

Train Battery Market by Type & Technology (Lead-acid Tubular, VRLA, Conventional; Ni-Cd Sinter, Fiber, Pocket, & Li-ion; LFP, LTO), Advanced Train (Fully Battery-Operated and Hybrid), Rolling Stock Type, Application and Region - Global Forecast to 2030

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Abstracts

The train battery market is projected to grow from USD 277 Million in 2023 to USD 378 Million by 2030, at a CAGR of 4.6% from 2023 to 2030. The train battery market is primarily driven by factors such as rapid urbanization and the growing expansion of railway networks. Along with these factors, the swiftness of rail travel and low operational cost compared to other modes of transport are driving governments all over the globe to invest in urban rail infrastructure. The growing expansion of rail networks is expected to create a demand for energy storage systems.

As of 2021, Urban Transport Trends and Prospects (UTTP) indicates that there is a total operational network of light rails and trams spanning 15,824 kilometers. Most of these networks are situated in Europe, accounting for 58% of the total, while Eurasia constitutes 22%. Notably, several European countries, including Finland, the UK, and Switzerland, are actively focusing on expanding their light rail networks. For instance, in 2021, the UK government approved the extension of the Blackpool Tram. Additionally, the increasing development of metro projects is contributing to the rising demand for batteries in metro systems. As an example, in December 2022, the Russian government initiated the construction of the 70-km Moscow Big Circle Line metro project, with a total cost of USD 6.8 billion. Consequently, the growth of light rail and tram networks, coupled with the growing adoption of metro systems for urban transit, is expected to fuel the utilization of batteries in these modes of transportation in the upcoming years.

“The Auxiliary Batteries are expected to account for the largest market share in 2023.”

The auxiliary battery systems provide backup to all essential train systems, such as emergency lighting and ventilation. Auxiliary batteries also offer safety to the train without output failure and train separation incidents. Additionally, the increase in the demand for high-speed trains is leading to the high demand for advanced features such as emergency braking, tilting systems, etc. VRLA technology holds the largest share in the train battery market due to its technical benefits such as maintenance-free operation, no periodic water filling requirement, fast charging capability, and heat & shock resistance, and is mainly preferred for auxiliary functions in railways. However, the high energy density, good low-temperature performance, and good cycle life means can be recharged more times than VRLA batteries. Hence, considering these benefits of Ni-cd batteries, the demand for VRLA batteries in railways will be impacted gradually. Moreover, the latest rolling stocks have been implementing advanced technologies such as the Internet of Things (IoT), artificial intelligence (AI), deep learning, and driver advisory systems (DAS) to improve efficiency and enhance the passenger experience. Improvements in resource planning, passenger experience, and decision-making, along with the optimization of field equipment such as ACs, heaters, braking systems, and other onboard appliances, are expected to increase the adoption rate of train batteries for these auxiliary systems.

“Passenger Coaches will dominate the train battery market during the forecast period.”

Passenger coaches are railroad cars designed to carry passengers. Modern passenger coaches require auxiliary batteries for functions such as reading lights, bathroom lights, vestibule lights, door lights, emergency lights, HVACs, fans, screens, Wi-Fi, and ceiling lights. These functions depend upon the types of coaches, such as AC and non-AC coaches. In developed countries, coaches have automated doors, infotainment systems, and passenger information systems. These added features are powered through battery power packs. The battery capacity for AC coaches is higher compared to non-AC passenger coaches. Typically, the voltage capacity requirement for passenger capacity is 108V to 120V. Batteries installed in passenger coaches are used for auxiliary power backup. Based on the capacity and power output of the passenger coach, the manufacturer decides the battery chemistry. With increased travel demand, environmental concerns, government investments, improved passenger amenities, safety and reliability, high-speed rail development, intermodal connectivity, and reduced congestion, the need for passenger coaches and train batteries would grow parallelly in the coming years.

“Asia Pacific is expected to account for the largest aftermarket share in 2022.”

The Asia Pacific region has the world's most extensive railway network and holds the top spot in the global count of rolling stock. Furthermore, it stands as the world's largest producer of rolling stock. This geographical concentration of major rolling stock manufacturers has notably driven the demand for train batteries.

Moreover, with the widespread urban rail network expansion and the presence of international train battery manufacturers in the region, an anticipated rise in demand is foreseen. This is further compounded by the escalating number of passengers, which will necessitate increased utilization of train batteries to enhance the overall travel experience. Rail network electrification, emission regulations, and advancements in battery technologies are expected to drive train battery aftermarket in Asia Pacific. The growing diesel engine retrofitting and refurbishment at a year-on-year rate of 5%. Further, trains operating in the Asia Pacific region are at high temperatures compared to Europe and North America due to which battery lifespan in the Asia Pacific region is less, thus the demand for battery replacement is high.

Breakdown of Primaries

In-depth interviews were conducted with CXOs, marketing directors, other innovation and technology directors, and executives from various key organizations operating in this market.

By Company Type: Supply Side- 60%, Demand -Side- 20%, and Others - 20%

By Designation: C Level Executives - 20%, Directors/ Vice Presidents-30%, and Others -50%

By Region: North America - 20%, Asia Pacific- 40%, Europe - 30%, and Rest of the World – 10%

The train battery market comprises major manufacturers such as EnerSys (US), Exide Industries (India), Saft (France), Amara Raja Batteries (India), GS Yuasa Corporation (Japan), and HOPPECKE Batterien GmbH & Co.KG.

Research Coverage

The study segments the train battery market and forecasts the market size based on by

Train Battery Market by Type & Technology (Lead-acid Tubular, VRLA, Conventional; Ni-Cd Sinter, Fiber, Pocket,...

Application & by Battery type Starter (Lead-Acid, Nickel-Cadmium, Lithium-ion) and Auxiliary (Lead-Acid, Nickel-Cadmium, Lithium-ion, By Battery Type & Battery Technology Lead-Acid Battery (Conventional Lead Acid Battery, Valve Regulated Lead Acid Battery, Gel Tubular Lead Acid Battery) Nickel-Cadmium Battery (Sinter/PNE Ni-Cd Battery, Pocket Plate Ni-Cd Battery, Fiber/PNE Ni-Cd Battery) Lithium-ion Battery (Lithium Iron Phosphate (LFP), Lithium Titanate Oxide (LTO), and Others), By Engines/Head (Diesel Locomotives, Diesel Multiple Units (DMUs), Electric Locomotives, and Electric Multiple Units (EMUs), By Application (Metros, High-speed Trains, Light Trains/Trams/ Monorails, Passenger Coaches), By Advanced Train Type (Battery-Powered Train, and Hybrid Trains), Aftermarket by Rolling Stock (Locomotives, Multiple Units, Passenger Coaches), Aftermarket By Battery Type (lead-Acid, Nickel-Cadmium, Lithium-Ion), Aftermarket by application (starter battery, and auxiliary function battery), Aftermarket by region (Asia Pacific, Europe, and North America), and OE by region (Asia Pacific, Europe, North America and Rest of the World).

Key Benefits of Buying the Report:

This report provides insights concerning the following points:

Country-level battery type-wise market: The report offers in-depth market sizing and forecasts for 2030 by battery types, such as lead-acid, nickel-cadmium, and lithium-ion. The market sizing for the train battery market is covered at the country and regional levels considered in this study.

By Application & battery type: The report offers in-depth market sizing and forecasts up to 2030 by applications, such as starter and auxiliary—in-depth analysis of different battery types used in Starter and Auxiliary Applications at the regional level.

