

Electric Construction Equipment Market by Equipment Type, Battery Capacity, Battery Type, Power Output, Application, Propulsion, Electric Tractor Market, Electric Construction & Mining Equipment Market and Region - Global Forecast to 2027

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Report description:

The electric off-highway equipment market is estimated to grow from USD 9.2 billion in 2022 to USD 24.8 billion by 2027 at a CAGR of 22.0% over the forecast period. All key countries have established programs/regulations to deal with GHG emissions in the transportation industry. Most countries follow Euro equivalent Standards, such as Stage IV or V. The PM limit of the Stage V standard is 97% lower than that of the Stage I Standard, and the hydrocarbon (HC) + Nitrogen Oxides (NOx) limit is 94% lower. China, Japan, South Korea, and India also follow the Euro Equivalent regulations. The Emission Control Technologies (ECT) such as Selective Catalytic Reduction (SCR), Gasoline Particulate Filter (GPF), Exhaust Gas Recirculation (EGR), Diesel Particulate Filter (DPF), various sensors including oxygen sensor, NOx sensors, and thermal management technologies - are used to control and reduce the emissions from the off-highway equipment. Some ECTs also lead to loss of power and other downfalls such as reduced fuel economy, reduced back pressure in prolonged use, more maintenance activities, etc. All these expenses, including the vehicle's increased capital, resulted in the customers' extended return on investment (ROI) duration.

To overcome these difficulties and the associated costs, the manufacturers and customers opt for an alternative sustainable mode of mobility. This greatly aided the development of the hybrid and electric off-highway equipment and equipment, which are more efficient, emission-free, and noise-free than their IC engine counterparts.

Moreover, the initial cost of electric off-highway equipment is around 140%-170% higher than conventional equipment because of the high cost of the batteries. However, with advancements in battery technology, the cost of the battery and overall equipment is expected to decrease. Due to the high cost of electric equipment, the demand is expected to be steady in the near future; the market would showcase a promising growth in the long run. In the near future, OEMs are expected to prefer hybrid or alternate fuel engines to balance the equipment's limits and cost.

The underground mining activities produce harmful dust and gases and usually have a hot to very hot temperature. The

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diesel-powered mining vehicles and equipment are one of the major producers of the underground mines' heat, nitrogen dioxide, and other toxic gases. These emissions also increase the heat generated in underground mines, which demands a crucial ventilation system with huge capital maintenance expenses. According to the International Council on Mining and Metals (ICMM), 40% of an underground mine's energy outlay is spent on operating ventilation systems to remove pollutants and heat from mining tunnels. Such factors increase the overall operational cost of the mine while decreasing its production efficiency.

The regulations also mandate that the air reaching each mine's working faces must travel with a velocity to cover at least 60 feet in a minute. These air velocities are controlled by various ventilation systems and balance the airflow with the correct ratio. The diesel engine vehicles not only produce emissions and heat but also produce high sounds within the narrow mining channels. For these reasons and to achieve sustainability goals, manufacturers and mine owners have started to prefer the electrification of these mining vehicles. Especially in designing a new mining site, incorporating an electric fleet of vehicles and equipment can drastically reduce capital and maintenance costs. Though the ventilation system cannot be eliminated, the electric mining vehicles reduce the system's load as it produces zero emissions and less heat. In such cases, the capacity of the ventilation systems can be reduced, thereby reducing the capital investment.

Therefore, the miners find the electric mining vehicles more profitable and apt for their large underground mining operations. Moreover, many leading miners, including Anglo American (AAL.L), Rio Tinto (RIO.L), and BHP (BHPB.L), have already committed to net zero emissions by the year 2050, and these companies prefer the electric mining fleet to reach their sustainability goals. "The battery electric off-highway equipment would lead the market due to the stringent noise and emission regulations."

The demand for sustainable equipment in the mining industry to decrease ventilation costs is expected to drive the electrification of mining equipment during the forecast period. However, the stringent noise and emission regulations within the city limits would drive the market for such battery electric and hybrid construction equipment. Though these electric equipment would face challenges such as higher cost than their ICE counterparts or longer charging time, the advancements in the battery technology would make the electric equipment popular in the long run.

Americas is projected to be the second largest market for electric off-highway equipment

The leading countries such as US, Canada, Mexico, Brazil, and Argentina are considered under the Americas region. The electric off-highway equipment demand in Americas is rapidly increasing because of the environmental protection measures adopted in these key countries. In addition, with the upcoming stringent emission norms for fuel economy in the region, companies are making efforts to manufacture electric and hybrid equipment for the domestic market. Recent electric equipment launches from the leading off-highway equipment manufacturers has promised the growth of electric off-highway equipment market in this region. Some of the leading companies that are present in this region are Caterpillar Inc. (US), Deere & Company (US), Soletac Inc. (US), Dana Limited (US) and others.

Moreover, the region has large deposits of coal, iron, zinc, copper, cement, lithium, and precious metals. The mining industry in this region is large and many leading players that hold a significant share of the mining equipment market are present in this region. The Americas electric off-highway equipment market is estimated to be the second largest market, globally. High demand for mini construction equipment, including mini excavators, loaders, and dozers, is driving the growth of the electric off-highway equipment market in Americas.

The US is projected to dominate the Americas electric off-highway equipment market with a value of USD 6,793.0 Million by 2027. This is mainly because of increasing demand for electrification in construction, mining, and agriculture vehicles, because of its various advantages including emission free and noiseless operation. The presence of major electric off-highway equipment manufacturers in US and their increasing investments in electric off-highway equipment, subsystems, and battery developments are some other key reasons for the growth of electric off-highway equipment market in US.

