TÜRKİYE CRITICAL ENERGY MINERALS OUTLOOK | 2025

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IICEC energy outlook series supports more secure, efficient, competitive, clean, and sustainable energy future objectives.

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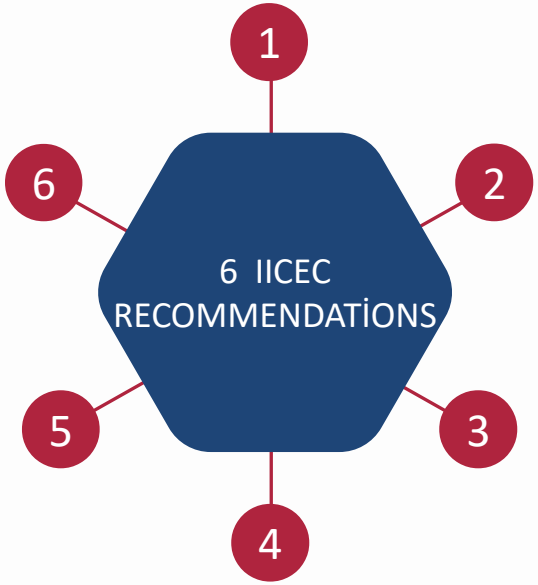
TCEMO provides solid recommendations to address increasing risks and realize emerging opportunities across the critical energy minerals supply chain.

WHY?

- The increasing use and importance of critical minerals across a wide range of strategic sectors in addition to energy
- Deepening energy security, economic, and national security risks due to several factors including the high geographical concentration of supply and export restrictions
- Türkiye's emerging policy priorities centered on critical minerals
- Multi-dimensional development areas that would support a more secure and value-added future for critical minerals

HOW?

- Global dynamics, evolving risks, and proposed and emerging solutions
- Türkiye's policy priorities, targets, and current sectoral trends in critical minerals
- IICEC's energy outlook series & holistic energy modelling framework
- Critical minerals–focused quantitative analysis and innovative perspectives
- Stakeholder engagement built on the Public–Industry–Academia success triangle
- An independent, participatory and exemplary study



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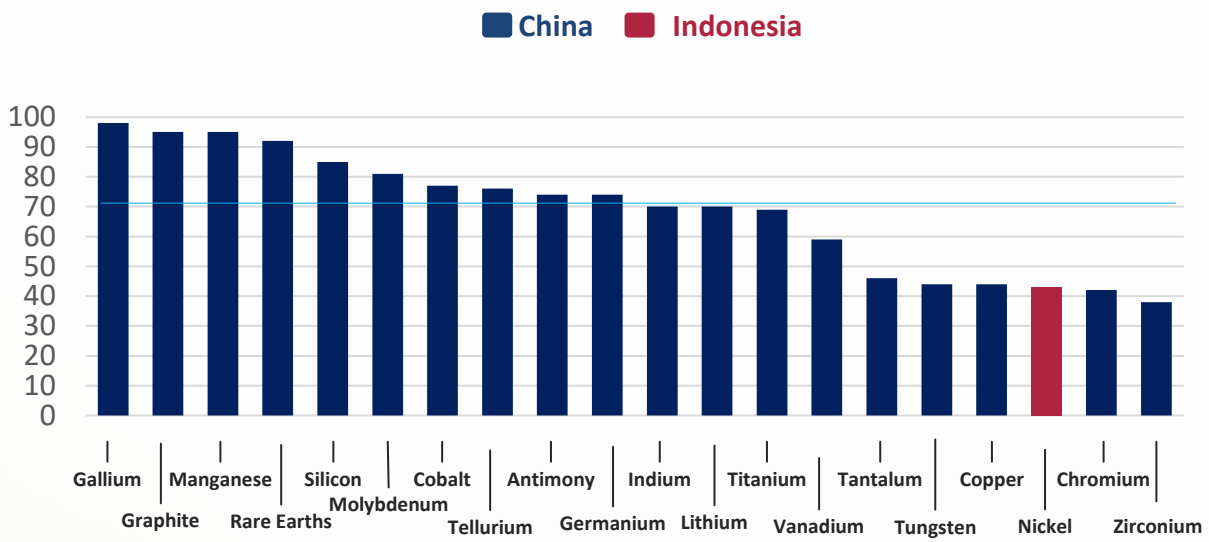
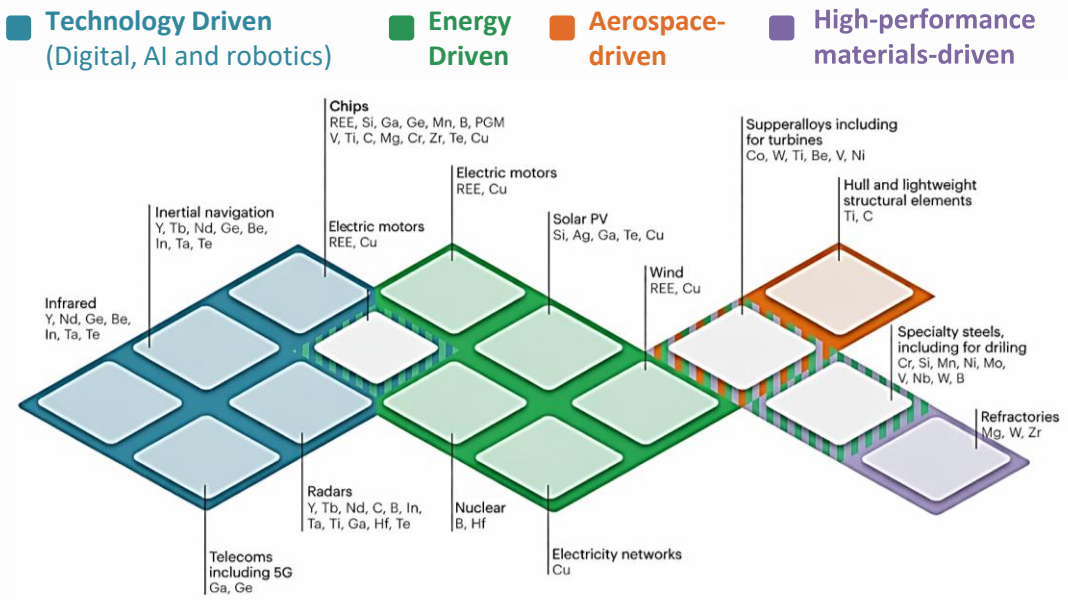
Energy security, economic and national security risks are on rise due to high geographical concentration in critical minerals -essential inputs for energy technologies and many strategic sectors.