Battery Type, by Battery Technology: The report offers in-depth market sizing and forecasts up to 2030 by battery type, such as lead-acid, nickel-cadmium, and lithium-ion. The report provides market sizing and forecasting till 2030 by battery technology under different battery types such as lead acid battery type (conventional lead-acid, Valve regulated lead-acid, and gel tubular lead-acid battery), Nickel-cadmium (Sinter/PNE Ni-Cd, Pocket Plate Ni-Cd, and Fiber/Pne Ni-Cd), and Lithium-ion (lithium iron phosphate (LFP), Lithium Titanate Oxide)

The report provides the “Market Share” of the leading train battery market players.

Market Development: The report provides comprehensive information about lucrative emerging markets across regions for the train battery market.

Product Development/Innovation: The report gives detailed insights into R&D activities, upcoming technologies, and new product launches in the train battery market.

Market Diversification: The report offers detailed information about untapped markets, investments, new products, and recent developments in the train battery market.

The report provides insights on the following pointers:

Analysis of key drivers (Growth in adoption of autonomous and high-speed railways, Emission regulations to increase demand for energy-efficient transportation systems, and Expansion of railway networks), Restraints (High capital investment and operating cost of high-speed rail networks), Opportunities (Expansion of IOT, AI, and DAS Technologies, Improvements in Battery Technology, Retrofitting of Diesel-electric trains), Challenges (Technical Challenges related to lead-acid and lithium-ion batteries, High cost of charging infrastructure and replacement).

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the train battery market.

Market Development: Comprehensive information about lucrative markets – the report analyses the train battery market across different regions.

Market Diversification: Exhaustive information about new products & services, untapped geographies, recent developments, and investments in the train battery market.

Competitive Assessment: In-depth assessment of market shares, growth strategies, and service offerings of leading players like EnerSys (US), Exide Industries (India), Saft (France), Amara Raja Batteries (India), GS Yuasa Corporation (Japan), and HOPPECKE Batterien GmbH & Co.KG. in the train

battery market.

Contents

1 INTRODUCTION

1.1 STUDY OBJECTIVES

1.2 MARKET DEFINITION

1.2.1 INCLUSIONS AND EXCLUSIONS

TABLE 1 SEGMENT-WISE INCLUSIONS AND EXCLUSIONS

1.3 MARKET SCOPE

FIGURE 1 MARKETS COVERED

1.3.1 REGIONS COVERED

1.3.2 YEARS CONSIDERED

1.4 CURRENCY CONSIDERED

TABLE 2 CURRENCY EXCHANGE RATES

1.5 STAKEHOLDERS

1.6 SUMMARY OF CHANGES

2 RESEARCH METHODOLOGY

2.1 RESEARCH DATA

FIGURE 2 RESEARCH DESIGN

FIGURE 3 RESEARCH METHODOLOGY MODEL

2.1.1 SECONDARY DATA

2.1.1.1 List of key secondary sources to estimate base numbers and market size
(Locomotive & Rolling Stock)

2.1.1.2 Key data from secondary sources

2.1.2 PRIMARY DATA

FIGURE 4 BREAKDOWN OF PRIMARY INTERVIEWS

2.1.2.1 Sampling techniques and data collection methods

2.1.3 PRIMARY PARTICIPANTS

2.2 MARKET SIZE ESTIMATION

FIGURE 5 RESEARCH METHODOLOGY: HYPOTHESIS BUILDING

2.2.1 BOTTOM-UP APPROACH: TRAIN BATTERY MARKET, BY BATTERY TYPE
AND ROLLING STOCK

FIGURE 6 BOTTOM-UP APPROACH, BY BATTERY TYPE AND ROLLING STOCK

2.2.2 TOP-DOWN APPROACH: TRAIN BATTERY MARKET, BY BATTERY
TECHNOLOGY

FIGURE 7 TOP-DOWN APPROACH, BY BATTERY TECHNOLOGY

2.3 FACTOR ANALYSIS FOR MARKET SIZING: DEMAND AND SUPPLY SIDES

2.4 FACTOR ANALYSIS

2.5 RECESSION IMPACT

2.6 MARKET BREAKDOWN AND DATA TRIANGULATION

FIGURE 8 DATA TRIANGULATION

2.7 RISKS AND ASSUMPTIONS

2.7.1 RESEARCH ASSUMPTIONS

2.7.2 MARKET ASSUMPTIONS

TABLE 3 MARKET ASSUMPTIONS: NUMBER OF BATTERIES COUNT IN EACH ROLLING STOCK

TABLE 4 MARKET ASSUMPTIONS: NUMBER OF BATTERIES COUNT IN ADVANCED TRAINS

TABLE 5 MARKET ASSUMPTIONS AND RISK ANALYSIS

2.8 RESEARCH LIMITATIONS

3 EXECUTIVE SUMMARY

3.1 REPORT SUMMARY

FIGURE 9 TRAIN BATTERY MARKET OUTLOOK

FIGURE 10 TRAIN BATTERY MARKET, BY REGION, 2023 VS. 2030 (USD MILLION)

4 PREMIUM INSIGHTS

4.1 ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN TRAIN BATTERY MARKET

FIGURE 11 DEVELOPMENT OF HIGH-SPEED TRAINS AND EXPANSION OF URBAN RAIL NETWORKS TO DRIVE MARKET

4.2 TRAIN BATTERY MARKET, BY BATTERY TYPE

FIGURE 12 NICKEL-CADMIUM BATTERIES SEGMENT TO HOLD LARGEST MARKET SHARE DURING FORECAST PERIOD

4.3 TRAIN BATTERY MARKET, BY APPLICATION

FIGURE 13 AUXILIARY BATTERIES SEGMENT TO REGISTER HIGHEST CAGR DURING FORECAST PERIOD

4.4 TRAIN BATTERY MARKET, BY BATTERY TECHNOLOGY

FIGURE 14 SINTER/PNE NI-CD SEGMENT TO LEAD MARKET DURING FORECAST PERIOD

4.5 TRAIN BATTERY MARKET, BY ENGINE/HEAD

FIGURE 15 ELECTRIC LOCOMOTIVES SEGMENT TO REGISTER HIGHEST CAGR DURING FORECAST PERIOD

4.6 TRAIN BATTERY MARKET, BY RAILWAY APPLICATION

FIGURE 16 PASSENGER COACHES SEGMENT TO HOLD LARGEST MARKET

SHARE DURING FORECAST PERIOD

4.7 TRAIN BATTERY MARKET, BY ADVANCED TRAIN TYPE

FIGURE 17 FULLY BATTERY-OPERATED TRAINS SEGMENT TO WITNESS HIGHER CAGR THAN HYBRID TRAINS SEGMENT DURING FORECAST PERIOD

4.8 TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK

FIGURE 18 COACHES SEGMENT TO LEAD AFTERMARKET DURING FORECAST PERIOD

4.9 TRAIN BATTERY AFTERMARKET, BY BATTERY TYPE

FIGURE 19 LEAD-ACID BATTERIES SEGMENT TO HOLD LARGER MARKET SHARE THAN NICKEL-CADMIUM BATTERIES SEGMENT DURING FORECAST PERIOD

