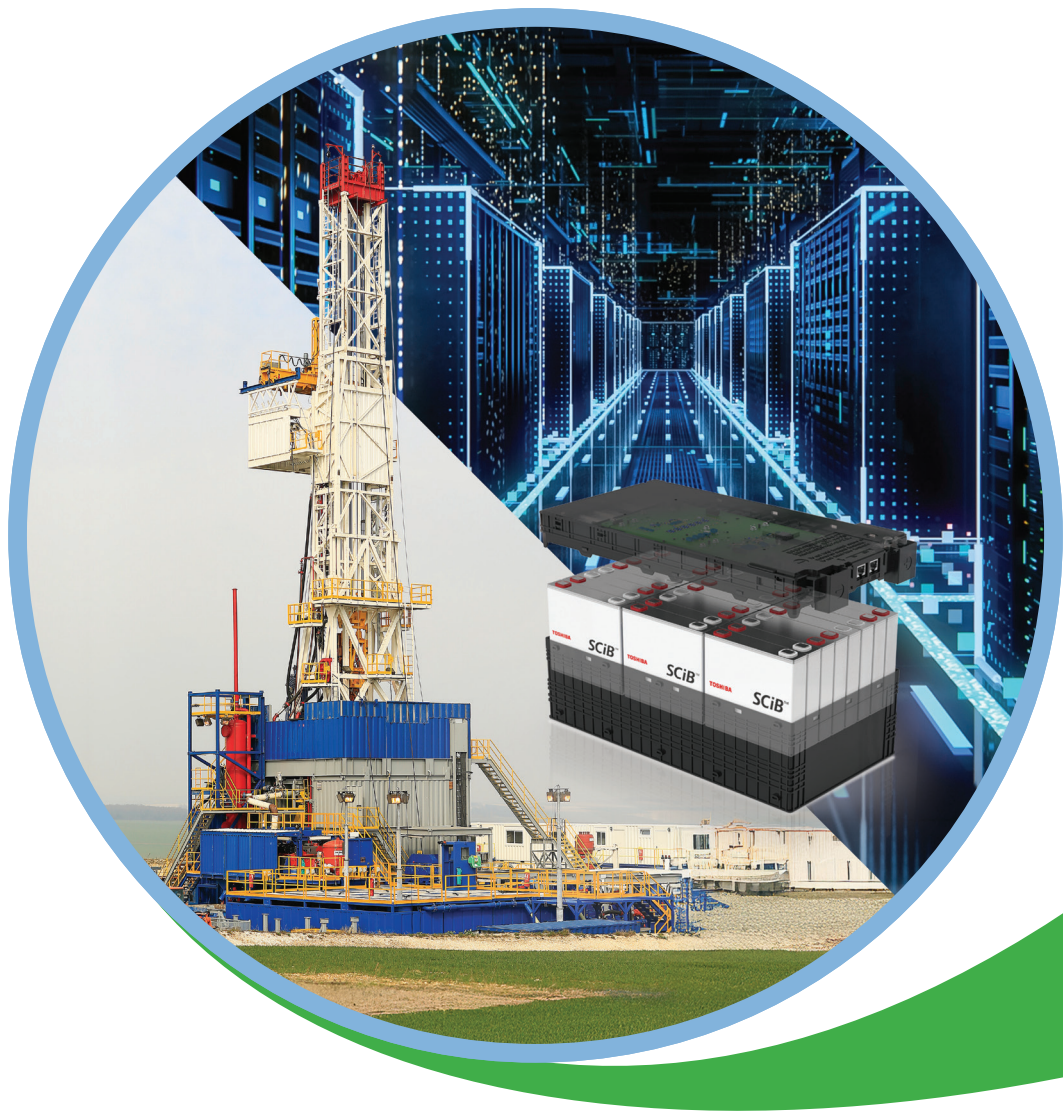


**BESS • BATTERY ENERGY STORAGE SYSTEM**  
**FROM DRILLING RIG TO AI DATA CENTER**



# Lithium Battery Technologies

Not all lithium batteries are created equal and in general there are six primary chemistries, each engineered for different performance priorities:

- **NMC** – Lithium Nickel Manganese Cobalt
- **LFP** – Lithium Iron Phosphate
- **NCA** – Lithium Nickel Cobalt Aluminum Oxide
- **LTO** – Lithium Titanate Oxide [**Jelec's selection**]

These battery technologies fall into two key performance categories:

**High-Energy Batteries:** Designed to store large amounts of energy and deliver it over extended periods, making these type of battery ideal for applications like renewable energy (solar, wind) and long-duration backup.

