energy Storage Capacity	215 kWH
Operating DC Voltage	672 ~ 876 Vdc
Depth of discharge (DoD) (3)	90% / 80%

Product specifications may vary and are subject to change without prior notice.

Enabling operational efficiency through equipment rental and lease solutions

UAE ▮ KSA ▮ Oman ▮ Bahrain