4.10 TRAIN BATTERY AFTERMARKET, BY APPLICATION

FIGURE 20 AUXILIARY BATTERIES SEGMENT TO REGISTER HIGHER CAGR THAN STARTER BATTERIES SEGMENT DURING FORECAST PERIOD

4.11 TRAIN BATTERY AFTERMARKET, BY REGION

FIGURE 21 ASIA PACIFIC TO LEAD AFTERMARKET DURING FORECAST PERIOD

4.12 TRAIN BATTERY MARKET, BY REGION

FIGURE 22 ASIA PACIFIC ESTIMATED TO ACCOUNT FOR LARGEST MARKET SHARE IN 2023

5 MARKET OVERVIEW

5.1 INTRODUCTION

5.2 MARKET DYNAMICS

FIGURE 23 TRAIN BATTERY MARKET: DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES

5.2.1 DRIVERS

5.2.1.1 Increasing adoption of autonomous and high-speed railways

FIGURE 24 LENGTH OF HIGH-SPEED RAIL LINES IN OPERATION, BY REGION, 2022

TABLE 6 GRADE OF RAIL AUTOMATION

TABLE 7 LIST OF SEMI-AUTONOMOUS AND AUTONOMOUS METROS

FIGURE 25 EVOLUTION OF GOA4 INFRASTRUCTURE, 2012–2020

5.2.1.2 Stringent emission regulations

FIGURE 26 TOTAL COST OF OWNERSHIP COMPARISON FOR AVERAGE US CLASS I LINE-HAUL ELECTRIC AND DIESEL FREIGHT LOCOMOTIVES, 2001–2021

TABLE 8 RECENT DEVELOPMENTS IN BATTERY OR HYDROGEN FUEL CELL-BASED LOCOMOTIVES

5.2.1.3 Expansion of railway networks

TABLE 9 UPCOMING KEY RAIL PROJECTS, BY COUNTRY**5.2.2 RESTRAINTS**

5.2.2.1 High capital investment and operating cost of high-speed rail networks

5.2.3 OPPORTUNITIES

5.2.3.1 Expansion of IoT, AI, and DAS technologies

5.2.3.2 Improvements in battery technology

5.2.3.3 Retrofitting of diesel-electric trains

5.2.4 CHALLENGES

5.2.4.1 Technical challenges related to lead-acid and lithium-ion batteries

FIGURE 27 BATTERY CHEMISTRY COMPARISON

5.2.4.2 High cost of charging infrastructure and replacement

5.3 TRENDS AND DISRUPTIONS IMPACTING CUSTOMER BUSINESS**5.4 MARKET ECOSYSTEM****FIGURE 28 TRAIN BATTERY MARKET ECOSYSTEM**

5.4.1 TRAIN BATTERY MANUFACTURERS

5.4.2 COMPONENT/RAW MATERIAL SUPPLIERS

5.4.3 TRAIN OEMS

5.4.4 GOVERNMENT AND REGULATORY AUTHORITIES

FIGURE 29 TRAIN BATTERY MARKET SEGMENT ECOSYSTEM

5.4.5 DEALERS AND DISTRIBUTORS

5.4.6 SERVICE & REPAIR PROVIDERS

TABLE 10 TRAIN BATTERY MARKET: ROLE OF COMPANIES IN ECOSYSTEM**5.5 VALUE CHAIN ANALYSIS****FIGURE 30 TRAIN BATTERY MARKET: VALUE CHAIN ANALYSIS****5.6 SUPPLY CHAIN ANALYSIS****FIGURE 31 TRAIN BATTERY MARKET: SUPPLY CHAIN ANALYSIS****5.7 REGULATORY LANDSCAPE****TABLE 11 NORTH AMERICA: LOCOMOTIVE AND BATTERY SYSTEMS****REGULATIONS****TABLE 12 EUROPE: LOCOMOTIVE AND BATTERY SYSTEMS REGULATIONS****TABLE 13 ASIA PACIFIC: LOCOMOTIVE AND BATTERY SYSTEMS REGULATIONS****5.7.1 REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS****TABLE 14 NORTH AMERICA: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS****TABLE 15 EUROPE: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS****TABLE 16 ASIA PACIFIC: LIST OF REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS**

5.8 TRADE ANALYSIS

5.8.1 IMPORT DATA

5.8.1.1 US

TABLE 17 US: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.1.2 Canada

TABLE 18 CANADA: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.1.3 Japan

TABLE 19 JAPAN: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.1.4 India

TABLE 20 INDIA: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.1.5 Germany

TABLE 21 GERMANY: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.1.6 France

TABLE 22 FRANCE: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.1.7 Spain

TABLE 23 SPAIN: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.1.8 UK

TABLE 24 UK: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (IMPORT VALUE %)

5.8.2 EXPORT DATA

5.8.2.1 US

TABLE 25 US: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (EXPORT VALUE %)

5.8.2.2 China

TABLE 26 CHINA: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (EXPORT VALUE %)

5.8.2.3 Japan

TABLE 27 JAPAN: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (EXPORT VALUE %)

5.8.2.4 Germany

TABLE 28 GERMANY: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (EXPORT VALUE %)

5.8.2.5 France

TABLE 29 FRANCE: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (EXPORT VALUE %)

5.8.2.6 Spain

TABLE 30 SPAIN: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (EXPORT VALUE %)

5.8.2.7 UK

TABLE 31 UK: RAIL LOCOMOTIVES POWERED BY ELECTRIC ACTUATORS (BATTERIES), BY COUNTRY (EXPORT VALUE %)

5.9 PRICING ANALYSIS

5.9.1 TRAIN BATTERY PRICING, BY REGION

TABLE 32 AVERAGE SELLING PRICE TREND, BY REGION, 2020 VS. 2022

5.9.2 TRAIN BATTERY PRICING, BY BATTERY TYPE

TABLE 33 AVERAGE SELLING PRICE TREND, BY BATTERY TYPE, 2020 VS. 2022

5.10 TECHNOLOGICAL ANALYSIS

5.10.1 OVERVIEW

5.10.1.1 MITRAC pulse traction batteries

5.10.1.2 MRX nickel batteries

5.10.1.3 Solid-state batteries

5.10.1.4 Lithium-sulfur batteries

5.11 PATENT ANALYSIS

5.12 CASE STUDY ANALYSIS

5.12.1 CASE STUDY 1: PROJECT OF SEPTA AND VIRIDITY ENERGY TO INCREASE OPERATIONAL EFFICIENCY WITH LESS ENERGY CONSUMPTION

5.12.2 CASE STUDY 2: RELIABLE AUTONOMOUS BATTERY SOLUTIONS FOR HARSH WEATHER FROM SAFT TO VR GROUP

5.12.3 CASE STUDY 3: EMERGENCY BATTERY SYSTEM FROM SAFT TO CHENGDU METRO

5.12.4 CASE STUDY 4: LITHIUM-ION BATTERY SOLUTIONS FROM SAFT TO ALSTROM TRANSPORT FOR DIFFERENT WEATHER CONDITIONS AND HIGH-VIBRATING ENVIRONMENTS

5.12.5 CASE STUDY 5: DEVELOPMENT OF HYBRID TRAIN FOR NON-ELECTRIFIED SUBSECTIONS OF LINE

5.12.6 CASE STUDY 6: ELECTRIFICATION OF RAIL MILLING TRAINS FOR EMISSION-FREE TRACK MAINTENANCE

5.12.7 CASE STUDY 7: PARTNERSHIP BETWEEN HITACHI AND TURNTIDE TECHNOLOGIES TO PROVIDE MORE SUSTAINABLE RAIL JOURNEYS IN UK