**High-Power Batteries:** Engineered to deliver rapid bursts of power with exceptional responsiveness. This is where LTO technology stands apart, delivering high output instantly, with unmatched reliability under demanding conditions.

## Battery Basics – Understanding the Fundamentals

Whether you're new to battery systems or have experience working with them, a few core concepts help explain how batteries perform and how to evaluate the right solution for your application.

**C-Rate:** One of the most important characteristics of a battery is how quickly it can deliver energy and is commonly referred to as C-rate, which measures how fast a battery can charge or discharge relative to its total capacity. For example, a 1C rate means the battery can fully discharge in one hour, while higher C-rates indicate faster energy delivery. In practical terms, higher rates mean the battery can respond more quickly and deliver more power when it is needed most.

**State of Charge (SOC):** represents how much energy is currently stored in the battery. Expressed as a percentage, SOC functions much like a fuel gauge—100% means the battery is fully charged, while lower values indicate the remaining available energy. This is one of the most used indicators for monitoring battery status during operation.

**Depth of Discharge (DOD):** measures how much of the battery's capacity has been used. For example, if a battery has been discharged by 80%, it is said to have an 80% DOD. A deep discharge typically refers to using a large portion of the battery's stored energy. SOC and DOD are essentially inverse measures, one tells you what remains, while the other tells you what has been used.

**Cycle life:** describes how long a battery will last over time. It refers to the number of charge and discharge cycles a battery can complete before its performance begins to degrade. Cycle life is influenced by how the battery is used, including how deeply it is discharged, how quickly it is charged and discharged, and the environmental conditions in which it operates. In general, deeper discharges and more demanding operating conditions will reduce overall lifespan.

## Toshiba SCiB™ LTO Technology vs other Li-Ion Technologies

Most systems use LFP, NMC, or NCA optimized for \$/kWh. Jelec uses Toshiba SCiB LTO technology for power performance, safety, and durability.

Traditional batteries store energy and typically operate a low C-rates (0.25C – 1.0C) whereas Jelec LTO systems deliver power performance and operate at much higher C-rates (2.5C – 8C). Operating at higher C-rates enables the Jelec BESS to output a large amount of power from a much smaller total capacity, making them ideal for AI data centers, oil & gas rigs, and microgrid applications.

Feature	Conventional Lithium (LFP/NMC/NCA)	LTO (Jelec Standard)
Cycle Life	Up to 7,000 Cycles	Up to 145,000+ Cycles
Impedance	Moderate	Low
C Rating	Low	High
Power Output	Moderate	Very High
Charging Speed	Moderate	Ultra-Fast
Safety	Thermal Runaway Risk	No Self Thermal Runaway
Application	Long-Duration Energy Storage	Dynamic Power & Grid Stabilization

# From Drilling Rigs to Data Centers

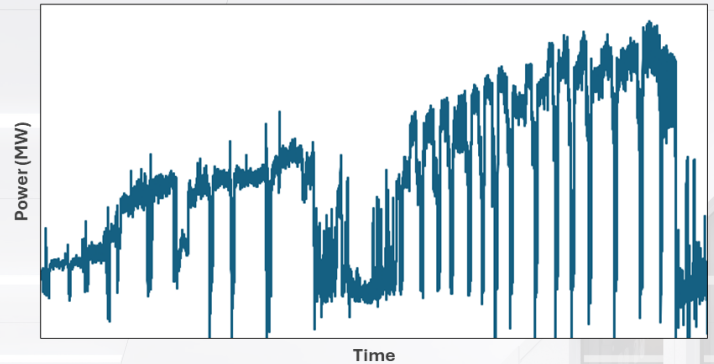
Jelec has a long history of engineering and delivering advanced power solutions for the oil and gas industry, from power houses and drilling rigs to the electrification of frac fleets. Building on this foundation, we deployed our battery energy storage systems on drilling rigs, reducing fuel consumption, lowering emissions, and improving overall operational efficiency.

In these environments, we support drilling operations where megawatt-scale loads can change dramatically in seconds. These rapid swings, along with high-frequency load variability and power jitter, historically led to fuel inefficiency, generator stress, and operational risk. By integrating battery energy storage as a dynamic power buffer, we stabilized these fluctuations, reduced mechanical strain on generation assets, and created predictable, controllable power environments.