Top Supplier in the Refining of 20 Energy-Related Strategic Minerals (%)



Common and Widespread Use of Critical Minerals in Energy and Other Strategic Sectors

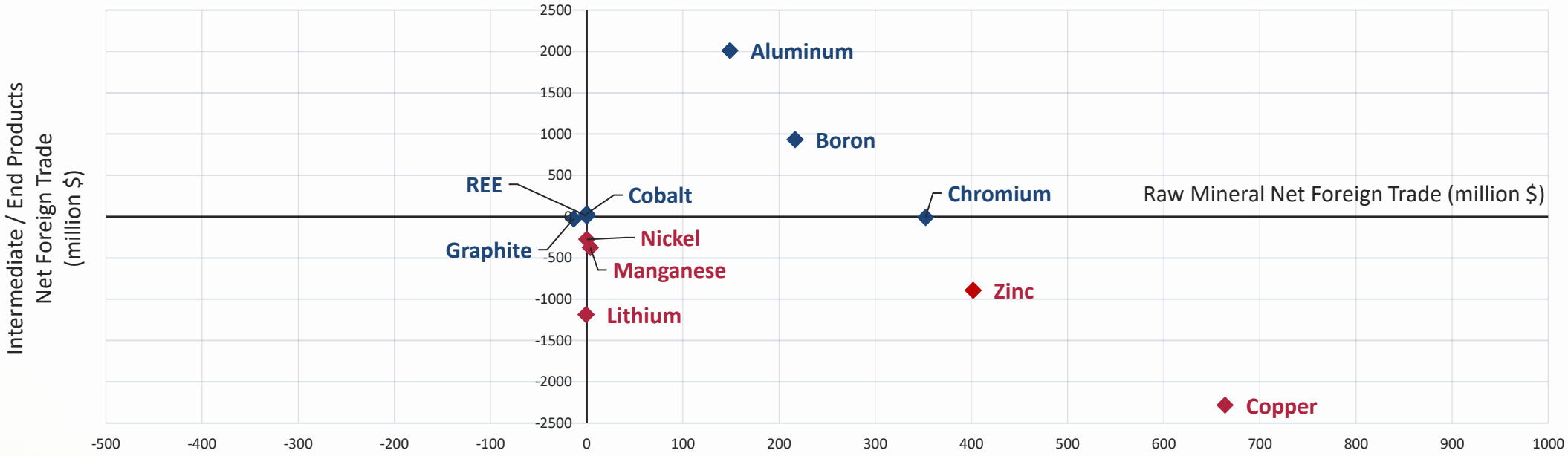


IEA World Energy Outlook, IEA Global Critical Minerals Outlook, 2025

High dependence on a single country, especially in refining (70% on average and reaching up to 90% for certain minerals) combined with the increasing export restrictions and geopolitical dynamics are exacerbating risks.

Türkiye's critical minerals value chain remains heavily weighted toward the mining stage, while refining and processing capacities are underdeveloped.

