Automotive Division 03-March-2020 Mumbai
Agenda

Overview of current business

Strategic bets for future
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Strategic bets for future
We are working towards distinct priorities in each segment

<table>
<thead>
<tr>
<th>Segment</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade</td>
<td>Grow and transform the business to improve revenue and cost</td>
</tr>
<tr>
<td>OEM</td>
<td>Maintain the market share Exide without sacrificing margins</td>
</tr>
<tr>
<td></td>
<td>Continue to capture large part of new businesses</td>
</tr>
<tr>
<td>Exports</td>
<td>Double the size</td>
</tr>
</tbody>
</table>
Overview of Export Business
Exports will be a key pillar of growth

Our export facilities
- Branch Office has been established in UAE
- Manpower relocation to our Singapore office
- Pune Plant exports to middle east
- Haldia plant exports to south east Asia

Currently, exporting seven different brands

1. Double size the export
2. Increase the market share in SE Asia and MECA
Overview of OEM Business
Automotive industry has slowed down in the past 2 years, however key drivers of growth are getting favorable

Automotive production trends in millions

<table>
<thead>
<tr>
<th></th>
<th>Passenger Vehicles</th>
<th>Commercial Vehicles</th>
<th>Two Wheelers</th>
<th>Three Wheelers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.5</td>
<td>0.8</td>
<td>18.8</td>
<td>0.9</td>
</tr>
<tr>
<td>15-16</td>
<td>3.8</td>
<td>0.8</td>
<td>19.9</td>
<td>0.8</td>
</tr>
<tr>
<td>16-17</td>
<td>4</td>
<td>0.9</td>
<td>23.2</td>
<td>1</td>
</tr>
<tr>
<td>17-18</td>
<td>4</td>
<td>1.1</td>
<td>24.5</td>
<td>1.3</td>
</tr>
<tr>
<td>18-19</td>
<td></td>
<td></td>
<td>18.3</td>
<td></td>
</tr>
<tr>
<td>YTD-Jan'20</td>
<td>2.9</td>
<td>0.7</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

+7 % 0 % +6 % +11 % +6 %
+6 % +22 %

Though subdued but a few Optimistic Triggers Which May Increase Demand in FY2020-21

- Improvement in liquidity of NBFCs
- Reduction in interest rates
- Expected scrappage policy implementation from April-20
- Increase in rural demand due to reasonably better agriculture output
- Greater spending in Govt. Infrastructure Projects which Impacts CV demand
- Increased STU buying of buses

Source: SIAM
Overview of Replacement Business
We have the widest distribution network in the industry

- **EXIDE:** 10,000+ Direct Dealers billed directly every month, supported by a 29,000+ strong sub-dealer network
  - Over 1800 branded Exide Care outlets
- **DYNEX:** A growing network of approx. 300 Distributors helping penetrate in to Tier2/3 towns
- **SF SONIC:** 1500 Distributors & Direct Dealers driving growth

- **151 Spokes, including 18 ELCs,**
- **48,000+ Direct & Indirect Dealer Network**
- **600 FJCP Vehicles**
- **170 company owned and operated Service Centres**
- **Batmobile On-road service provided to consumers in 87 cities**
3 Power-packed brands catering to every application and market segment
Wide product portfolio for every application

- PVs
- CVs
- Tractors
- 3-WHs
- ERK
- 2WHs
- NV
- HUPS

#WhatDrivesYou
Trade channel: Large scale digitization program underway

Primary Dealers, Secondary Dealers – Portal and Apps

Role Based Access

Arteria Connect Solution

Secure Access

Integration with Dealers Billing software

Cloud connector

Tally

SAP
IT Enabled Sales Team & Channel Partners

• Connected through state-of-the-art mobility solutions
• Real time information on Stocks, Targets & Incentives
Overview of Manufacturing capacities and Technology
Expansion does not require additional investment

Expansion does not require additional investment

Multiple cost reduction initiatives underway

- Consolidation of production for 2W batteries from 4 to 2 factories
- Bringing select production operations in house
- Setting up of captive power plants
- New secondary smelter being set up with a capacity of 50,000 MT p.a

Manufacturing: Plant expansion being planned to meet the future requirement

<table>
<thead>
<tr>
<th>4W Capacity Mn Units</th>
<th>MC capacity (Mn units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Projected 21</td>
</tr>
<tr>
<td></td>
<td>Projected 39</td>
</tr>
<tr>
<td></td>
<td>39</td>
</tr>
</tbody>
</table>

4WL/2WL MotorCycle Current Projected
Expanded Positive Technology:

Key Advantages:

- Improved MF characteristics
- Less Grid weight - High Power to weight ratio
- Ensures improved corrosion resistance
- Special Antimony strip: Improves Active Material & Grid adhesion
- High productivity - Low production cost
Punched Plate Technology For 2WL:

Product Improvement:
- HIGHER PERFORMANCE
- INCREASED LIFE
- REDUCED WARRANTY

Process Improvement:
- HUGE REDUCTION IN MANPOWER
- BETTER QUALITY

The Intercell Connectors rise above the cell partition walls giving an advantage of plate height.