For instance, in 2021, The Caterpillar Inc. along with another venture, invested USD 16 Million as Series B funding for BrightVolt, Inc, a global leader in the design, development, and manufacturing of safe, high energy and low-cost solid-state lithium-ion batteries. This funding is aimed to be used for the development of larger form factor products aiming industrial electrification and e-mobility markets.

Such developments of the leading companies with the aim to minimize drawbacks of the conventional battery types in electric loaders and excavators are further expected to drive the growth for the electric off-highway equipment in the US.

In-depth interviews were conducted with CEOs, marketing directors, other innovation and strategy directors, and executives from

various key organizations operating in this market.

-By Company Type: Electric off-highway equipment OEM - 40%, Tier 1 - 20%, Tier 2 - 40%

-By Designation: C Level - 30%, Directors- 20%, and Others - 50%

-By Region: Asia Pacific - 50%, Europe - 20%, North America -30% RoW - 10%

The electric off-highway equipment market is dominated by a few globally established companies such as Hitachi Construction Machinery (Japan), Caterpillar Inc. (US), Komatsu Ltd. (Japan), JCB (UK), Volvo Construction Equipment (Volvo CE) (Sweden).

Research Coverage:

The study segments the electric off-highway equipment market and forecasts the market size based on equipment type (electric excavator, electric motor grader, electric dozer, electric loader, electric dump truck, electric load-haul-dump loader, electric lawnmower, electric sprayer, and electric tractor), battery capacity (<50 kWh, 50-200 kWh, 200-500 kWh, and >500 kWh), battery type (lithium-ion, lead-acid, and other batteries), power output (<50 hp, 50-150 hp, 150-300 hp, and >300 hp), application (construction, mining, agriculture, and gardening), propulsion (hybrid-electric and battery-electric), Electric tractor market, by propulsion type (hybrid electric & battery electric), Electric construction & mining equipment market, by propulsion type (hybrid electric & battery electric), and region (Asia-Pacific, Europe, and Americas)

The study also includes an in-depth competitive analysis of the major electric off-highway equipment manufacturers in the market, along with their company profiles, key observations related to product and business offerings, recent developments, and key market strategies.

Key Benefits of Buying the Report:

The report will help the market leaders/new entrants in this market with the information on the closest approximations of the revenue numbers for the overall electric off-highway equipment market and the sub-segments. This report will help stakeholders understand the competitive landscape and gain more insights to better position their businesses and plan suitable go-to-market strategies. The report also helps stakeholders understand the market's pulse and provides them information on key market drivers, restraints, challenges, and opportunities.

Table of Contents:

1 INTRODUCTION 42

1.1 STUDY OBJECTIVES 42

1.2 MARKET DEFINITION 43

1.3 INCLUSIONS & EXCLUSIONS 43

TABLE 1 INCLUSIONS & EXCLUSIONS FOR ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET 43

