

Assessing the business potential, price volatility and supply chain challenges of silicon metal in the European Union

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Abstract-

The European Union (EU) is heavily reliant on raw materials, some of which pose critical supply challenges. The EU's Critical Raw Materials (CRM) policy, initiated in 2011 and recently reinforced by the 2023 Critical Raw Materials Act, seeks to ensure the sustainable supply of crucial raw materials due to scarcity or economic importance. One such sector significantly affected is photovoltaic (PV) energy production, which faces challenges due to the scarcity of materials like silicon metal, crucial for PV cell manufacturing. Despite efforts to mitigate supply risks, challenges persist, including limited recycling and dependency on imports. This study evaluates annual silicon prices and volatility to assess the business potential of silicon metal production in the EU under current import reliance and 2030 targets. Analysing production trends and applications reveals a concentrated supply chain and diverse industrial uses of silicon metal. Price analysis highlights specific events influencing silicon metal prices, emphasizing its criticality to various economic sectors.

Index Terms- Critical Raw Materials; Silicon metal; Price volatility

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