Trade Balances for Selected Critical Minerals (2024, million $)

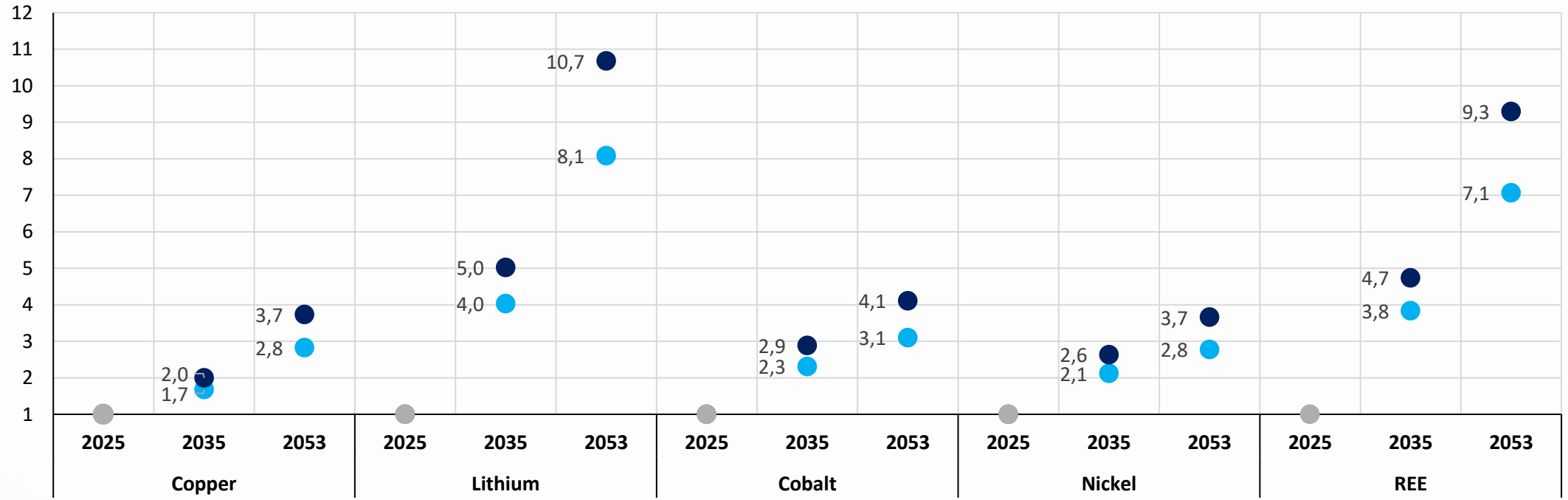


Minerals Foreign Trade Statistics, IICEC Analysis

Capacity development that transforms growth in mineral production into higher value-added and sustainable output will support advancement along the value chain while strengthening supply security.

Annual demand for important key critical energy minerals is estimated to increase by three-to eleven-fold by 2053; growing use in non-energy sectors will further increase demand.

Annual Demand Trends for Selected Critical Energy Minerals (2025-2053, 2025=1)



IICEC Model and Analysis

In the absence of a scale-up in refining, processing, and end-use manufacturing capacities aligned with rising demand, import dependence and supply risks will increase.

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Evolving policies and sectoral trends point to a strengthening strategic management perspective in critical minerals.

Türkiye Critical and Strategic Minerals Report 2025

Policy Priorities

Next Step

IICEC Synthesis

A comprehensive Strategy Paper is expected to be released in the near future.

Rising risks and emerging opportunities underscore priority development areas requiring strategic planning.

RISKS

- Energy security risks
- Risks for strategic sectors beyond energy
- Trade balance and macroeconomy risks

OPPORTUNITIES

- Increase in economic reserves and value-added production
- The global quest for diversification and alternative suppliers, particularly in refining and processing
- Domestic market with strong demand dynamics, technology ecosystem, and multi-faceted partnerships

STRATEGİC PLANNING

- Key policy instruments and roadmaps
- Development of inventories for mining and the holistic value chain
- Refining-focused strategic growth
- Investment incentive models, sustainability, innovation and technology
- Diplomacy, regional and international cooperation
- Targeted approaches in minerals and technologies

Comprehensive Strategic Planning

6 IICEC Recommendations

1. **Defining stockpiling mechanisms and developing roadmaps that enhance high value-added production, supply diversification, and resilience to risks,**
2. **Establishing up-to-date, detailed, and integrated inventories across mining and the wider supply chain in order to identify economic potential and strengthen predictability,**
3. **Capitalizing on emerging opportunities to become a regional and global player in refining through long-term planning, strategic investment and technology models,**
4. **Strengthening investment incentive frameworks, innovation and R&D capabilities, workforce programs, and institutional capacities to support value-added and sustainable growth.**
5. **Leveraging Türkiye's strategic location, diplomacy, and international cooperation to capture multidimensional economic and strategic benefits, including:**
   - → Positioning in mining and refining through public and private sector investments, particularly in Africa, where reserves and production potential are high,
   - → Utilizing supply, trade, and recycling opportunities with demand markets where security, diversification, and competitiveness needs are increasing,
   - → Contributing to coordination mechanisms through active participation in the IEA Critical Minerals Security Program.
6. **Adopting mineral- and technology-specific approaches, with particular emphasis on:**
   - → Developing the large Rare Earth Element resource discovery through a strategic value chain spanning from reserve verification to end products,
   - → Materializing opportunities to become a production, innovation, and supply hub in lithium and battery technologies;
   - → Advancing international and cross-sectoral cooperation focused on technological development in areas such as refining, battery cathode and anode materials, and high-efficiency permanent magnets,
   - → Continuing to develop exploration, value-added production, and processing capacities in copper.

with Executive Summary

THANK YOU

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