1.4 STUDY SCOPE 44

1.4.1 MARKETS COVERED 44

FIGURE 1 MARKET SEGMENTATION: ELECTRIC CONSTRUCTION EQUIPMENT MARKET 44

1.4.2 YEARS CONSIDERED 45

1.5 CURRENCY CONSIDERED 45

1.6 PACKAGE SIZE 45

1.7 LIMITATIONS 45

1.8 STAKEHOLDERS 46

1.9 SUMMARY OF CHANGES 46

2 RESEARCH METHODOLOGY 48

2.1 RESEARCH DATA 48

FIGURE 2 RESEARCH DESIGN 49

FIGURE 3 RESEARCH METHODOLOGY MODEL 50

2.2 SECONDARY DATA 50

2.2.1 LIST OF KEY SECONDARY SOURCES TO ESTIMATE ELECTRIC OFF-HIGHWAY EQUIPMENT SALES 51

2.2.2 LIST OF KEY SECONDARY SOURCES TO ESTIMATE ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET SIZE 52

2.2.3 KEY DATA FROM SECONDARY SOURCES 52

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2.3	PRIMARY DATA	53
FIGURE 4	BREAKDOWN OF PRIMARY INTERVIEWS	53
2.3.1	SAMPLING TECHNIQUES & DATA COLLECTION METHODS	53
2.3.1.1	Primary participants	54
2.4	MARKET SIZE ESTIMATION	54
FIGURE 5	RESEARCH METHODOLOGY: HYPOTHESIS BUILDING	54
2.4.1	BOTTOM-UP APPROACH	55
FIGURE 6	BOTTOM-UP APPROACH: ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET	55
2.4.2	TOP-DOWN APPROACH	56
FIGURE 7	TOP-DOWN APPROACH: ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET	56
2.5	FACTOR ANALYSIS	57
2.6	MARKET BREAKDOWN AND DATA TRIANGULATION	58
FIGURE 8	DATA TRIANGULATION	58
2.7	ASSUMPTIONS	59
2.8	RESEARCH LIMITATIONS	61
3	EXECUTIVE SUMMARY	62
3.1	REPORT SUMMARY	62
FIGURE 9	ELECTRIC CONSTRUCTION EQUIPMENT MARKET OUTLOOK	62
FIGURE 10	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022 & 2027 (USD MILLION)	63
4	PREMIUM INSIGHTS	64
4.1	ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN ELECTRIC CONSTRUCTION EQUIPMENT MARKET	64
FIGURE 11	GROWING NEED TO MINIMIZE EMISSIONS AND VENTILATION COSTS IN UNDERGROUND MINING TO DRIVE MARKET	64
4.2	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE	65
FIGURE 12	DUMP TRUCK SEGMENT TO LEAD ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET FROM 2022 TO 2027	65
4.3	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY APPLICATION	65
FIGURE 13	ELECTRIC MINING EQUIPMENT WOULD SHOWCASE LARGEST DEMAND OVER FORECAST PERIOD	65
4.4	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY TYPE	66
FIGURE 14	LITHIUM-ION WOULD BE MOST PREFERRED BATTERY TYPE IN ELECTRIC OFF-HIGHWAY EQUIPMENT DURING FORECAST PERIOD	66
4.5	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY CAPACITY	66
FIGURE 15	<50 KWH SEGMENT ESTIMATED TO LEAD ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET IN 2022	66
4.6	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY PROPULSION	67
FIGURE 16	BATTERY-ELECTRIC EQUIPMENT WOULD BE PREFERRED OVER HYBRID-ELECTRIC EQUIPMENT DURING FORECAST PERIOD	67
4.7	ELECTRIC TRACTOR MARKET, BY PROPULSION	67
FIGURE 17	BATTERY-ELECTRIC TRACTORS WOULD BE PREFERRED OVER HYBRID-ELECTRIC TRACTORS OVER FORECAST PERIOD	67
4.8	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY POWER OUTPUT	68
FIGURE 18	<50 HP SEGMENT ESTIMATED TO LEAD ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET IN 2022	68
4.9	ELECTRIC CONSTRUCTION AND MINING EQUIPMENT MARKET, BY PROPULSION	68
FIGURE 19	HYBRID-ELECTRIC SEGMENT PROJECTED TO REGISTER HIGHER CAGR DURING FORECAST PERIOD	68
4.10	ELECTRIC AGRICULTURAL EQUIPMENT MARKET, BY EQUIPMENT TYPE	69
FIGURE 20	ELECTRIC LAWN MOWER SEGMENT TO LEAD ELECTRIC OFF-HIGHWAY MARKET DURING FORECAST PERIOD	69
4.11	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION	69
FIGURE 21	AMERICAS ESTIMATED TO ACCOUNT FOR LARGEST MARKET SHARE IN 2022	69
5	MARKET OVERVIEW	70
5.1	INTRODUCTION	70
5.2	MARKET DYNAMICS	71

FIGURE 22 ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET: MARKET DYNAMICS 71

5.2.1 DRIVERS 71

5.2.1.1 Strict vehicular emission regulations 71

FIGURE 23 NON-ROAD MOBILE MACHINERY (NRMM) EMISSION REGULATION OUTLOOK, 2019-2030 72

TABLE 2 COMPARISON BETWEEN BHARAT STAGE IV AND BHARAT STAGE V REGULATIONS FOR PM LIMITS 72

TABLE 3 COMPARISON BETWEEN BHARAT STAGE IV AND BHARAT STAGE V REGULATIONS FOR PN LIMITS 73

TABLE 4 COMPARISON BETWEEN EURO STAGE IV, V, AND VI REGULATIONS FOR HEAVY-DUTY DIESEL ENGINES, IN G/KWH 73

5.2.1.2 High ventilation costs in underground mining 74

TABLE 5 AIR QUANTITY COMPARISON BETWEEN LIGNITE AND ANTHRACITE MINES 74

TABLE 6 COST COMPARISON BETWEEN DIESEL AND ELECTRIC MINING EQUIPMENT 75

5.2.1.3 Rising demand for low-noise construction activities in residential areas 75

TABLE 7 CONSTRUCTION EQUIPMENT NOISE EMISSION LEVELS FOR RESIDENTIAL AREAS, BY COUNTRY 75

TABLE 8 LOW NOISE ELECTRIC CONSTRUCTION EQUIPMENT BY KEY OEMS 76

5.2.2 RESTRAINTS 77

5.2.2.1 Higher initial cost than conventional ICE equipment 77

TABLE 9 COST COMPARISON: ELECTRIC VS DIESEL POWERED OFF-HIGHWAY EQUIPMENT, BY OEM 77

5.2.3 OPPORTUNITIES 78

5.2.3.1 Development of long-range and fast-charging battery technology 78

5.2.3.2 Intermediate demand for hybrid and alternate fuel equipment 79

5.2.4 CHALLENGES 79

5.2.4.1 Limited compatibility, interchangeability, and standardization of electric off-highway equipment for long-haul applications 79

TABLE 10 RANGE COMPARISON: OFF-HIGHWAY DIESEL TRUCK VS BATTERY ELECTRIC TRUCK 80

5.2.4.2 Need for efficient thermal management system for batteries in extreme working conditions 80

TABLE 11 WORKING TEMPERATURE COMPARISON FOR OFF-HIGHWAY EQUIPMENT 80

5.3 PORTER'S FIVE FORCES ANALYSIS 81

TABLE 12 PORTER'S FIVE FORCES ANALYSIS 81

FIGURE 24 PORTER'S FIVE FORCES ANALYSIS 82

5.3.1 THREAT OF NEW ENTRANTS 82

5.3.2 THREAT OF SUBSTITUTES 83

5.3.3 BARGAINING POWER OF SUPPLIERS 83

5.3.4 BARGAINING POWER OF BUYERS 83

5.3.5 INTENSITY OF COMPETITIVE RIVALRY 83

5.4 TRADE ANALYSIS 84

5.4.1 IMPORT TRADE DATA 84

TABLE 13 MECHANICAL SHOVELS, EXCAVATORS, AND SHOVEL LOADERS - IMPORT TRADE DATA, BY KEY COUNTRIES, 2021 (USD) 84

TABLE 14 BULLDOZERS AND ANGLEDZERS - IMPORT TRADE DATA, BY KEY COUNTRIES, 2021 (USD) 84

5.4.2 EXPORT TRADE DATA 85

TABLE 15 MECHANICAL SHOVELS, EXCAVATORS, AND SHOVEL LOADERS - EXPORT TRADE DATA, BY KEY COUNTRIES, 2021 (USD) 85

TABLE 16 BULLDOZERS AND ANGLEDZERS - EXPORT TRADE DATA, BY KEY COUNTRIES, 2021 (USD) 85

5.5 ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET: TRENDS AND DISRUPTIONS IMPACTING CUSTOMERS 86

FIGURE 25 REVENUE SHIFT FOR ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET 86

