

WAAREE | ESS
YOUR POWER INSURANCE

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LITHIUM ION
FROM GENERATION TO UTILIZATION

INTRODUCTION



Our Journey

2020

Waaree ESS was founded in 2020. It is an integral part of Waaree Group which was founded in 1989. With a Plant Capacity of 36MWh

2021

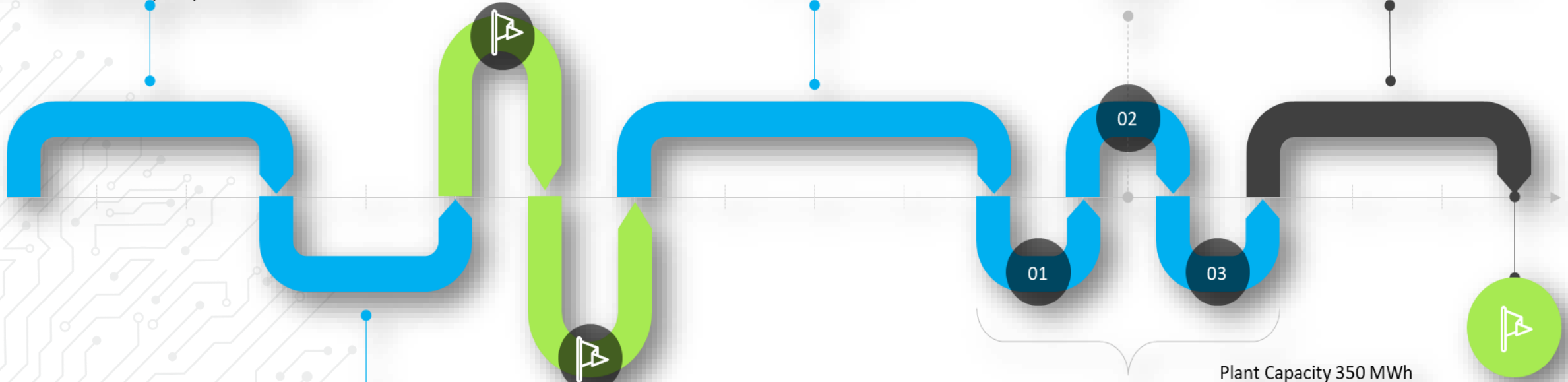
Plant Capacity 118 MWh

2022

Entered into the Traction and Telecom segment

2023

The batteries were developed according to the new AIS 0156 standard.



Developed a state-of-the-art rigorous testing, reliability facility for cell to pack level.

Milestone

In manufacturing, we added more segments in which 2W and 3W manufacturing started

Entered into the storage segment.
Completed 400+KWh projects in the very first month itself.
Complete the UPNEDA project with 153 kw*3 storage system

Group Items

Containerized BESS system launched

Planning for Plant Expansion
Capacity 1GWh by end of Jan'24

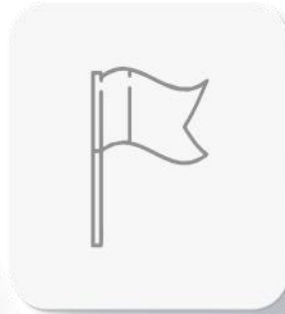
Our Purpose and Values



Safety



Respect for
Each other



Pioneer
Spirit



Stand
Together



Performance
Minded

Our vision is to create India's Top-notch "Cell to System" Technology Company offering reliable, affordable and premium quality energy storage solutions for Mobility and Renewable energy applications