5.13 KEY CONFERENCES AND EVENTS

5.13.1 TRAIN BATTERY MARKET: LIST OF CONFERENCES AND EVENTS,

2023–2024

5.14 BUYING CRITERIA

FIGURE 32 KEY BUYING CRITERIA FOR NICKEL-CADMIUM VS. LITHIUM-ION BATTERIES

TABLE 34 KEY BUYING CRITERIA FOR NICKEL-CADMIUM VS. LITHIUM-ION BATTERIES

5.15 BILL OF MATERIALS

FIGURE 33 COMPARISON OF BILL OF MATERIALS OF LEAD-ACID AND NI-CD BATTERIES, 2023

6 TRAIN BATTERY MARKET, BY APPLICATION & BATTERY TYPE

6.1 INTRODUCTION

6.1.1 INDUSTRY INSIGHTS

FIGURE 34 TRAIN BATTERY MARKET, BY APPLICATION, 2023 VS. 2030 (USD MILLION)

TABLE 35 TRAIN BATTERY MARKET, BY APPLICATION, 2018–2022 (UNITS)

TABLE 36 TRAIN BATTERY MARKET, BY APPLICATION, 2023–2030 (UNITS)

TABLE 37 TRAIN BATTERY MARKET, BY APPLICATION, 2018–2022 (USD MILLION)

TABLE 38 TRAIN BATTERY MARKET, BY APPLICATION, 2023–2030 (USD MILLION)

6.2 STARTER BATTERIES

TABLE 39 STARTER BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 40 STARTER BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 41 STARTER BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 42 STARTER BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

6.2.1 LEAD-ACID BATTERIES

6.2.1.1 Easy transportation and value for cost to increase demand in rail sector

TABLE 43 LEAD-ACID: STARTER BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 44 LEAD-ACID: STARTER BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 45 LEAD-ACID: STARTER BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 46 LEAD-ACID: STARTER BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

6.2.2 NI-CD BATTERIES

6.2.2.1 Uninterruptible power supply and high current supply for diesel starting

motors to drive demand

TABLE 47 NI-CD: STARTER BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 48 NI-CD: STARTER BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 49 NI-CD: STARTER BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 50 NI-CD: STARTER BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

6.3 AUXILIARY BATTERIES

TABLE 51 AUXILIARY BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 52 AUXILIARY BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 53 AUXILIARY BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 54 AUXILIARY BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

6.3.1 LEAD-ACID BATTERIES

6.3.1.1 Cost competitiveness and durability to increase demand in rail sector

TABLE 55 LEAD-ACID: AUXILIARY BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 56 LEAD-ACID: AUXILIARY BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 57 LEAD-ACID: AUXILIARY BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 58 LEAD-ACID: AUXILIARY BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

6.3.2 NI-CD BATTERIES

6.3.2.1 High energy density, longer lifespan, and ability to deliver high currents to increase market penetration

TABLE 59 NI-CD: AUXILIARY BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 60 NI-CD: AUXILIARY BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 61 NI-CD: AUXILIARY BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 62 NI-CD: AUXILIARY BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

6.3.3 LITHIUM-ION BATTERIES

6.3.3.1 Fast charging time, longer lifespan, and high energy density to drive adoption in rolling stock

TABLE 63 LITHIUM-ION: AUXILIARY BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 64 LITHIUM-ION: AUXILIARY BATTERY MARKET, BY REGION, 2023–2030

(UNITS)

TABLE 65 LITHIUM-ION: AUXILIARY BATTERY MARKET, BY REGION, 2018–2022
(USD MILLION)

TABLE 66 LITHIUM-ION: AUXILIARY BATTERY MARKET, BY REGION, 2023–2030
(USD MILLION)

7 TRAIN BATTERY MARKET, BY BATTERY TYPE & BATTERY TECHNOLOGY

7.1 INTRODUCTION

7.1.1 INDUSTRY INSIGHTS

FIGURE 35 TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023 VS. 2030 (USD MILLION)

TABLE 67 TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 68 TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 69 TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 70 TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

7.2 LEAD-ACID BATTERIES

TABLE 71 LEAD-ACID BATTERY MARKET, BY BATTERY TECHNOLOGY, 2018–2022 (UNITS)

TABLE 72 LEAD-ACID BATTERY MARKET, BY BATTERY TECHNOLOGY, 2023–2030 (UNITS)

7.2.1 CONVENTIONAL LEAD-ACID BATTERIES

7.2.1.1 Growing popularity of VRLA batteries to impact demand for conventional lead-acid batteries

TABLE 73 CONVENTIONAL LEAD-ACID BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 74 CONVENTIONAL LEAD-ACID BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

7.2.2 VALVE-REGULATED LEAD-ACID BATTERIES

7.2.2.1 High reliability and low cost of ownership to drive market

TABLE 75 VALVE-REGULATED LEAD-ACID BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 76 VALVE-REGULATED LEAD-ACID BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

7.2.3 GEL TUBULAR LEAD-ACID BATTERIES

7.2.3.1 High current applications to increase demand

TABLE 77 GEL TUBULAR LEAD-ACID BATTERY MARKET, BY REGION, 2018–2022

(UNITS)

TABLE 78 GEL TUBULAR LEAD-ACID BATTERY MARKET, BY REGION, 2023–2030

(UNITS)

7.3 NICKEL-CADMIUM BATTERIES

TABLE 79 NICKEL-CADMIUM BATTERY MARKET, BY BATTERY TECHNOLOGY, 2018–2022 (UNITS)

TABLE 80 NICKEL-CADMIUM BATTERY MARKET, BY BATTERY TECHNOLOGY, 2023–2030 (UNITS)

7.3.1 SINTER/PNE NICKEL-CADMIUM BATTERIES

7.3.1.1 Good chargeability and longer life cycle to drive demand

TABLE 81 SINTER/PNE NICKEL-CADMIUM BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 82 SINTER/PNE NICKEL-CADMIUM BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

7.3.2 POCKET PLATE NICKEL-CADMIUM BATTERIES

7.3.2.1 Lower energy density capacity and short lifetime to impact demand

TABLE 83 POCKET PLATE NICKEL-CADMIUM BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 84 POCKET PLATE NICKEL-CADMIUM BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

7.3.3 FIBER/PNE NICKEL-CADMIUM BATTERIES

7.3.3.1 Reduction in shortcomings of second-generation nickel-cadmium battery technology to drive demand

TABLE 85 FIBER/PNE NICKEL-CADMIUM BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 86 FIBER/PNE NICKEL-CADMIUM BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

7.4 LITHIUM-ION BATTERIES

TABLE 87 LITHIUM-ION BATTERY MARKET, BY BATTERY TECHNOLOGY, 2018–2022 (UNITS)

TABLE 88 LITHIUM-ION BATTERY MARKET, BY BATTERY TECHNOLOGY, 2023–2030 (UNITS)

7.4.1 LITHIUM IRON PHOSPHATE BATTERIES

7.4.1.1 Good chargeability and longer life cycle to drive demand

TABLE 89 LITHIUM IRON PHOSPHATE BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 90 LITHIUM IRON PHOSPHATE BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

7.4.2 LITHIUM TITANATE OXIDE BATTERIES

7.4.2.1 Fast charging capability to drive demand

TABLE 91 LITHIUM TITANATE OXIDE BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 92 LITHIUM TITANATE OXIDE BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

7.4.3 OTHERS

TABLE 93 OTHER LITHIUM-ION BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 94 OTHER LITHIUM-ION BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

8 TRAIN BATTERY MARKET, BY ENGINE/HEAD

8.1 INTRODUCTION

8.1.1 INDUSTRY INSIGHTS

FIGURE 36 TRAIN BATTERY MARKET, BY ENGINE/HEAD, 2023 VS. 2030 (USD MILLION)