5.6 CASE STUDIES 86

5.6.1 XINGWANXIANG GROUP'S ADAPTION OF ELECTRIC MINING EQUIPMENT IN MINUS 30 DEGREE TEMPERATURE 86

5.6.2 FIRST MODE'S SUSTAINABLE SOLUTION TO ANGLO AMERICAN'S CARBON NEUTRAL COMMITMENT 87

5.6.3 BERLINER STADTREINIGUNGSBETRIEBE (BSR) MANAGES CITY WASTE USING ELECTRIC MOBILITY 87

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5.6.4	BRUCEJACK GETS ITS FULLY ELECTRIC FLEET	87
5.6.5	ELECTRIFICATION OF CONVENTIONAL DIESEL-POWERED EXCAVATOR	88
5.7	PATENT ANALYSIS	88
5.8	SUPPLY CHAIN ANALYSIS	92
FIGURE 26	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET: SUPPLY CHAIN ANALYSIS	92
5.9	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET ECOSYSTEM	93
FIGURE 27	ELECTRIC CONSTRUCTION EQUIPMENT MARKET: ECOSYSTEM	93
TABLE 17	ROLE OF COMPANIES IN ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET ECOSYSTEM	94
5.10	REGULATORY ANALYSIS	95
5.10.1	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET: QUALITY STANDARDS	95
TABLE 18	REGULATIONS/STANDARDS FOR ELECTRIC CONSTRUCTION EQUIPMENT	96
5.11	PRICING ANALYSIS	97
5.11.1	ASP ANALYSIS, BY APPLICATION & REGION, 2021	97
TABLE 19	ASP ANALYSIS, BY APPLICATION & REGION, 2021	97
5.11.2	ASP ANALYSIS, BY EQUIPMENT TYPE & REGION, 2021	98
TABLE 20	ASP ANALYSIS, BY EQUIPMENT TYPE & REGION, 2021	98
5.12	TECHNOLOGY ANALYSIS	98
5.12.1	OVERVIEW	98
5.12.1.1	Autonomous construction equipment	99
5.12.1.2	Monitoring and diagnosis via connected technologies	99
5.12.1.3	Safer braking in deep mining sites with regenerative braking	99
5.12.1.4	Agricultural Equipment Automation	99
5.13	KEY CONFERENCES AND EVENTS IN 2022-2023	100
5.14	KEY STAKEHOLDERS & BUYING CRITERIA	101
5.14.1	KEY STAKEHOLDERS IN BUYING PROCESS	101
FIGURE 28	INFLUENCE OF STAKEHOLDERS IN BUYING PROCESS, BY APPLICATION	101
TABLE 21	INFLUENCE OF STAKEHOLDERS IN BUYING PROCESS FOR TOP THREE APPLICATIONS (%)	102
5.14.2	BUYING CRITERIA	102
FIGURE 29	KEY BUYING CRITERIA FOR TOP THREE ELECTRIC CONSTRUCTION EQUIPMENT APPLICATIONS	102
TABLE 22	KEY BUYING CRITERIA FOR TOP THREE ELECTRIC CONSTRUCTION EQUIPMENT APPLICATIONS	103
6	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE	104
6.1	INTRODUCTION	105
6.1.1	RESEARCH METHODOLOGY	105
6.1.2	ASSUMPTIONS	105
6.1.3	INDUSTRY INSIGHTS	105
FIGURE 30	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022 VS. 2027 (USD MILLION)	106
TABLE 23	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (UNITS)	106
TABLE 24	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (UNITS)	106
TABLE 25	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (USD MILLION)	107
TABLE 26	ELECTRIC CONSTRUCTION MARKET, BY EQUIPMENT TYPE, 2022-2027 (USD MILLION)	107
6.2	ELECTRIC EXCAVATOR	108
6.2.1	ELECTRIC MINI EXCAVATORS HOLD MAXIMUM SHARE IN ELECTRIC EXCAVATOR SEGMENT	108
TABLE 27	ELECTRIC EXCAVATOR MARKET, BY REGION, 2018-2021 (UNITS)	108
TABLE 28	ELECTRIC EXCAVATOR MARKET, BY REGION, 2022-2027 (UNITS)	108
TABLE 29	ELECTRIC EXCAVATOR MARKET, BY REGION, 2018-2021 (USD MILLION)	109
TABLE 30	ELECTRIC EXCAVATOR MARKET, BY REGION, 2022-2027 (USD MILLION)	109
6.3	ELECTRIC LOADER	109