About us

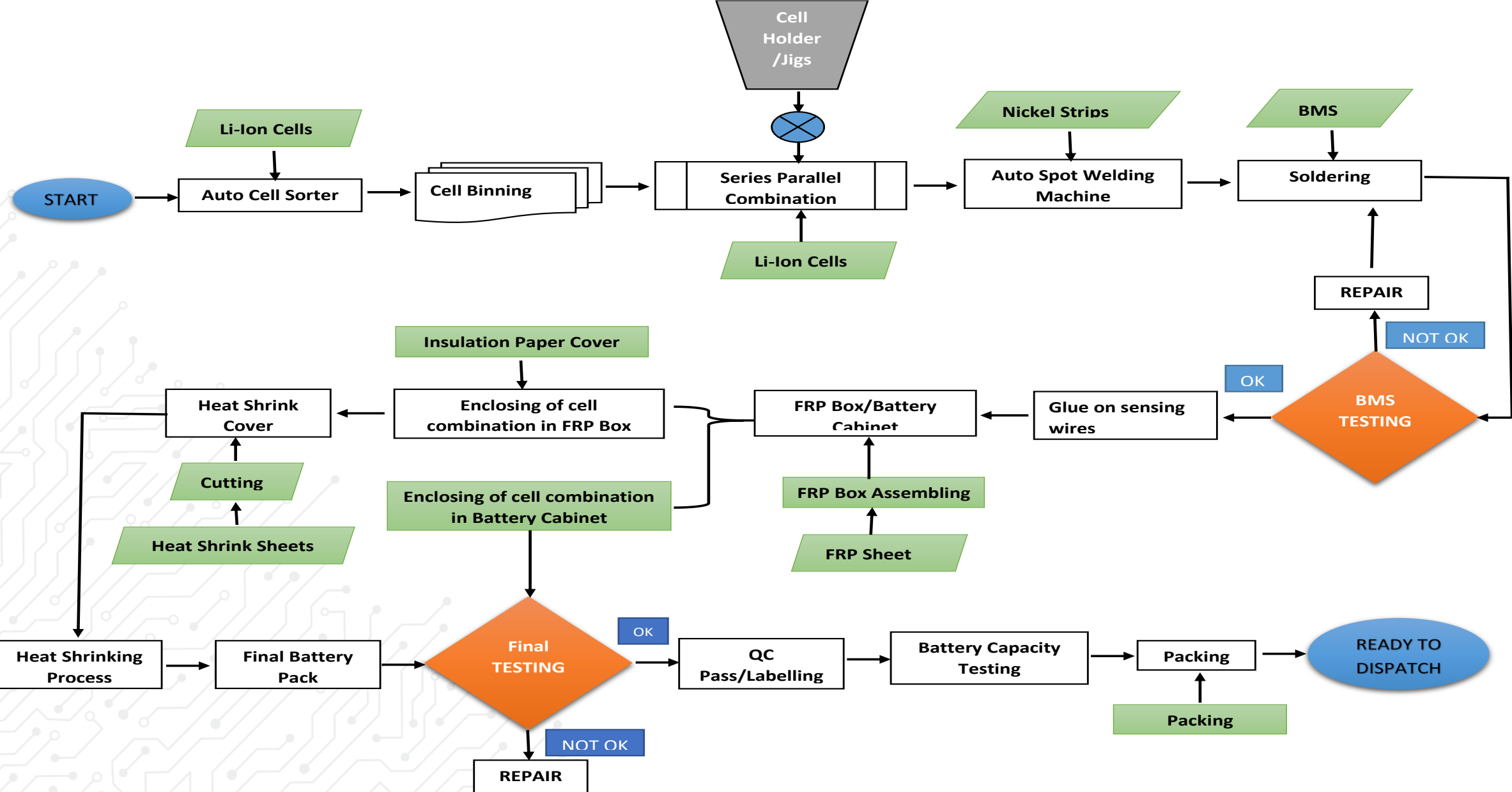
- Powering electric mobility with evolving energy storage, solutions - WESS is one of India's most promising names in the green and clean energy segments.
- Our state-of-the-art manufacturing facility at Surat, Gujarat is ISO certified. With global standards and highly scalable infrastructure, the premise spreads over an area of 40,000 sq ft. It has a production capacity of over 350MWh annually, rigorous testing and quality checking processes and in-house Design and R&D Centre, with all the necessary compliances, resources and a highly dependable team, WESS is equipped to build a greener tomorrow