TABLE 95 TRAIN BATTERY MARKET, BY ENGINE/HEAD, 2018–2022 (UNITS)

TABLE 96 TRAIN BATTERY MARKET, BY ENGINE/HEAD, 2023–2030 (UNITS)

TABLE 97 TRAIN BATTERY MARKET, BY ENGINE/HEAD, 2018–2022 (USD MILLION)

TABLE 98 TRAIN BATTERY MARKET, BY ENGINE/HEAD, 2023–2030 (USD MILLION)

8.2 DIESEL LOCOMOTIVES

8.2.1 DEVELOPMENT OF FREIGHT TRAINS AND RAIL NETWORKS IN EMERGING ECONOMIES TO DRIVE MARKET

TABLE 99 DIESEL LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 100 DIESEL LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 101 DIESEL LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 102 DIESEL LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

8.3 DIESEL MULTIPLE UNITS

8.3.1 EXPANSION OF INTERCITY RAIL NETWORKS TO DRIVE MARKET

TABLE 103 DIESEL MULTIPLE UNITS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 104 DIESEL MULTIPLE UNITS: TRAIN BATTERY MARKET, BY REGION,

2023–2030 (UNITS)

TABLE 105 DIESEL MULTIPLE UNITS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 106 DIESEL MULTIPLE UNITS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

8.4 ELECTRIC LOCOMOTIVES

8.4.1 LOW MAINTENANCE COST AND HIGHER OPERATIONAL EFFICIENCY TO DRIVE MARKET

TABLE 107 ELECTRIC LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 108 ELECTRIC LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 109 ELECTRIC LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 110 ELECTRIC LOCOMOTIVES: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

8.5 ELECTRIC MULTIPLE UNITS

8.5.1 ADVANCEMENTS IN LIGHTING SOLUTIONS, SAFETY DOORS, AND HVACS TO DRIVE MARKET

TABLE 111 ELECTRIC MULTIPLE UNITS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 112 ELECTRIC MULTIPLE UNIT: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 113 ELECTRIC MULTIPLE UNITS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 114 ELECTRIC MULTIPLE UNITS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

9 TRAIN BATTERY MARKET, BY RAILWAY APPLICATION

9.1 INTRODUCTION

9.1.1 INDUSTRY INSIGHTS

FIGURE 37 TRAIN BATTERY MARKET, BY RAILWAY APPLICATION, 2023 VS. 2030 (USD MILLION)

TABLE 115 TRAIN BATTERY MARKET, BY RAILWAY APPLICATION, 2018–2022 (UNITS)

TABLE 116 TRAIN BATTERY MARKET, BY RAILWAY APPLICATION, 2023–2030 (UNITS)

TABLE 117 TRAIN BATTERY MARKET, BY RAILWAY APPLICATION, 2018–2022

(USD MILLION)

TABLE 118 TRAIN BATTERY MARKET, BY RAILWAY APPLICATION, 2023–2030

(USD MILLION)

9.2 METROS

9.2.1 EXPANSION OF URBAN RAIL NETWORK TO DRIVE DEMAND

TABLE 119 METROS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 120 METROS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 121 METROS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 122 METROS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

9.3 HIGH-SPEED TRAINS

9.3.1 INFRASTRUCTURE DEVELOPMENT AND NEED FOR CHEAPER AND FASTER TRANSPORTATION MODES TO DRIVE DEMAND

TABLE 123 HIGH-SPEED TRAINS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 124 HIGH-SPEED TRAINS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 125 HIGH-SPEED TRAINS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 126 HIGH-SPEED TRAINS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

9.4 LIGHT RAILS/TRAMS/MONORAILS

9.4.1 RAPID URBANIZATION AND AESTHETIC VALUE TO DRIVE DEMAND

TABLE 127 LIGHT RAILS/TRAMS/MONORAILS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 128 LIGHT RAILS/TRAMS/MONORAILS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 129 LIGHT RAILS/TRAMS/MONORAILS: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 130 LIGHT RAILS/TRAMS/MONORAILS: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

9.5 PASSENGER COACHES

9.5.1 RAIL EXPANSION PROJECTS AND INCREASING NUMBER OF PASSENGERS TO DRIVE DEMAND

TABLE 131 PASSENGER COACHES: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 132 PASSENGER COACHES: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 133 PASSENGER COACHES: TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 134 PASSENGER COACHES: TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

10 TRAIN BATTERY MARKET, BY ADVANCED TRAIN TYPE

10.1 INTRODUCTION

10.1.1 INDUSTRY INSIGHTS

FIGURE 38 TRAIN BATTERY MARKET, BY ADVANCED TRAIN TYPE, 2023 VS. 2030 (USD MILLION)

TABLE 135 TRAIN BATTERY MARKET, BY ADVANCED TRAIN TYPE, 2018–2022 (UNITS)

TABLE 136 TRAIN BATTERY MARKET, BY ADVANCED TRAIN TYPE, 2023–2030 (UNITS)

TABLE 137 TRAIN BATTERY MARKET, BY ADVANCED TRAIN TYPE, 2018–2022 (USD MILLION)

TABLE 138 TRAIN BATTERY MARKET, BY ADVANCED TRAIN TYPE, 2023–2030 (USD MILLION)

10.2 HYBRID TRAINS

10.2.1 REDUCTION IN ENERGY CONSUMPTION AND REDUCED LIFECYCLE COST TO DRIVE DEMAND

10.2.2 OPERATIONAL DATA

TABLE 139 HYBRID TRAINS WITH PROPULSION TYPE

TABLE 140 HYBRID TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 141 HYBRID TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 142 HYBRID TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 143 HYBRID TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

10.3 FULLY BATTERY-OPERATED TRAINS

10.3.1 EXPANSION OF RAIL NETWORK AND HIGHER COST OF ELECTRIFICATION TO DRIVE DEMAND

TABLE 144 FULLY BATTERY-OPERATED TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 145 FULLY BATTERY-OPERATED TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 146 FULLY BATTERY-OPERATED TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 147 FULLY BATTERY-OPERATED TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

10.4 AUTONOMOUS TRAINS

10.4.1 CONTINUOUS DEVELOPMENTS, LOW COST OF OPERATION, AND LOW ENERGY CONSUMPTION TO DRIVE DEMAND

11 TRAIN BATTERY MARKET, BY REGION

11.1 INTRODUCTION

11.1.1 INDUSTRY INSIGHTS

FIGURE 39 TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

TABLE 148 TRAIN BATTERY MARKET, BY REGION, 2018–2022 (UNITS)

TABLE 149 TRAIN BATTERY MARKET, BY REGION, 2023–2030 (UNITS)

TABLE 150 TRAIN BATTERY MARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 151 TRAIN BATTERY MARKET, BY REGION, 2023–2030 (USD MILLION)

11.2 ASIA PACIFIC

11.2.1 RECESSION IMPACT

FIGURE 40 ASIA PACIFIC: TRAIN BATTERY MARKET SNAPSHOT

TABLE 152 ASIA PACIFIC: TRAIN BATTERY MARKET, BY COUNTRY, 2018–2022 (UNITS)

TABLE 153 ASIA PACIFIC: TRAIN BATTERY MARKET, BY COUNTRY, 2023–2030 (UNITS)

TABLE 154 ASIA PACIFIC: TRAIN BATTERY MARKET, BY COUNTRY, 2018–2022 (USD MILLION)