6.3.1	INCREASING DEMAND FOR COMPACT ELECTRIC LOADERS AND SKID STEER LOADERS GLOBALLY	109
TABLE 31	ELECTRIC LOADER MARKET, BY REGION, 2018-2021 (UNITS)	110
TABLE 32	ELECTRIC LOADER MARKET, BY REGION, 2022-2027 (UNITS)	110
TABLE 33	ELECTRIC LOADER MARKET, BY REGION, 2018-2021 (USD MILLION)	110
TABLE 34	ELECTRIC LOADER MARKET, BY REGION, 2022-2027 (USD MILLION)	110
6.4	ELECTRIC MOTOR GRADER	111
6.4.1	ELECTRIFICATION OF MOTOR GRADERS STILL IN NASCENT STAGE	111
TABLE 35	ELECTRIC MOTOR GRADER MARKET, BY REGION, 2018-2021 (UNITS)	111
TABLE 36	ELECTRIC MOTOR GRADER MARKET, BY REGION, 2022-2027 (UNITS)	111
TABLE 37	ELECTRIC MOTOR GRADER MARKET, BY REGION, 2018-2021 (USD MILLION)	111
TABLE 38	ELECTRIC MOTOR GRADER MARKET, BY REGION, 2022-2027 (USD MILLION)	112
6.5	ELECTRIC DOZER	112
6.5.1	ELECTRIC DOZERS PREFERRED OWING TO NOISE-FREE AND EMISSION-FREE OPERATION	112
TABLE 39	ELECTRIC DOZER MARKET, BY REGION, 2018-2021 (UNITS)	112
TABLE 40	ELECTRIC DOZER MARKET, BY REGION, 2022-2027 (UNITS)	113
TABLE 41	ELECTRIC DOZER MARKET, BY REGION, 2018-2021 (USD MILLION)	113
TABLE 42	ELECTRIC DOZER MARKET, BY REGION, 2022-2027 (USD MILLION)	113
6.6	ELECTRIC DUMP TRUCK	114
6.6.1	ELECTRIC DUMP TRUCKS UTILIZED FOR CARRYING MATERIALS IN SURFACE AND UNDERGROUND MINING ACTIVITIES	114
TABLE 43	ELECTRIC DUMP TRUCK MARKET, BY REGION, 2018-2021 (UNITS)	114
TABLE 44	ELECTRIC DUMP TRUCK MARKET, BY REGION, 2022-2027 (UNITS)	114
TABLE 45	ELECTRIC DUMP TRUCK MARKET, BY REGION, 2018-2021 (USD MILLION)	114
TABLE 46	ELECTRIC DUMP TRUCK MARKET, BY REGION, 2022-2027 (USD MILLION)	115
6.7	ELECTRIC LOAD-HAUL-DUMP LOADER (LHD)	115
6.7.1	ELECTRIC LHD LOADER PROVIDES RUGGEDNESS, HIGH MANEUVERABILITY, AND PRODUCTIVITY	115
TABLE 47	ELECTRIC LHD MARKET, BY REGION, 2018-2021 (UNITS)	115
TABLE 48	ELECTRIC LHD MARKET, BY REGION, 2022-2027 (UNITS)	116
TABLE 49	ELECTRIC LHD MARKET, BY REGION, 2018-2021 (USD MILLION)	116
TABLE 50	ELECTRIC LHD MARKET, BY REGION, 2022-2027 (USD MILLION)	116
7	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY CAPACITY	117
7.1	INTRODUCTION	118
7.1.1	RESEARCH METHODOLOGY	118
7.1.2	ASSUMPTIONS	118
7.1.3	INDUSTRY INSIGHTS	118
FIGURE 31	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY CAPACITY, 2022 VS. 2027 (USD MILLION)	119
TABLE 51	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY CAPACITY, 2018-2021 (UNITS)	119
TABLE 52	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY CAPACITY, 2022-2027 (UNITS)	120
TABLE 53	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY CAPACITY, 2018-2021 (USD MILLION)	120
TABLE 54	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY CAPACITY, 2022-2027 (USD MILLION)	120
7.2	<50 KWH	121
7.2.1	<50 KWH SUITED FOR SMALL AND COMPACT EQUIPMENT	121
TABLE 55	<50 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	121
TABLE 56	<50 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	121
TABLE 57	<50 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	121
TABLE 58	<50 KWH: ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	122
7.3	50-200 KWH	122
7.3.1	50-200 KWH BATTERY CAPACITY SEGMENT LEADING DUE TO HIGHER DEMAND FOR SMALL AND MID-RANGE OFF-HIGHWAY	

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EQUIPMENT

TABLE 59 50-200 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)

TABLE 60 50-200 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)

TABLE 61 50-200 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)

TABLE 62 50-200 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)

7.4 200-500 KWH

7.4.1 MOTOR GRADERS, DOZERS, MID-SIZED EXCAVATORS, AND LHD PRIMARILY AVAILABLE WITH BATTERY CAPACITY OF 200-500 KWH

TABLE 63 200-500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)

TABLE 64 200-500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)

TABLE 65 200-500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)

TABLE 66 200-500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)

7.5 >500 KWH

7.5.1 >500 KWH BATTERY CAPACITY EQUIPMENT YET TO BE FULLY COMMERCIALIZED DUE TO POWER-TO-WEIGHT RATIO ISSUES

TABLE 67 >500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)

TABLE 68 >500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)

TABLE 69 >500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)

TABLE 70 >500 KWH: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)

8 ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY TYPE

8.1 INTRODUCTION

8.1.1 RESEARCH METHODOLOGY

8.1.2 ASSUMPTIONS

8.1.3 INDUSTRY INSIGHTS

FIGURE 32 ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY TYPE, 2022 VS. 2027 (USD MILLION)

TABLE 71 ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY TYPE, 2018-2021 (UNITS)

TABLE 72 ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY TYPE, 2022-2027 (UNITS)

TABLE 73 ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY TYPE, 2018-2021 (USD MILLION)

TABLE 74 ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY BATTERY TYPE, 2022-2027 (USD MILLION)

8.2 LITHIUM-ION

8.2.1 HIGH ENERGY DENSITY AND LONGER BATTERY BACKUP OVER OTHER BATTERIES DRIVE LITHIUM-ION BATTERY MARKET

TABLE 75 LITHIUM-ION: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)

TABLE 76 LITHIUM-ION: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)