State of the art Manufacturing

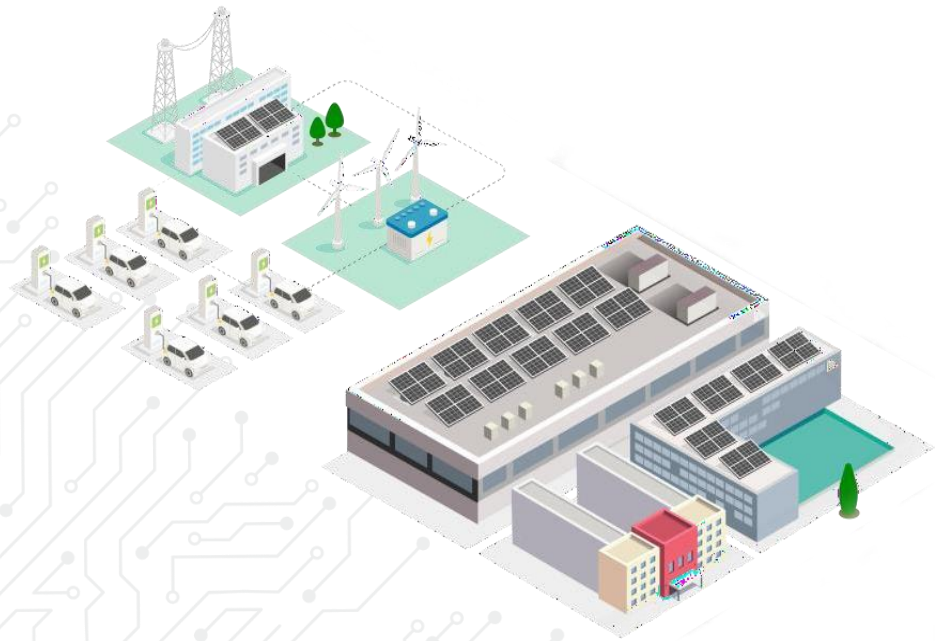


Waaree ESS facility has a Battery production capacity of 350MWh per annum capacity, hailing with an Automatic Production Line, State of the art reliability and safety testing, proprietary BMS, Customized Battery Sizes, & World Class Raw material sourcing.