TABLE 155 ASIA PACIFIC: TRAIN BATTERY MARKET, BY COUNTRY, 2023–2030 (USD MILLION)

11.2.2 CHINA

11.2.2.1 Rail expansion projects to drive market

TABLE 156 CHINA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 157 CHINA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 158 CHINA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 159 CHINA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.2.3 INDIA

11.2.3.1 Electrification of rail routes to drive market

TABLE 160 LIST OF APPROVED UPCOMING HIGH-SPEED RAILWAY PROJECTS IN

INDIA

TABLE 161 INDIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 162 INDIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 163 INDIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 164 INDIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.2.4 JAPAN

11.2.4.1 Development of high-speed EMUs to drive market

TABLE 165 JAPAN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 166 JAPAN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 167 JAPAN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 168 JAPAN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.2.5 SOUTH KOREA

11.2.5.1 Strong urban rail network and development of high-speed rail service to drive market

TABLE 169 SOUTH KOREA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 170 SOUTH KOREA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 171 SOUTH KOREA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 172 SOUTH KOREA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3 EUROPE

11.3.1 RECESSION IMPACT

FIGURE 41 EUROPE: TRAIN BATTERY MARKET SNAPSHOT

TABLE 173 EUROPE: TRAIN BATTERY MARKET, BY COUNTRY, 2018–2022 (UNITS)

TABLE 174 EUROPE: TRAIN BATTERY MARKET, BY COUNTRY, 2023–2030 (UNITS)

TABLE 175 EUROPE: TRAIN BATTERY MARKET, BY COUNTRY, 2018–2022 (USD MILLION)

TABLE 176 EUROPE: TRAIN BATTERY MARKET, BY COUNTRY, 2023–2030 (USD MILLION)

11.3.2 GERMANY

11.3.2.1 Replacement of diesel locomotives with battery-operated trains to drive market

TABLE 177 GERMANY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 178 GERMANY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 179 GERMANY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 180 GERMANY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3.3 FRANCE

11.3.3.1 Stringent emission norms for locomotives to boost demand for train batteries

TABLE 181 FRANCE: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 182 FRANCE: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 183 FRANCE: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 184 FRANCE: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3.4 ITALY

11.3.4.1 Increasing demand for batteries for EMUs and light rails to drive market

TABLE 185 ITALY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 186 ITALY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 187 ITALY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 188 ITALY: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3.5 UK

11.3.5.1 Urban rail developments to drive market

TABLE 189 UK: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 190 UK: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 191 UK: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 192 UK: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3.6 SPAIN

11.3.6.1 Investment in high-speed rail networks to drive market

TABLE 193 SPAIN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 194 SPAIN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 195 SPAIN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 196 SPAIN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3.7 SWITZERLAND

11.3.7.1 Growing development of passenger trains to drive demand for batteries

TABLE 197 SWITZERLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 198 SWITZERLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 199 SWITZERLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 200 SWITZERLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3.8 POLAND

11.3.8.1 Development of intercity trains to drive demand for batteries

TABLE 201 POLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 202 POLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 203 POLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 204 POLAND: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.3.9 SWEDEN

11.3.9.1 Rising demand for regional trains to drive market

TABLE 205 SWEDEN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 206 SWEDEN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 207 SWEDEN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022

(USD MILLION)

TABLE 208 SWEDEN: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030

(USD MILLION)

11.4 NORTH AMERICA

11.4.1 RECESSION IMPACT

FIGURE 42 NORTH AMERICA: TRAIN BATTERY MARKET SNAPSHOT

TABLE 209 NORTH AMERICA: TRAIN BATTERY MARKET, BY COUNTRY, 2018–2022 (UNITS)

TABLE 210 NORTH AMERICA: TRAIN BATTERY MARKET, BY COUNTRY, 2023–2030 (UNITS)

TABLE 211 NORTH AMERICA: TRAIN BATTERY MARKET, BY COUNTRY, 2018–2022 (USD MILLION)

TABLE 212 NORTH AMERICA: TRAIN BATTERY MARKET, BY COUNTRY, 2023–2030 (USD MILLION)

11.4.2 US

11.4.2.1 Rising diesel prices to drive market

TABLE 213 US: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 214 US: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 215 US: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 216 US: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.4.3 CANADA

11.4.3.1 Development of commuter trains like metros and passenger rails to drive demand for batteries

TABLE 217 CANADA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 218 CANADA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 219 CANADA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 220 CANADA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

11.4.4 MEXICO

11.4.4.1 Growing development of catenary-free rail tracks to drive market

TABLE 221 MEXICO: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 222 MEXICO: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 223 MEXICO: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022
(USD MILLION)

TABLE 224 MEXICO: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030
(USD MILLION)

11.5 REST OF THE WORLD

11.5.1 RECESSION IMPACT

FIGURE 43 REST OF THE WORLD: TRAIN BATTERY MARKET, 2023 VS. 2030 (USD
MILLION)

TABLE 225 REST OF THE WORLD: TRAIN BATTERY MARKET, BY COUNTRY,
2018–2022 (UNITS)

TABLE 226 REST OF THE WORLD: TRAIN BATTERY MARKET, BY COUNTRY,
2023–2030 (UNITS)

TABLE 227 REST OF THE WORLD: TRAIN BATTERY MARKET, BY COUNTRY,
2018–2022 (USD MILLION)

TABLE 228 REST OF THE WORLD: TRAIN BATTERY MARKET, BY COUNTRY,
2023–2030 (USD MILLION)

11.5.2 BRAZIL

11.5.2.1 Growing demand for auxiliary function batteries to drive market

TABLE 229 BRAZIL: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022
(UNITS)

TABLE 230 BRAZIL: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030
(UNITS)

TABLE 231 BRAZIL: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022
(USD MILLION)

TABLE 232 BRAZIL: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030
(USD MILLION)

11.5.3 RUSSIA

11.5.3.1 Increasing demand for wide temperature-range rail batteries to drive market

TABLE 233 RUSSIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022
(UNITS)

TABLE 234 RUSSIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030
(UNITS)

TABLE 235 RUSSIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2018–2022
(USD MILLION)

TABLE 236 RUSSIA: TRAIN BATTERY MARKET, BY BATTERY TYPE, 2023–2030
(USD MILLION)

12 TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK

12.1 INTRODUCTION

12.1.1 INDUSTRY INSIGHTS

FIGURE 44 TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK, 2023 VS. 2030 (USD MILLION)

TABLE 237 TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK, 2018–2022 (UNITS)

TABLE 238 TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK, 2023–2030 (UNITS)

TABLE 239 TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK, 2018–2022 (USD MILLION)

TABLE 240 TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK, 2023–2030 (USD MILLION)

12.2 LOCOMOTIVES

12.2.1 IMPROVED LIFE CYCLE OF LOCOMOTIVES TO DRIVE DEMAND FOR TRAIN BATTERIES

TABLE 241 LOCOMOTIVES: TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 242 LOCOMOTIVES: TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 243 LOCOMOTIVES: TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 244 LOCOMOTIVES: TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (USD MILLION)

12.3 MULTIPLE UNITS

12.3.1 ADVANCED FEATURES IN URBAN TRANSIT SYSTEMS TO INCREASE TRAIN BATTERY ADOPTION IN MULTIPLE UNITS

TABLE 245 MULTIPLE UNITS: TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 246 MULTIPLE UNITS: TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 247 MULTIPLE UNITS: TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 248 MULTIPLE UNITS: TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (USD MILLION)