TABLE 77 LITHIUM-ION: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)

TABLE 78 LITHIUM-ION: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)

8.3 LEAD-ACID

8.3.1 LOW MANUFACTURING COST DRIVES DEMAND FOR LEAD-ACID BATTERIES IN ELECTRIC CONSTRUCTION EQUIPMENT

TABLE 79 LEAD-ACID: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)

TABLE 80 LEAD-ACID: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)

TABLE 81 LEAD-ACID: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)

TABLE 82 LEAD-ACID: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)

8.4 OTHER BATTERIES

8.4.1 THERMAL MANAGEMENT CONCERNS WITH OTHER TYPES OF BATTERIES

TABLE 83 OTHER BATTERIES: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)

TABLE 84 OTHER BATTERIES: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)

TABLE 85 OTHER BATTERIES: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)

TABLE 86 OTHER BATTERIES: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)

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9	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY POWER OUTPUT	136
9.1	INTRODUCTION	137
9.1.1	RESEARCH METHODOLOGY	137
9.1.2	ASSUMPTIONS	137
9.1.3	INDUSTRY INSIGHTS	138
FIGURE 33	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY POWER OUTPUT, 2022 VS. 2027 (USD MILLION)	138
TABLE 87	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY POWER OUTPUT, 2018-2021 (UNITS)	138
TABLE 88	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY POWER OUTPUT, 2022-2027 (UNITS)	139
TABLE 89	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY POWER OUTPUT, 2018-2021 (USD MILLION)	139
TABLE 90	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY POWER OUTPUT, 2022-2027 (USD MILLION)	139
9.2	<50 HP	140
9.2.1	RISING DEMAND FOR COMPACT ELECTRIC OFF-HIGHWAY EQUIPMENT TO DRIVE SEGMENT	140
TABLE 91	<50 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	140
TABLE 92	<50 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	140
TABLE 93	<50 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	140
TABLE 94	<50 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	141
9.3	50-150 HP	141
9.3.1	INCREASING LAUNCHES OF LOW TO MEDIUM-POWERED ELECTRIC OFF-HIGHWAY EQUIPMENT TO DRIVE SEGMENT	141
TABLE 95	50-150 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	141
TABLE 96	50-150 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	142
TABLE 97	50-150 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	142
TABLE 98	50-150 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	142
9.4	150-300 HP	143
9.4.1	AMERICAS: LEADING MARKET FOR 150-300 HP TRACTORS	143
TABLE 99	150-300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	143
TABLE 100	150-300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	143
TABLE 101	150-300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	143
TABLE 102	150-300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	144
9.5	>300 HP	144
9.5.1	ELECTRIC OFF-HIGHWAY EQUIPMENT WITH >300 HP SUITABLE FOR LARGE CONSTRUCTION AND MINING OPERATIONS	144
TABLE 103	>300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	144
TABLE 104	>300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	145
TABLE 105	>300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	145
TABLE 106	>300 HP: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	145
10	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY APPLICATION	146
10.1	INTRODUCTION	147
10.1.1	RESEARCH METHODOLOGY	147
10.1.2	ASSUMPTIONS	147
10.1.3	INDUSTRY INSIGHTS	148
FIGURE 34	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY APPLICATION, 2022 VS. 2027 (USD MILLION)	148
TABLE 107	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY APPLICATION, 2018-2021 (UNITS)	148
TABLE 108	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY APPLICATION, 2022-2027 (UNITS)	149
TABLE 109	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY APPLICATION, 2018-2021 (USD MILLION)	149
TABLE 110	ELECTRIC OFF-HIGHWAY EQUIPMENT MARKET, BY APPLICATION, 2022-2027 (USD MILLION)	149
10.2	CONSTRUCTION	150
10.2.1	EMISSION AND NOISE REGULATIONS IN URBAN OR CLOSED CONSTRUCTION AREAS TO DRIVE DEMAND FOR ELECTRIC CONSTRUCTION EQUIPMENT	150

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TABLE 111	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	150
TABLE 112	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	150
TABLE 113	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	151
TABLE 114	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	151
10.3	MINING	151
10.3.1	REDUCTION IN VENTILATION COSTS IN UNDERGROUND MINING TO DRIVE MARKET	151
TABLE 115	ELECTRIC MINING EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	152
TABLE 116	ELECTRIC MINING EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	152
TABLE 117	ELECTRIC MINING EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	152
TABLE 118	ELECTRIC MINING EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	152
10.4	GARDENING	153
10.4.1	EASE OF INCORPORATING ELECTRIC DRIVE SYSTEM IN LAWNMOWERS TO DRIVE SEGMENT	153
TABLE 119	ELECTRIC GARDENING EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	153
TABLE 120	ELECTRIC GARDENING EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	154
TABLE 121	ELECTRIC GARDENING EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	154
TABLE 122	ELECTRIC GARDENING EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	154
10.5	AGRICULTURE	155
10.5.1	ELECTRIC AGRICULTURE EQUIPMENT IMPROVES FARMING EFFICIENCY AND PRODUCTIVITY BY ACCELERATING FARM MECHANIZATION	155
TABLE 123	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	155
TABLE 124	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	155
TABLE 125	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	155
TABLE 126	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	156
11	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY PROPULSION	157
11.1	INTRODUCTION	158
11.1.1	RESEARCH METHODOLOGY	158
11.1.2	ASSUMPTIONS	158
11.1.3	INDUSTRY INSIGHTS	159
FIGURE 35	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY PROPULSION, 2022 VS. 2027 (USD MILLION)	159
TABLE 127	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY PROPULSION, 2018-2021 (UNITS)	159
TABLE 128	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY PROPULSION, 2022-2027 (UNITS)	160
TABLE 129	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY PROPULSION, 2018-2021 (USD MILLION)	160
TABLE 130	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY PROPULSION, 2022-2027 (USD MILLION)	160
11.2	HYBRID-ELECTRIC	161
11.2.1	HYBRID-ELECTRIC EQUIPMENT EFFECTIVELY BRIDGES TECHNOLOGY GAP BETWEEN CONVENTIONAL AND BATTERY-ELECTRIC EQUIPMENT	161
TABLE 131	HYBRID-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	161
TABLE 132	HYBRID-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	161
TABLE 133	HYBRID-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	161
TABLE 134	HYBRID-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	162
11.3	BATTERY-ELECTRIC	162
11.3.1	STRINGENT EMISSION REGULATIONS DRIVE DEMAND FOR BATTERY-ELECTRIC EQUIPMENT	162
TABLE 135	BATTERY-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	162
TABLE 136	BATTERY-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	163
TABLE 137	BATTERY-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	163
TABLE 138	BATTERY-ELECTRIC: CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	163
12	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY EQUIPMENT TYPE	164

