

Future of the EV: Assessing Battery and Metals Supply

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INTRODUCTION

Scope

Key findings

Electrification is one of the major megatrends shaping the mobility and automotive industries

The EV industry today

EV BATTERY MARKET DRIVERS

EV transition is driving demand for critical metals and minerals

Shift to pure EVs will require larger battery packs and greater supply of minerals and metals

Electrification of heavy-duty vehicles will further raise demand for minerals and metals

Major governments are actively stepping in to reinforce domestic EV battery production

Incentives have buoyed automakers to expand battery manufacturing

METALS SUPPLY FOR EV BATTERIES

China continues to dominate battery production yet other countries aim to catch up

METALS SUPPLY FOR EV BATTERIES

NMC batteries dominate yet cheaper alternatives are gaining ground

Expanding global production of batteries will create strong demand for metals

Reserves of metals are sufficient, but production fails to meet the projected demand

Cobalt shortages forecast to continue due to difficulties expanding mining capacity

Rising demand and geopolitical tensions threaten graphite supply

Lithium and nickel supply needs to increase to avoid price hikes and production disruptions

Supply of metals will be underpinned by geopolitics

Exploration of new metal deposits will accelerate, but extraction can be difficult

FUTURE-PROOFING FOR SUCCESS

Four ways to achieve success in the EV battery and metals supply industry

Upstream supply: OEMs will need to focus on the upstream supply process to build success

Case study: Tesla opening a lithium refinery capable of supplying one million EVs annually

Case study: Volkswagen establishes joint ventures to build battery supply chain in Indonesia

Lower cost: Cheaper battery chemistries including LFPs are emerging to reduce EV cost

Case study: BYD moving forward with the production of cheaper sodium-ion batteries

Longer range: Solid-state batteries are seen as the new gold-standard for future EVs

Case study: Toyota developing a solid-state battery with a range of over 1,000km

Recycling: Metals supply can be improved by boosting recycling intensities

Case study: EMR and Northvolt launch battery recycling plant in Hamburg

Other key innovations in the EV battery industry

CONCLUSION

Key commercial takeaways for the EV battery industry

Summary 1 key points

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