12.4 PASSENGER COACHES

12.4.1 REFURBISHMENT PROJECTS TO EXTEND OPERATIONAL LIFE OF PASSENGER COACHES TO BOOST DEMAND

TABLE 249 PASSENGER COACHES: TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 250 PASSENGER COACHES: TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 251 PASSENGER COACHES: TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 252 PASSENGER COACHES: TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (USD MILLION)

13 TRAIN BATTERY AFTERMARKET, BY BATTERY TYPE

13.1 INTRODUCTION

13.1.1 INDUSTRY INSIGHTS

FIGURE 45 TRAIN BATTERY AFTERMARKET, BY BATTERY TYPE, 2023 VS. 2030 (USD MILLION)

TABLE 253 TRAIN BATTERY AFTERMARKET, BY BATTERY TYPE, 2018–2022 (UNITS)

TABLE 254 TRAIN BATTERY AFTERMARKET, BY BATTERY TYPE, 2023–2030 (UNITS)

TABLE 255 TRAIN BATTERY AFTERMARKET, BY BATTERY TYPE, 2018–2022 (USD MILLION)

TABLE 256 TRAIN BATTERY AFTERMARKET, BY BATTERY TYPE, 2023–2030 (USD MILLION)

13.2 LEAD-ACID BATTERIES

13.2.1 FREQUENT REPLACEMENT RATE AND LOW CYCLE LIFE TO DRIVE DEMAND

TABLE 257 LEAD-ACID BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 258 LEAD-ACID BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 259 LEAD-ACID BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 260 LEAD-ACID BATTERY AFTERMARKET, BY REGION, 2023–2030 (USD MILLION)

13.3 NICKEL-CADMIUM BATTERIES

13.3.1 LONGER LIFE AND EASY MAINTENANCE TO BOOST MARKET SHARE

TABLE 261 NICKEL-CADMIUM BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 262 NICKEL-CADMIUM BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 263 NICKEL-CADMIUM BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 264 NICKEL-CADMIUM BATTERY AFTERMARKET, BY REGION, 2023–2030

(USD MILLION)

14 TRAIN BATTERY AFTERMARKET, BY APPLICATION

14.1 INTRODUCTION

14.1.1 INDUSTRY INSIGHTS

FIGURE 46 TRAIN BATTERY AFTERMARKET, BY APPLICATION, 2023 VS. 2030
(USD MILLION)

TABLE 265 TRAIN BATTERY AFTERMARKET, BY APPLICATION, 2018–2022
(UNITS)

TABLE 266 TRAIN BATTERY AFTERMARKET, BY APPLICATION, 2023–2030
(UNITS)

TABLE 267 TRAIN BATTERY AFTERMARKET, BY APPLICATION, 2018–2022 (USD
MILLION)

TABLE 268 TRAIN BATTERY AFTERMARKET, BY APPLICATION, 2023–2030 (USD
MILLION)

14.2 STARTER BATTERIES

14.2.1 REQUIREMENT FOR REPLACEMENT BATTERIES IN DMUS AND DIESEL
LOCOMOTIVES TO DRIVE DEMAND

TABLE 269 STARTER BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 270 STARTER BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 271 STARTER BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD
MILLION)

TABLE 272 STARTER BATTERY AFTERMARKET, BY REGION, 2023–2030 (USD
MILLION)

14.3 AUXILIARY BATTERIES

14.3.1 GROWING POWER REQUIREMENT FOR ONBOARD ELECTRIC SYSTEMS
TO RAISE DEMAND

TABLE 273 AUXILIARY BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 274 AUXILIARY BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 275 AUXILIARY BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD
MILLION)

TABLE 276 AUXILIARY BATTERY AFTERMARKET, BY REGION, 2023–2030 (USD
MILLION)

15 TRAIN BATTERY AFTERMARKET, BY REGION

15.1 INTRODUCTION

15.1.1 INDUSTRY INSIGHTS

FIGURE 47 TRAIN BATTERY AFTERMARKET, BY REGION, 2023 VS. 2030 (USD MILLION)

TABLE 277 TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (UNITS)

TABLE 278 TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (UNITS)

TABLE 279 TRAIN BATTERY AFTERMARKET, BY REGION, 2018–2022 (USD MILLION)

TABLE 280 TRAIN BATTERY AFTERMARKET, BY REGION, 2023–2030 (USD MILLION)

15.2 ASIA PACIFIC

15.2.1 HIGH NUMBER OF ROLLING STOCKS TO DRIVE REPLACEMENT DEMAND

15.3 EUROPE

15.3.1 EXPANSION OF INTERCITY RAIL NETWORKS TO DRIVE DEMAND

15.4 NORTH AMERICA

15.4.1 GROWING DIESEL LOCOMOTIVE RETROFITTING AND REFURBISHMENT TO DRIVE DEMAND

16 COMPETITIVE LANDSCAPE

16.1 OVERVIEW

16.2 MARKET SHARE ANALYSIS, 2022

TABLE 281 TRAIN BATTERY MARKET SHARE ANALYSIS, 2022

16.3 TRAIN BATTERY MARKET SHARE ANALYSIS, 2022

FIGURE 48 TRAIN BATTERY MARKET SHARE ANALYSIS, 2022

16.4 REVENUE ANALYSIS OF TOP LISTED/PUBLIC PLAYERS

FIGURE 49 REVENUE ANALYSIS OF TOP 5 MARKET PLAYERS, 2020–2022

16.5 COMPANY EVALUATION MATRIX

16.5.1 STARS

16.5.2 EMERGING LEADERS

16.5.3 PERVASIVE PLAYERS

16.5.4 PARTICIPANTS

FIGURE 50 COMPANY EVALUATION MATRIX: TRAIN BATTERY MANUFACTURERS, 2022

16.5.5 COMPANY FOOTPRINT

TABLE 282 TRAIN BATTERY MARKET: COMPANY PRODUCT FOOTPRINT, 2022

TABLE 283 TRAIN BATTERY MARKET: COMPANY APPLICATION FOOTPRINT, 2022

TABLE 284 TRAIN BATTERY MARKET: COMPANY REGION FOOTPRINT, 2022

16.6 COMPANY EVALUATION MATRIX – BATTERY MANUFACTURERS FOR FULLY BATTERY-OPERATED TRAINS

16.6.1 STARS

16.6.2 EMERGING LEADERS

16.6.3 PERVASIVE PLAYERS

16.6.4 PARTICIPANTS

FIGURE 51 COMPANY EVALUATION MATRIX: BATTERY MANUFACTURERS FOR FULLY BATTERY-OPERATED TRAINS, 2022

16.6.5 COMPANY FOOTPRINT

TABLE 285 COMPANY PRODUCT FOOTPRINT, 2022

TABLE 286 COMPANY APPLICATION FOOTPRINT, 2022

TABLE 287 COMPANY REGION FOOTPRINT, 2022

16.7 COMPETITIVE SCENARIO

16.7.1 PRODUCT LAUNCHES

TABLE 288 PRODUCT LAUNCHES, 2018–2023

16.7.2 DEALS

TABLE 289 DEALS, 2018–2023

16.7.3 OTHERS

TABLE 290 OTHERS, 2018–2023

16.8 KEY PLAYER STRATEGIES/RIGHT TO WIN, 2018–2022

TABLE 291 COMPANIES ADOPTED PRODUCT DEVELOPMENTS AND EXPANSIONS AS KEY GROWTH STRATEGIES, 2018–2022

16.9 MAJOR BATTERY SUPPLIERS – CURRENT PRODUCT OFFERINGS AND FUTURE PRODUCT PLANS

TABLE 292 CURRENT VS. FUTURE PRODUCT PLANS

17 COMPANY PROFILES

17.1 KEY PLAYERS

(Business Overview, Products/Services/Solutions Offered, MnM View, Key Strengths and Right to Win, Strategic Choices Made, Weaknesses and Competitive Threats, Recent Developments)*