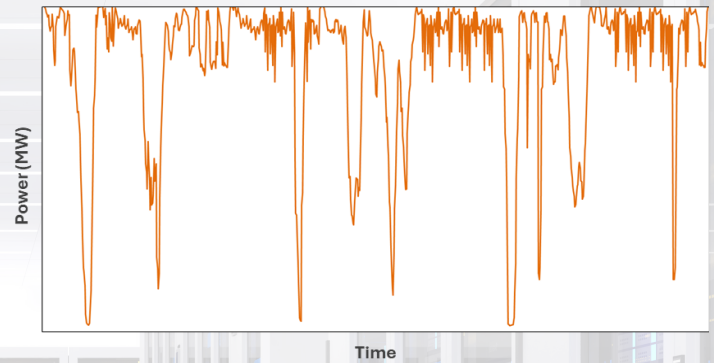
All data centers are now facing the same aggressive load ramp dynamics and power jitter historically seen in high-horsepower drilling microgrids. GPU clusters can introduce megawatt-scale demand swings, with 50–60% step-load events occurring within milliseconds, creating interconnection challenges and stressing on-site power generation. Conventional UPS systems were never designed to function as continuous dynamic load buffers. Jelec’s fast-response battery energy storage architecture, proven in industrial microgrids, provides a scalable solution for stabilizing next-generation AI infrastructure.

Jelec’s BESS is engineered to maximize the performance of Toshiba SCiB™ lithium-titanate (LTO) batteries, enabling high C-rate operation, rapid recharge, and durability under aggressive cycling. Through integrated battery and power management systems, the platform optimizes energy flow in real time between the grid, on-site generation, and critical loads, mitigating jitter, smoothing rapid fluctuations, stabilizing frequency, and reducing stress on infrastructure. The result is a resilient, high-performance solution that improves interconnection viability, enhances reliability, and supports scalable AI data center deployment.

Drilling Rig Power Load Profile



AI Data Center Power Load Profile



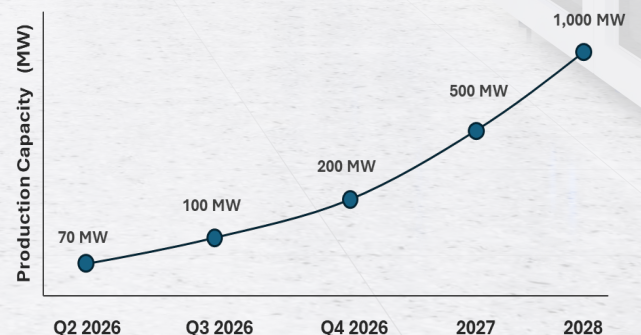
## 250MW AI Data Center BESS Comparison

Feature	Conventional Lithium (LFP/NMC/NCA)	LTO (Jelec Standard)
Footprint	Seventeen 40ft buildings	Seven 20ft buildings
Longevity	4 to 5 years	Up to 20 years
Safety	Thermal Runaway Risk	No Self Thermal Runaway
Power Output	Moderate	Very High
Charging Speed	Moderate	Ultra-Fast
Price		20% less than competition

Jelec’s manufacturing strategy supports scalable expansion from 70 MW of annual BESS production to 1,000 MW.

To support this growth, Jelec is developing a new 110,000-square-foot production facility adjacent to its existing fabrication facility, bringing the total campus footprint to over 180,000 square feet. Scheduled to come online in Q4 2026, this expansion will significantly increase manufacturing throughput and system integration capacity to support gigawatt-scale output.

This phased, infrastructure-backed growth model ensures production scalability without compromising quality, performance validation, or delivery reliability.



# Jelec 20 ft BESS

Our 20 ft Battery Energy Storage System delivers exceptional power in a compact footprint, offering flexibility for a wide range of applications. Our mobile version can be mounted on a drag skid or trailer for rapid deployment and is ideal for projects that require frequent relocation, such as oilfield operations, temporary power sites, or mobile microgrids. Our stationary high-capacity version is designed for permanent installations, maximizing storage density and operational stability for AI data centers and other critical facilities. Each system incorporates automated climate control to maintain optimal internal conditions and prevent condensation, ensuring long-term reliability, while its modular design allows storage capacity to be easily scaled to meet project-specific requirements.

Whether mobility or maximum capacity is the priority, Jelec's 20 ft BESS combines high output, reliability, and adaptability in a streamlined, scalable package.