Using Furukawa Plate Making Technique
ULTRA Batteries for Automotive:

Advantages of Ultra Battery

- Excellent charge acceptability - 2x
- Excellent durability under HR-PSOC condition – 2.5x
- Suppress stratification under deeper discharge / charge condition by Capacitor hybrid negative electrode and Ion exchange mechanism of capacitor layer
- Fuel economy improvement (CO₂ emission reduction) - Approximately 3% improvement in fuel economy

Advantages of Ultra Battery in Hybrid Vehicles

<table>
<thead>
<tr>
<th></th>
<th>Start /Stop</th>
<th>Micro</th>
<th>Mild</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Stop</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Regenerative Braking</td>
<td></td>
<td>✓</td>
<td>✓✓</td>
</tr>
<tr>
<td>Motor Assist</td>
<td></td>
<td>✓</td>
<td>✓✓</td>
</tr>
<tr>
<td>Battery Voltage (V)</td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Considered Battery</td>
<td>Lead Acid ISS/EFB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lead Acid ISS/EFB with Li-Ion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lead acid Flooded Ultra battery</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ultra Battery system is an effective solution for 12V micro & mild hybrid!
Agenda

Overview of current business

Strategic bets for future
India is gearing up for electrification megatrend to become a reality

**Major drivers**

<table>
<thead>
<tr>
<th>Major Driver</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving cost economics</td>
<td>Falling upfront costs, Battery prices to fall</td>
</tr>
<tr>
<td>Government push</td>
<td>Improved performance, Products with better performance</td>
</tr>
<tr>
<td></td>
<td>Urban Pollution, Significantly above acceptable standards</td>
</tr>
<tr>
<td></td>
<td>CO2 Emissions, India in top CO2 emitters</td>
</tr>
<tr>
<td></td>
<td>Trade Deficit, Crude oil is 20% of 2019 imports</td>
</tr>
</tbody>
</table>

- **Traditional OEMs have started investing to transition to EVs**
- **New players with bold ambitions are entering the market**

#WhatDrivesYou
Hence, we have made two strategic investments in the automotive space

**Li-Ion Module and Pack Assembling Plant**
- Aims to become a leading provider of customized energy storage solutions
- Building prototypes for e-bus, e-3 wheeler, e-2 wheeler, and telecom

**Exide NEO**
- Launched a battery powered e-rickshaw with robust design and stylish looks
- Entered e-rickshaw market to showcase our technology prowess in Li-Ion
We are undertaking early lead in the nascent li-ion battery market in India

Our Headquarters in Prantij, Gujarat
- Nexcharge existing land: 56,680m²
- Existing built-up area: 9,528m²

Our Li-ion Assembly Lines
- Pouch/Prismatic/Cylindrical cell to module
- Module to pack/rack
- Cell testing lab
- Prototype and pilot line

Our Facility in Bengaluru, Karnataka
- Total area: 149m²
- Activity: Development Centre
- Located at RMZ Eco Space Tech Park

Our Capabilities
- Electronics and mechanical product design and testing
- Embedded software development
- IT and ITES services
Transportation

- Buses, Passenger Cars, Three Wheelers, Two Wheelers, Trucks
- Marine
- Off Highway Equipment
- Rail
- Robots
Overview: Nexcharge Development Centre

- **Associates**: 32 associates with a mix of Electrical, Electronics, Software, Mechanical & Industrial Engineering

- **Skill set**: Mech Design & simulation, Electrical Eng., Industrial Eng.

- **Software and Tools**: SOLIDWORKS, CATIA, ABAQUS, ANSYS, Altium Designer, KEIL, IAR, eclipse, .NET
## Battery Pack: Electric Bus

![e-Bus](image)

### Technical Description

<table>
<thead>
<tr>
<th>Particular</th>
<th>LFP, 640V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry, Nominal Voltage</td>
<td></td>
</tr>
<tr>
<td>Type of Cells</td>
<td>Prismatic</td>
</tr>
<tr>
<td>Pack Dimension (in mm)</td>
<td>1705 X 1653 X 235</td>
</tr>
<tr>
<td>Weight</td>
<td>~860kgs</td>
</tr>
<tr>
<td>Life Cycle @ RT</td>
<td>3500</td>
</tr>
</tbody>
</table>
Battery Pack: Two Wheeler

Electric two wheeler

Technical Description

<table>
<thead>
<tr>
<th>Particular</th>
<th>Technical Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry, Nominal Voltage</td>
<td>NMC, 50V</td>
</tr>
<tr>
<td>Type of Cells</td>
<td>Cylindrical</td>
</tr>
<tr>
<td>Pack Dimension (in mm)</td>
<td>239 X 156 X 183</td>
</tr>
<tr>
<td>Weight</td>
<td>~8 kgs</td>
</tr>
<tr>
<td>Life Cycle @ RT</td>
<td>1000</td>
</tr>
</tbody>
</table>
## Battery Pack: Three Wheeler

*Electric three wheeler*

<table>
<thead>
<tr>
<th>Technical Description</th>
<th>Particular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry, Nominal Voltage</td>
<td>LFP, 50V</td>
</tr>
<tr>
<td>Type of Cells</td>
<td>Prismatic</td>
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<tr>
<td>Pack Dimension (in mm)</td>
<td>239 X 156 X 183</td>
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<tr>
<td>Weight</td>
<td>~37 kgs</td>
</tr>
<tr>
<td>Life Cycle @ RT</td>
<td>3500</td>
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</table>
The Manufacturing and R&D set-up will be one of India's most advanced for Li-ion pack assembly

<table>
<thead>
<tr>
<th>State of the Art Manufacturing</th>
<th>R&amp;D innovation center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total HV capacity of ~500 mWh and LV capacity of ~250 mWh</td>
<td>R&amp;D innovation center in Bangalore with 30+ electrical and mechanical design engineers</td>
</tr>
<tr>
<td>7 assembly lines for different form factors and voltages</td>
<td>Software for pre-processing and simulation of different design ideas</td>
</tr>
<tr>
<td>Automated setup with limited manual intervention</td>
<td>Software for developing Battery Management System</td>
</tr>
<tr>
<td>Flexibility to handle any form-factor and chemistry for Li-Ion battery</td>
<td>Comprehensive equipment for testing (Life Cycle Tester, Temperature Testers)</td>
</tr>
</tbody>
</table>
Thank You