

Silex World Unveils Modular Micro-Refinery Model for Allied Critical Materials Supply Chains

Modular micro-refineries enable regional processing of rare earths and strategic metals closer to feedstock, industry, and allied supply chains.

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/EINPresswire.com/ -- [Silex](#) World Ltd, a University of Leeds spinout focused on critical materials processing, today announced the development of a modular micro-refinery platform designed to enable distributed refining of rare earth elements and strategic metals closer to feedstock sources, industrial demand, and allied manufacturing supply chains.



Critical Materials Supply Chain

The platform combines Silex World’s alkali-based recovery process, continuous low-energy conversion system, and digital traceability architecture into compact modular units intended for deployment near recycling centres, industrial waste streams, ports, and advanced manufacturing clusters.

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The strategic bottleneck in critical materials is increasingly refining capacity. We are building deployable infrastructure designed for regional, resilient supply chains.”

Michael Hodges

The company is currently advancing its first industrial rollout in India through local production partnerships and feedstock integration discussions, with the objective of validating continuous modular processing under real-world operating conditions before wider deployment across the United States and Europe.

Western governments are increasingly recognising that the strategic bottleneck in critical materials is no longer mining alone, but refining and processing capacity. Existing supply chains remain heavily concentrated in large centralised facilities, creating geopolitical exposure, transport inefficiencies, and barriers to rapid regional scale-up.

Silex World's approach is designed around smaller-scale processing infrastructure capable of operating closer to end-of-life NdFeB magnets, industrial residues, manufacturing scrap, and downstream industrial demand.

The company believes this distributed refining model could significantly improve supply chain resilience while reducing transport dependency, infrastructure intensity, and reliance on geographically concentrated processing capacity.

Rare earth elements and specialty metals underpin sectors including defence, electrification, semiconductors, renewable energy, and advanced manufacturing. However, current supply chains remain vulnerable to disruption due to concentration of refining capability and growing competition for strategic materials.

Silex World's modular platform is designed to enable:

- Processing of rare earth-bearing waste and industrial residues close to feedstock source
- Continuous metal recovery and conversion within compact modular units
- Lower transport and infrastructure dependency versus centralised refining
- Digital traceability and chain-of-custody verification across the process pathway
- Scalable deployment through distributed regional processing networks

The company believes the approach represents a shift away from traditional refinery models toward distributed critical materials infrastructure capable of supporting allied industrial ecosystems and regional supply chain resilience.

Michael Hodges, Founder of Silex World Ltd, said:

"The bottleneck in critical materials is no longer just mining. It is refining capacity. What we are building is deployable processing infrastructure that can operate closer to feedstock, manufacturing, and strategic demand."

He added:

"The future of critical materials production is unlikely to be dominated by a handful of giant refineries. It will increasingly depend on distributed processing networks that are regional, traceable, and resilient."

The platform has been developed with compatibility across multiple rare earth-containing feedstocks and industrial material streams. Silex World is currently engaging with industrial partners, government bodies, and regional stakeholders to explore deployment opportunities for modular processing systems in strategic markets.

The company believes the technology aligns closely with emerging policy initiatives focused on domestic refining capability, industrial resilience, circular materials recovery, and allied supply chain security across the United States, Europe, India, and other partner economies.

About Silex World Ltd

Silex World Ltd is a technology company focused on the recovery and processing of critical materials, including rare earth elements, using scalable low-energy methods. A spinout from the University of Leeds, the company is developing processing systems designed to support resilient supply chains and reduce dependence on imported refining capacity.

Image is for illustrative purposes only.

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