## 20 ft High-Capacity Stationary BESS (Data Center Applications)

The stationary 20 ft system maximizes capacity in a compact footprint, with integrated inverters, enhanced cooling, and external power distribution. Modular units can be combined to scale output from MW to GW.

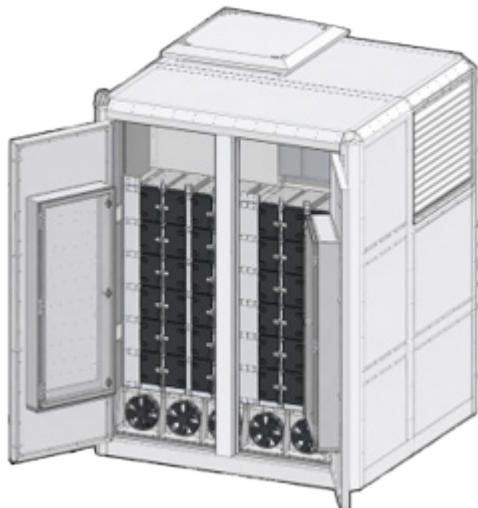


<b>Capacity</b>	439 kWh (scalable)	<b>Output Voltage</b>	480 Vac / 3Ph +G
<b>Continuous Power</b>	1,140 kW	<b>Frequency</b>	50 / 60 Hz
<b>Peak Power</b>	3,000 kW	<b>Inverter</b>	3MW Peak / 2MW continuous
<b>Configuration</b>	1P34S	<b>Cycles</b>	Up to 145,000 cycles
<b>Unit Dimensions</b>	20 ft (L) x 8 ft (W) x 9.5 ft (H)	<b>Weight</b>	46,000 lbs (21,000 kgs)

## 20 ft Mobile BESS (Drilling Rigs)

A solution configurable up to eight battery cabinets within a 20ft ISO container and incorporates inverters, transformers, and cooling to deliver a seamless installation. With a power capacity of up to 1.3 MW, the 20ft connex design provides a compact, transportable solution that combines high output, reliability, and simplified deployment for your application.

<b>Capacity</b>	337 kWh (scalable)	<b>Output Voltage</b>	600 Vac / 3Ph +G
<b>Continuous Power</b>	740 kW	<b>Frequency</b>	50 / 60 Hz
<b>Peak Power</b>	1,300 kW	<b>Inverter</b>	4 x 332kW Peak / 275kw continuous
<b>Configuration</b>	1P34S	<b>Cycles</b>	Up to 145,000 cycles
<b>Unit Dimensions</b>	20 ft (L) x 8 ft (W) x 9.5 ft (H)	<b>Weight</b>	46,000 lbs (21,000 kgs)



## Jelec – Outdoor Cube 250kW BESS

The Jelec Cube integrates two battery cabinets, an inverter, and a dedicated cooling system into a compact footprint. This all-in-one configuration delivers high power density, simplified installation, and efficient thermal management—providing a turnkey solution for demanding applications where space and performance are critical.

<b>Capacity</b>	84 kWh (scalable)	<b>Output Voltage</b>	480 Vac / 3Ph +G
<b>Continuous Power</b>	325 kW	<b>Frequency</b>	50 / 60 Hz
<b>Peak Power</b>	500 kW	<b>Inverter</b>	332kW Peak / 275kw continuous
<b>Unit Dimensions</b>	6 ft (L) x 6 ft (W) x 8 ft (H)	<b>Cycles</b>	Up to 145,000 cycles
<b>Weight</b>	12,000 lbs (5,500 kgs)		

# Jelec High Power BESS Technology

The Jelec BESS incorporates high power Lithium Titanate Oxide (LTO) battery modules into our proprietary design that is scalable, enabling multiple module configurations to meet diverse end-use requirements. Our LTO BESS solution provides a long lifespan, rapid charging, high input/output performance, excellent low-temperature performance, and wide SOC range, all while maintaining a high level of safety.



## High Power

Our LTO batteries can be charged and discharged at multiple times the capacity enabling high power output in a very small footprint.



## Fast charge and discharge

Our BESS platform supports rapid full state-of-charge (SoC) recovery without significant degradation from frequent high-rate charging cycles.



## Best-in-Class Safety

Our LTO batteries demonstrate exceptional tolerance to electrical and thermal stress conditions, without the hazardous failure modes associated with other lithium-ion chemistries.