MANUFACTURING PROCESS FLOW



Capacity Planning



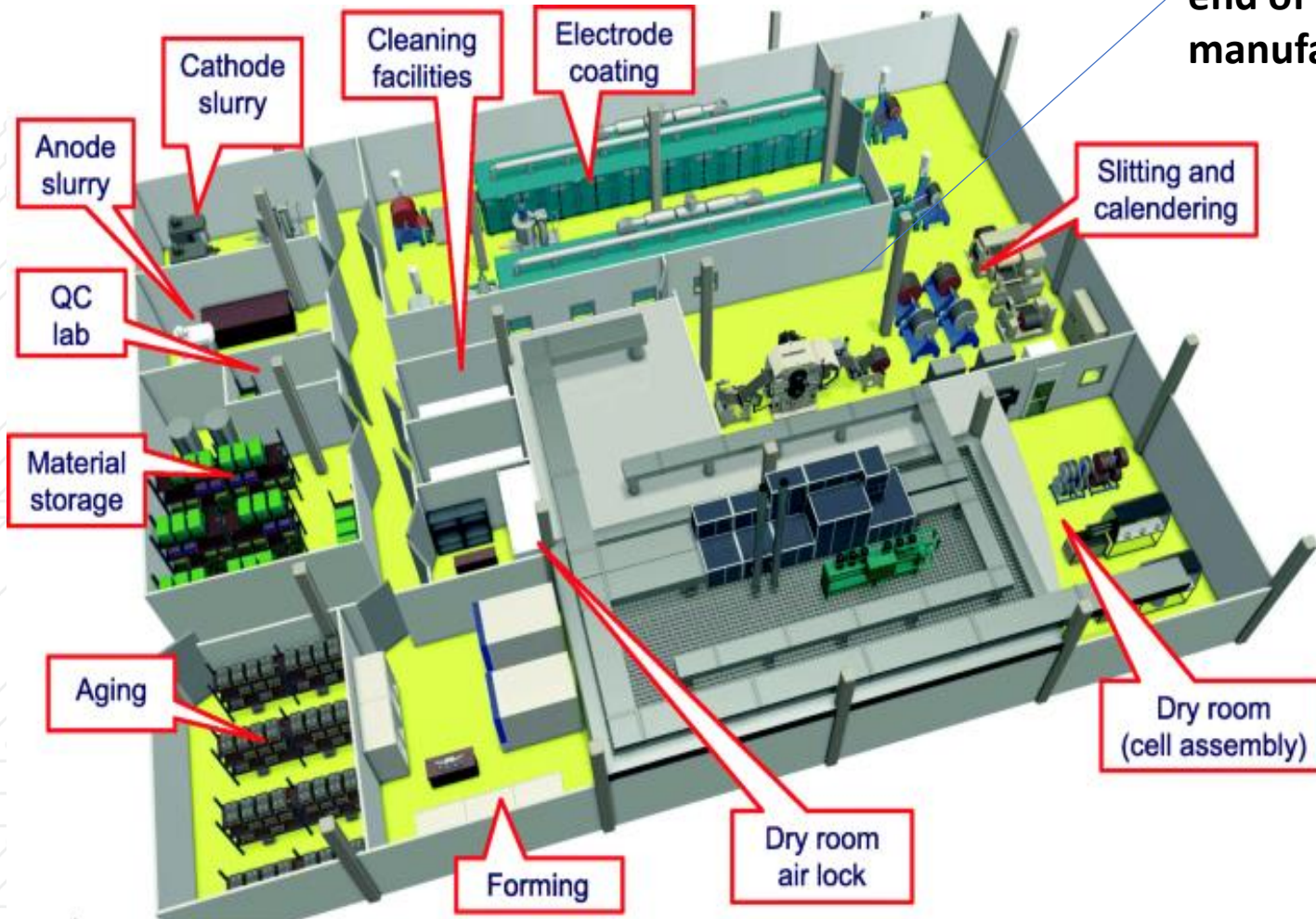
2023
Surat, Gujarat
+350 MWh

At the Start of 2024, the total production capacity will be 1GWh, and the energy storage battery capacity will be about 500MWh It is expected to reach 2GWh by 2025