12.1	INTRODUCTION	165
12.1.1	RESEARCH METHODOLOGY	165
12.1.2	ASSUMPTIONS	165
12.1.3	INDUSTRY INSIGHTS	165
FIGURE 36	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022 VS. 2027 (USD MILLION)	166
TABLE 139	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (UNITS)	166
TABLE 140	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (UNITS)	166
TABLE 141	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (USD MILLION)	167
TABLE 142	ELECTRIC AGRICULTURE EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (USD MILLION)	167
12.2	ELECTRIC LAWN MOWER	167
12.2.1	HIGH FUEL EXPENSES AND WORKFORCE SHORTAGE IN GARDENING DRIVE DEVELOPMENT OF ELECTRIC LAWN MOWERS	167
TABLE 143	ELECTRIC LAWN MOWER MARKET, BY REGION, 2018-2021 (UNITS)	168
TABLE 144	ELECTRIC LAWN MOWER MARKET, BY REGION, 2022-2027 (UNITS)	168
TABLE 145	ELECTRIC LAWN MOWER MARKET, BY REGION, 2018-2021 (USD MILLION)	168
TABLE 146	ELECTRIC LAWN MOWER MARKET, BY REGION, 2022-2027 (USD MILLION)	168
12.3	ELECTRIC SPRAYER	169
12.3.1	NEED TO ELIMINATE WITHERING OF CROPS TO DRIVE SEGMENT	169
TABLE 147	ELECTRIC SPRAYER MARKET, BY REGION, 2018-2021 (UNITS)	169
TABLE 148	ELECTRIC SPRAYER MARKET, BY REGION, 2022-2027 (UNITS)	169
TABLE 149	ELECTRIC SPRAYER MARKET, BY REGION, 2018-2021 (USD MILLION)	169
TABLE 150	ELECTRIC SPRAYER MARKET, BY REGION, 2022-2027 (USD MILLION)	170
12.4	ELECTRIC TRACTOR	170
12.4.1	RIISING DEMAND FOR FOOD GRAIN PRODUCTS FUELS TECHNOLOGICAL ADVANCEMENTS IN AGRICULTURE INDUSTRY	170
TABLE 151	ELECTRIC TRACTOR MARKET, BY REGION, 2018-2021 (UNITS)	170
TABLE 152	ELECTRIC TRACTOR MARKET, BY REGION, 2022-2027 (UNITS)	171
TABLE 153	ELECTRIC TRACTOR MARKET, BY REGION, 2018-2021 (USD MILLION)	171
TABLE 154	ELECTRIC TRACTOR MARKET, BY REGION, 2022-2027 (USD MILLION)	171
13	ELECTRIC TRACTOR MARKET, BY PROPULSION	172
13.1	INTRODUCTION	173
13.1.1	RESEARCH METHODOLOGY	173
13.1.2	ASSUMPTIONS	174
13.1.3	INDUSTRY INSIGHTS	174
FIGURE 37	ELECTRIC TRACTOR MARKET, BY PROPULSION, 2022 VS. 2027 (USD MILLION)	174
TABLE 155	ELECTRIC TRACTOR MARKET, BY PROPULSION, 2018-2021 (UNITS)	174
TABLE 156	ELECTRIC TRACTOR MARKET, BY PROPULSION, 2022-2027 (UNITS)	175
TABLE 157	ELECTRIC TRACTOR MARKET, BY PROPULSION, 2018-2021 (USD MILLION)	175
TABLE 158	ELECTRIC TRACTOR MARKET, BY PROPULSION, 2022-2027 (USD MILLION)	175
13.2	HYBRID-ELECTRIC	175
13.2.1	INCREASING DEMAND FOR MEDIUM AND HEAVY-DUTY TRACTORS TO DRIVE SEGMENT	175
TABLE 159	HYBRID-ELECTRIC TRACTOR MARKET, BY REGION, 2018-2021 (UNITS)	176
TABLE 160	HYBRID-ELECTRIC TRACTOR MARKET, BY REGION, 2022-2027 (UNITS)	176
TABLE 161	HYBRID-ELECTRIC TRACTOR MARKET, BY REGION, 2018-2021 (USD MILLION)	176
TABLE 162	HYBRID-ELECTRIC TRACTOR MARKET, BY REGION, 2022-2027 (USD MILLION)	177
13.3	BATTERY-ELECTRIC	177
13.3.1	STRINGENT EMISSION NORMS EXPECTED TO DRIVE SEGMENT	177
TABLE 163	BATTERY-ELECTRIC TRACTOR MARKET, BY REGION, 2018-2021 (UNITS)	177
TABLE 164	BATTERY-ELECTRIC TRACTOR MARKET, BY REGION, 2022-2027 (UNITS)	178