## Extremely long cycle life

Minimal capacity degradation is observed even under repetitive high-power load profiles. The system can be engineered for lifecycle (up to 145,000 cycles) or for service lifespan (up to 30-years).

## Applications Optimized for High-Power, Fast-Response

**AI Data Center Load Stabilization** — High-speed GPU load buffering

**Microgrid Stability & Control** — Real-time load balancing

**Hybrid Power Systems** — Fuel cells and generator optimization

**Transient Load Support** — Mitigates rapid power fluctuations

**Black Start Capability** — Grid-independent system energization

**Renewable Integration** — Smoothing and energy shifting

**Energy Arbitrage & Peak Shaving** — High-cycle cost optimization



## Jelec – Battery Cabinet

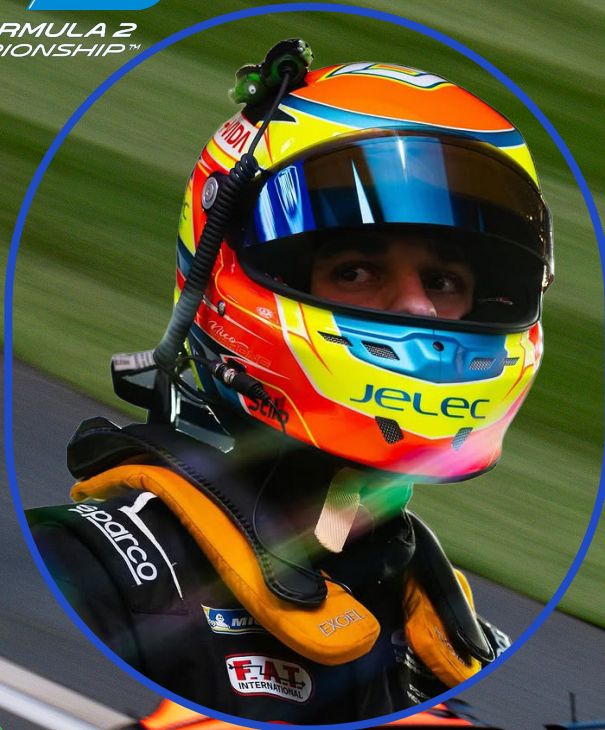
The Jelec battery cabinet serves as the core building block of our BESS platform, offering flexible configurations that can be deployed individually or integrated into larger, scalable systems. This modular approach gives customers the freedom to scale from a single cabinet to a complete facility with ease.

Multiple battery cabinet options are available:

- Power Cabinet – Designed for high C-rate performance, delivering more power
- Energy Cabinet – Optimized for longer duration discharging

	1P22S	1P34S	4P10S	1P46S	1P32S
Type	Power	Power	Energy	Power	Power
Capacity	27.3 kWh	36.6 kWh	49.7 kWh	49.5 kWh	39.7kWh
Peak Power*	175 kW	225 kW	50 kW	350 kW	240 kW
Cabinet Voltage	396...712.8 Vdc	612...1100 Vdc	180...324 Vdc	828...1490 Vdc	576...1037 Vdc
Current	39 A	39 A	45 A	39 A	45 A
Cooling	Forced Air	Forced Air	Passive	Forced Air	Liquid Cooled
Unit Dimensions	26 in (W) x 25 in (D) x 79 in (H)	26 in (W) x 25 in (D) x 91 in (H)	26 in (W) x 25 in (D) x 84 in (H)	52 in (W) x 25 in (D) x 79 in (H)	144 in (W) x 24 in (D) x 12 in (H)
Weight	1,250 lbs (565 kgs)	1,650 lbs (565 kgs)	1,850 lbs (750 kgs)	2,550 lbs (750 kgs)	1,360 lbs (750 kgs)

\* During 1 min. Actual rated power will vary based on application and lifetime considerations. Contact Jelec for optimal configuration.



**General Information**

[www.jelec.com](http://www.jelec.com)  
[info@jelec.com](mailto:info@jelec.com)  
[sales@jelec.com](mailto:sales@jelec.com)

**Jelec Headquarters**

16901 Park Row,  
Houston, TX 77084

**Jelec Katy**

1625 W. Grand Parkway N.  
Katy, TX 77493

**Telephone**

(+1) 713 977 6500



**Jelec Katy JK#2  
BESS Production Facility**



**Jelec Katy JK#1  
Fabrication Facility**



**Jelec Houston  
Headquarters & Engineering**