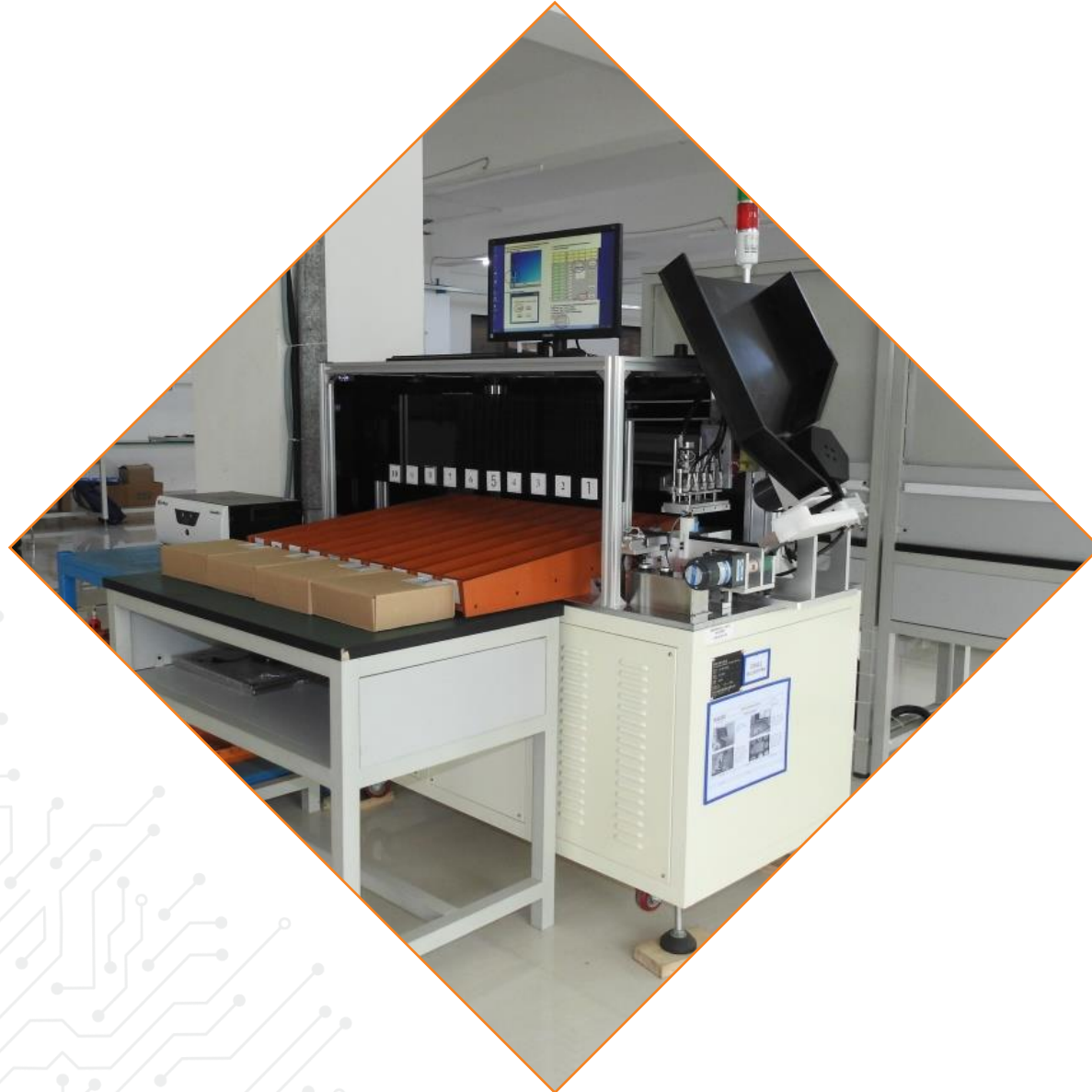
Capacity Planning

We are also Planning for Cell Manufacturing and end of 2024 we will have 500MWh cell manufacturing capacity.



QUALITY PLAN

LITHIUM-ION BATTERY DIVISION



QUALITY CHECK FLOW



INCOMING QUALITY

All the raw material tested at incoming stage prior of their usage in production line



IN PROCESS QUALITY

Established quality checks for each & every process & their sub-processes



FINAL QUALITY

Established a system check to ensure that only good and quality product move out from factory



RELIABILITY TESTING

World class Testing machine available to ensure the life cycle of the products



CONTINUAL IMPROVEMENT

Enable us to make our product reliable and better

Product Application

We have Li-ion Batteries for various applications which can be broadly classified into two groups:

Mobility



E-Bike



E-Riksha



Forklifts



Wheelchair



Golf carts

Stationary



Solar Street light



Off-Grid Solar



UPS Back Up



Power Backup System



BESS

Customer's Trust



EVs



Solar



Traction



CYGNUS MOTORS LLP.