17.1.1 ENERSYS

TABLE 293 ENERSYS: COMPANY OVERVIEW

FIGURE 52 ENERSYS: COMPANY SNAPSHOT

TABLE 294 ENERSYS: PRODUCT LAUNCHES

TABLE 295 ENERSYS: DEALS

17.1.2 SAFT

TABLE 296 SAFT: COMPANY OVERVIEW

TABLE 297 SAFT: DEALS

TABLE 298 SAFT: OTHERS

17.1.3 GS YUASA INTERNATIONAL LTD.

TABLE 299 GS YUASA INTERNATIONAL LTD.: COMPANY OVERVIEW

FIGURE 53 GS YUASA INTERNATIONAL LTD.: COMPANY SNAPSHOT

TABLE 300 GS YUASA INTERNATIONAL LTD.: PRODUCT LAUNCHES

TABLE 301 GS YUASA INTERNATIONAL LTD.: OTHERS

17.1.4 EXIDE INDUSTRIES LTD.

TABLE 302 EXIDE INDUSTRIES LTD.: COMPANY OVERVIEW

FIGURE 54 EXIDE INDUSTRIES LTD.: COMPANY SNAPSHOT

TABLE 303 EXIDE INDUSTRIES LTD.: DEALS

TABLE 304 EXIDE INDUSTRIES LTD.: OTHERS

17.1.5 AMARA RAJA BATTERIES LIMITED

TABLE 305 AMARA RAJA BATTERIES LIMITED: COMPANY OVERVIEW

FIGURE 55 AMARA RAJA BATTERIES LIMITED: COMPANY SNAPSHOT

TABLE 306 AMARA RAJA BATTERIES LIMITED: DEALS

TABLE 307 AMARA RAJA BATTERIES LIMITED: OTHERS

17.1.6 HOPPECKE BATTERIEN GMBH & CO. KG

TABLE 308 HOPPECKE BATTERIEN GMBH & CO. KG: COMPANY OVERVIEW

TABLE 309 HOPPECKE BATTERIEN GMBH & CO. KG: DEALS

TABLE 310 HOPPECKE BATTERIEN GMBH & CO. KG: OTHERS

17.1.7 SEC BATTERY

TABLE 311 SEC BATTERY: COMPANY OVERVIEW

17.1.8 FIRST NATIONAL BATTERY

TABLE 312 FIRST NATIONAL BATTERY: COMPANY OVERVIEW

17.1.9 POWER & INDUSTRIAL BATTERY SYSTEMS GMBH

TABLE 313 POWER & INDUSTRIAL BATTERY SYSTEMS GMBH: COMPANY OVERVIEW

17.1.10 EXIDE TECHNOLOGIES

TABLE 314 EXIDE TECHNOLOGIES: COMPANY OVERVIEW

17.1.11 TOSHIBA CORPORATION

TABLE 315 TOSHIBA CORPORATION: COMPANY OVERVIEW

FIGURE 56 TOSHIBA CORPORATION: COMPANY SNAPSHOT

TABLE 316 TOSHIBA CORPORATION: PRODUCT LAUNCHES

TABLE 317 TOSHIBA CORPORATION: DEALS

TABLE 318 TOSHIBA CORPORATION: OTHERS

*Business Overview, Products/Services/Solutions Offered, MnM View, Key Strengths and Right to Win, Strategic Choices Made, Weaknesses and Competitive Threats, Recent Developments might not be captured in case of unlisted companies.

17.2 OTHER PLAYERS

17.2.1 EAST PENN MANUFACTURING COMPANY

TABLE 319 EAST PENN MANUFACTURING COMPANY: COMPANY OVERVIEW

17.2.2 MICROTEx ENERGY PRIVATE LIMITED

TABLE 320 MICROTEx ENERGY PRIVATE LIMITED: COMPANY OVERVIEW

17.2.3 AEG POWER SOLUTIONS

TABLE 321 AEG POWER SOLUTIONS: COMPANY OVERVIEW

17.2.4 FURUKAWA ELECTRIC CO., LTD.

TABLE 322 FURUKAWA ELECTRIC CO., LTD.: COMPANY OVERVIEW

17.2.5 HUNAN FENGRI POWER & ELECTRIC CO., LTD.

TABLE 323 HUNAN FENGRI POWER & ELECTRIC CO., LTD.: COMPANY OVERVIEW

17.2.6 SHUANGDENG GROUP CO., LTD.

TABLE 324 SHUANGDENG GROUP CO., LTD.: COMPANY OVERVIEW

17.2.7 COSLIGHT INDIA

TABLE 325 COSLIGHT INDIA: COMPANY OVERVIEW

17.2.8 SHIELD BATTERIES LIMITED

TABLE 326 SHIELD BATTERIES LIMITED: COMPANY OVERVIEW

17.2.9 AKASOL AG

TABLE 327 AKASOL AG: COMPANY OVERVIEW

17.2.10 DMS TECHNOLOGIES

TABLE 328 DMS TECHNOLOGIES: COMPANY OVERVIEW

17.2.11 NATIONAL RAILWAY SUPPLY

TABLE 329 NATIONAL RAILWAY SUPPLY: COMPANY OVERVIEW

17.2.12 LECLANCH? SA

TABLE 330 LECLANCH? SA: COMPANY OVERVIEW

17.2.13 ECOBAT

TABLE 331 ECOBAT: COMPANY OVERVIEW

17.2.14 HBL BATTERIES

TABLE 332 HBL BATTERIES: COMPANY OVERVIEW

17.2.15 STAR BATTERY LTD.

TABLE 333 STAR BATTERY LTD.: COMPANY OVERVIEW

17.2.16 HITACHI, LTD.

TABLE 334 HITACHI, LTD.: COMPANY OVERVIEW

18 RECOMMENDATIONS FROM MARKETSandMARKETS

18.1 ASIA PACIFIC: POTENTIAL MARKET FOR TRAIN BATTERY MANUFACTURERS TO FOCUS ON

18.2 COST-EFFECTIVE BATTERY TECHNOLOGIES WITH HIGH ENERGY DENSITY: NEED OF FUTURE

18.3 CONCLUSION

19 APPENDIX

19.1 INSIGHTS FROM INDUSTRY EXPERTS

19.2 DISCUSSION GUIDE

19.3 KNOWLEDGESTORE: MARKETSandMARKETS' SUBSCRIPTION PORTAL

19.4 CUSTOMIZATION OPTIONS

19.4.1 TRAIN BATTERY MARKET, BY APPLICATION AND ROLLING STOCK

19.4.1.1 Engine Starters

19.4.1.2 Auxiliary Functions

19.4.2 TRAIN BATTERY MARKET, BY ROLLING STOCK AND BY BATTERY TYPE

19.4.2.1 Lead-acid

19.4.2.2 Nickel-Cadmium

19.4.2.3 Lithium-ion

19.4.3 US TRAIN BATTERY AFTERMARKET, BY ROLLING STOCK

19.4.3.1 Locomotives

19.4.3.2 Multiple Units

19.4.3.3 Passenger Coaches

19.5 RELATED REPORTS

19.6 AUTHOR DETAILS

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