TABLE 165	BATTERY-ELECTRIC TRACTOR MARKET, BY REGION, 2018-2021 (USD MILLION)	178
TABLE 166	BATTERY-ELECTRIC TRACTOR MARKET, BY REGION, 2022-2027 (USD MILLION)	178
14	ELECTRIC CONSTRUCTION AND MINING EQUIPMENT MARKET, BY PROPULSION	179
14.1	INTRODUCTION	180
14.1.1	RESEARCH METHODOLOGY	180
14.1.2	ASSUMPTIONS	181
14.1.3	INDUSTRY INSIGHTS	181
FIGURE 38	ELECTRIC CONSTRUCTION AND MINING EQUIPMENT MARKET, BY PROPULSION, 2022 VS. 2027 (USD MILLION)	181
TABLE 167	ELECTRIC CONSTRUCTION AND MINING EQUIPMENT MARKET, BY PROPULSION, 2018-2021 (UNITS)	181
TABLE 168	ELECTRIC CONSTRUCTION AND MINING EQUIPMENT MARKET, BY PROPULSION, 2022-2027 (UNITS)	182
TABLE 169	ELECTRIC CONSTRUCTION AND MINING EQUIPMENT MARKET, BY PROPULSION, 2018-2021 (USD MILLION)	182
TABLE 170	ELECTRIC CONSTRUCTION AND MINING EQUIPMENT MARKET, BY PROPULSION, 2022-2027 (USD MILLION)	182
14.2	HYBRID-ELECTRIC	183
14.2.1	HYBRID-ELECTRIC EQUIPMENT TO WITNESS HIGH DEMAND DUE TO FUEL EFFICIENCY	183
TABLE 171	HYBRID-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	183
TABLE 172	HYBRID-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	183
TABLE 173	HYBRID-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	184
TABLE 174	HYBRID-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	184
14.3	BATTERY-ELECTRIC	184
14.3.1	NOISE AND EMISSION REGULATIONS TO DRIVE SEGMENT DURING FORECAST PERIOD	184
TABLE 175	BATTERY-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	185
TABLE 176	BATTERY-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	185
TABLE 177	BATTERY-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	185
TABLE 178	BATTERY-ELECTRIC: CONSTRUCTION AND MINING EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	186
15	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION	187
15.1	INTRODUCTION	188
15.1.1	RESEARCH METHODOLOGY	188
15.1.2	ASSUMPTIONS	189
15.1.3	INDUSTRY INSIGHTS	189
FIGURE 39	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022 VS. 2027 (USD MILLION)	189
TABLE 179	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (UNITS)	190
TABLE 180	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (UNITS)	190
TABLE 181	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2018-2021 (USD MILLION)	190
TABLE 182	ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY REGION, 2022-2027 (USD MILLION)	190
15.2	ASIA PACIFIC	191
FIGURE 40	ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY COUNTRY, 2022 VS. 2027 (USD MILLION)	191
TABLE 183	ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY COUNTRY, 2018-2021 (UNITS)	191
TABLE 184	ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY COUNTRY, 2022-2027 (UNITS)	192
TABLE 185	ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY COUNTRY, 2018-2021 (USD MILLION)	192
TABLE 186	ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY COUNTRY, 2022-2027 (USD MILLION)	192
15.2.1	CHINA	193
15.2.1.1	Innovations and developments by leading Chinese players to drive market	193
TABLE 187	CHINA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (UNITS)	193
TABLE 188	CHINA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (UNITS)	194
TABLE 189	CHINA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (USD MILLION)	194
TABLE 190	CHINA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (USD MILLION)	195
15.2.2	INDIA	196

15.2.2.1 Demand for eco-friendly and cost-effective off-highway equipment to drive market 196

TABLE 191 INDIA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (UNITS) 196

TABLE 192 INDIA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (UNITS) 197

TABLE 193 INDIA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (USD MILLION) 197

TABLE 194 INDIA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (USD MILLION) 198

15.2.3 JAPAN 199

15.2.3.1 Demand for noise and emission-free compact construction equipment to aid market growth 199

TABLE 195 JAPAN: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (UNITS) 199

TABLE 196 JAPAN: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (UNITS) 200

TABLE 197 JAPAN: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (USD MILLION) 200

TABLE 198 JAPAN: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (USD MILLION) 201

15.2.4 SOUTH KOREA 202

15.2.4.1 Increasing demand for zero-emission equipment and farming automation to aid market growth 202

TABLE 199 SOUTH KOREA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (UNITS) 202

TABLE 200 SOUTH KOREA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (UNITS) 203

TABLE 201 SOUTH KOREA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (USD MILLION) 203

TABLE 202 SOUTH KOREA: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (USD MILLION) 204

15.2.5 REST OF ASIA PACIFIC 204

15.2.5.1 Increasing construction activities, presence of large mines, and rising awareness about equipment electrification to drive market 204

TABLE 203 REST OF ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (UNITS) 205

TABLE 204 REST OF ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (UNITS) 205

TABLE 205 REST OF ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2018-2021 (USD MILLION) 206

TABLE 206 REST OF ASIA PACIFIC: ELECTRIC CONSTRUCTION EQUIPMENT MARKET, BY EQUIPMENT TYPE, 2022-2027 (USD MILLION) 206

Electric Construction Equipment Market by Equipment Type, Battery Capacity, Battery Type, Power Output, Application, Propulsion, Electric Tractor Market, Electric Construction & Mining Equipment Market and Region - Global Forecast to 2027

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