Storage



Roadmap Product

01 Milestone
SSL, E-Cycle, 2W

12.8V - 72V



02 Milestone
3W, Traction

48V-80V



03 Milestone
DESS, ESS

48V-720V

✓ Today

04 Milestone

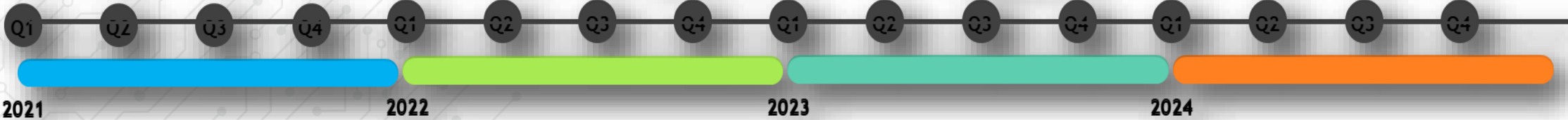
BESS, Telecom, Solar Park

48V-1100V



05 Milestone
containerized BESS

1500V



Products Certifications & 3rd Party Audits

Global Certifications



CE Certification underway

3rd Part Audits



Glimpse Of our facility

Battery Pack Lines



Testing
Facilities



BMS Testing Machine
32 Channel 200Amp



Prismatic & Cylindrical Cell
Charging & Capacity
Grouping Machine



Battery Capacity Testing Machine

Glimpse Of our facility

Reliability Testing Facility-UL1642/AIS156,AIS048



Battery Thermal Shock Tester

Ability to withstand the effect of Thermal Shock



Battery Combustion Tester

Ability to withstand the fire/combustion



Needle Tester

Ability to withstand the effect of any puncture due to harsh environment and misuse of battery packs.



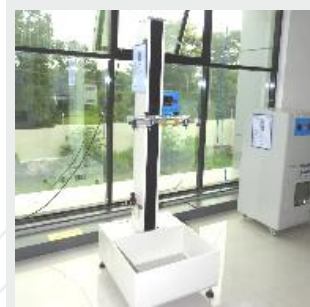
Programmable Thermal Cycle Chamber

Ability to withstand with the effect of humidity & temperature of the environment.



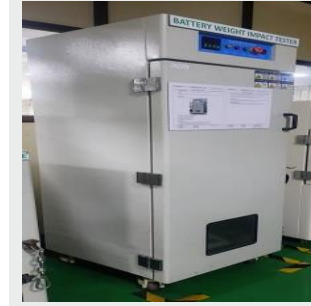
Horizontal Rain Tester

Ability to withstand the effect of rain & water ingress



Battery Drop Tester

Ability of battery packs from the drop of 1 m height



Weight Impact Tester

Ability to withstand effect of suddenly impact.

Test Condition: Impact on cell with 9.1 Kg Hammer. Impact from 610mm height.



Battery Extrusion Tester

Ability to withstand against the Crush and their impact.

Test Condition: Crush the Cell with the 13KN force. Test Duration is 1 min.

Technology Highlights



Substantial Safety

Aircraft-grade safety and reliability

WAAREE ensures safety and reliability in real scenarios with well selected and designed raw materials, multi-level protective structures, automated manufacturing processes, comprehensive testing and verification, 24-h monitoring, and big data-based early warning.



Long Service Life

Life up to 8,000 cycles.

WAAREE has upgraded key components such as the cathodes, anodes, electrolytes, and pole pieces of the battery to slow down the battery capacity loss, extend the battery life, and reduce LCOS throughout the battery life cycle.



High Energy Density

Volumetric energy density higher than 350 Wh/L

Advanced high-energy density materials and original CTP high-efficiency group technology enable the container system to achieve a floor space energy density of over 250 kWh/m².



Intelligent Temperature Control

Automatic temperature adjustment to cope with cold and heat

The intelligent thermal management system effectively avoids the bucket effect caused by the series connection of cells, guarantees the attenuation of life consistent of each cell to the greatest extent, ensures a temperature difference of cells in the container within 5°C, and improves the discharge capacity of the battery system. The integrated liquid-cooled units selected are featured in adaptive adjustment of the operating state, reducing the auxiliary loss by 30%.



Intelligent Management

24/7 protection

The BMS monitors the battery health status and identifies unhealthy batteries in advance. Intelligent internal short-circuit detection with early warning of battery fire hazards can reduce the probability of relevant fires by more than 90%. The online early warning system ensures the safe operation of battery throughout the life cycle.

Product Portfolio

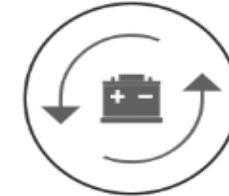


EV Batteries 2 & 3 Wheeler

24V, 48V, 60V, 72V and 80V (EV Battery)



LiFePO₄ (Lithium Iron phosphate) battery



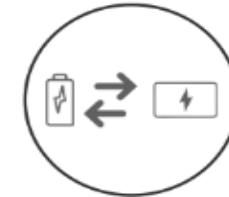
Outstanding cycle performance



Excellent recharge acceptance



Innovative robust design



Horizontal installation position for less space



Low self-discharge rate

LYNX series is Lithium Iron phosphate battery developed for electric vehicles. LYNX series LiFePO₄ battery extra-long cycle life, special in partial state of charge cycle, significantly faster recharge rates and large current performance. LYNX series is mainly designed for Electric Vehicles, Traction system.

Applications



E-Bike



E-Rickshaw



E-Forklift



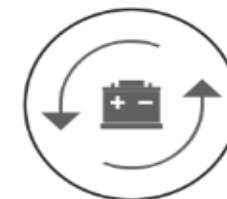
E-Bicycle

DESS Solution Combo – For Domestic Segment

12.8V-25.6V of 6Ah to 172Ah



LiFePO4 (Lithium Iron phosphate) battery



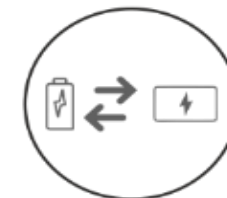
Outstanding cycle performance



Excellent recharge acceptance



Innovative robust design



Horizontal installation position for less space



Low self-discharge rate

LIT(LiFePO4) series is a complete range of 12V LiFePO4 (Lithium Iron phosphate) battery products, for a wide variety of applications, such as UPS, renewable energy system, inverter etc., with advanced life, standard size, light weight and strong environmental adaptability.

Applications



Inverter

UPS

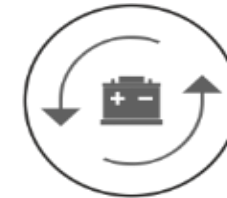
Solar Application & Renewable Energy

UESS Solution For C&I Segment

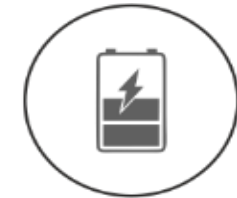
ESS Low Voltage Solution



LiFePO₄ (Lithium Iron phosphate) battery



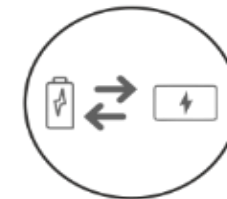
Outstanding cycle performance



Excellent recharge acceptance



Innovative robust design



Horizontal installation position for less space



Low self-discharge rate

The LION range of lithium batteries can provide outstanding cyclic performance and longer service life at high temperatures.

Applications



Home Storage



Telecom System



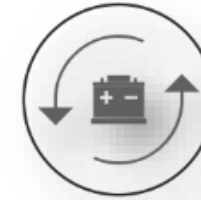
UPS

BESS Solution For Utility & Developer Segment

ESS High Voltage Solution



LiFePO₄ (Lithium Iron phosphate) battery



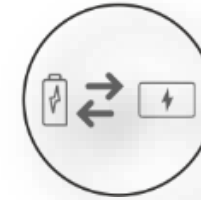
Outstanding cycle performance



Excellent recharge acceptance



Innovative robust design



Horizontal installation position for less space



Low self-discharge rate

The LIGER range of lithium batteries can provide outstanding cyclic performance and longer service life at high temperatures.

Applications



Data Center



UPS



Power Backup System



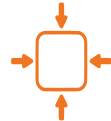
BESS

BESS Solution For Utility & Developer Segment

Rack Solutions



High level
Of Safety



Small Size/
Light weight



Long Service
Life



High level of safety/
Long service life



High
Integration



Flexible system
Configuration

Containerized Solutions



High level
Of Safety



Long Service
Life



High
Integration

Thank You

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