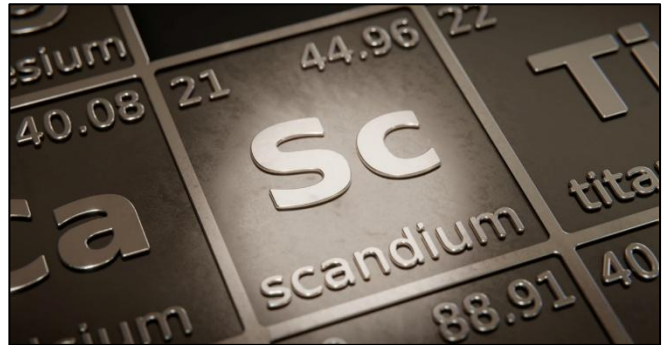


Scandium Stockpiling: the new minerals arms race

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Scandium has quietly shifted from an obscure industrial input to a geopolitical bargaining tool. In mid-2025, Beijing brought it under its export licensing system, meaning buyers now wait longer and face tougher approvals. The EU reacted in July with a formal resolution criticising the move, underlining how even minor minerals are being pulled into bigger trade disputes.



In volume terms, the market is still tiny. The US Defence Logistics Agency plans to buy up to US\$40 million of scandium oxide over five years, equal to about 6.4 tonnes. The first delivery, just under two tonnes, is already close to five percent of 2024's global output. Rio Tinto's Canadian facility produces only about three tonnes a year, which shows how one government tender can shift a market where pricing is not clear and liquidity is thin.

Most of the demand scandium oxide comes from aerospace and defence alloys, where qualification takes years and the source of material is scrutinised. Industry outlooks still see steady aircraft build rates and ongoing materials innovation, both of which favour strong, lightweight metals. This puts impetus less on opening new mines and more on securing reliable, audited midstream capacity.

Policy is now turning toward the midstream. The Payne Institute notes that the quickest way to build resilience is through 'waste-to-market' processing and domestic plants able to handle mixed stocks. Governments are moving the same way, putting less money into exploration grants and more into refining and separation. In practice, that means backing projects that turn tailings into saleable material and funding alloy qualification alongside new mines.

What's advancing fastest and where it can stall

Supply growth is coming first from by-products. Rio Tinto's Quebec plant, the first commercial scandium oxide facility in North America, pulls material from titanium dioxide waste and is already lined up to supply US stockpile orders. This shows how midstream capacity, not new mines, is what's shaping the market. Company reports stress high-purity output and a 'domestic processing capacity' approach, and mainstream media's coverage of the DLA tender confirms Rio Tinto can deliver in the near term.

The pipeline is widening, but uneven. Russia's RUSAL is building a pilot unit at Bogoslovsky (target 1.55 t/y scandium oxide by end-2025), while various projects pursue by-product recovery from alumina and Titanium streams, as well as recycling and powder-metallurgy scale-up. All of these projects run into the same problems, from financing that depends on agreements to long timelines and the challenge of keeping intellectual property secure. However, momentum could still be stalled by two main bottlenecks. Alloy qualification in aerospace and defence takes years, and certification cycles do not shorten even when supply is tight. China's new export licensing on scandium and other strategic materials has already stretched lead times, adding policy risk to feedstock and equipment sourcing. On top of that, environmental approvals, power reliability and a thin vendor base for separation equipment all threaten to slow project ramp-up.

The priority is to secure offtakes with by-product producers that can be audited, while helping to fund alloy and powder qualification to reduce approval timelines. Securing reliable access to critical equipment is also just as important. The projects with the best near-term prospects are those that pair refining upgrade feeds with domestic processing, since they are closest to profitable outputs.

How industry is navigating: OEMs, defence primes, traders

Procurement teams are shifting toward using several suppliers at once and tightening offtake agreements. Recent contracts often let buyers' step in if a project runs into trouble. They also set limits on pricing and require clear proof of where the material is sourced. In aerospace and defence, approval times is an issue, so companies are securing deals with trusted processors in friendly countries, while running substitution trials to keep projects on track and costs in check.

Compliance demands are tightening and China's 2025 licensing rules for critical materials are already causing delays and creating supply risks. Boards expect supply paths that can be tracked in detail. They also want clear protections for intellectual property with non-OECD processors, plus regular outside reviews to verify both custody of material and ESG claims.

Treasury teams are adjusting quickly. Liquidity is thin and prices are unstable, so companies are holding larger cash reserves to protect working capital. They are also timing their inventory decisions against government stockpile schedules. At the same time, many are running stress tests to see how much risk they carry if tender-driven prices surge.

In this sector, the key issue is processing access, not mine count. The Payne Institute says waste-to-market flowsheets and modular domestic plants offer the fastest path to resilience. OEMs and major contractors are now funding refinery upgrades. They are also paying for alloy approvals and helping expand powder-metallurgy capacity close to end-use markets. The higher unit cost is accepted because it cuts schedule delays and helps avoid compliance problems.

China, Russia and responses from the US/EU/UK/Japan/Australia

China's tightening grip on strategic materials through an expanded export licensing system now covers more than just rare earths, and has been applied to metals like gallium, germanium and graphite. The commerce ministry has built these measures into a licensing system that shows Beijing intends to use minerals as a bargaining tool. Analysts note the effect is to protect China's pricing power and keep its influence over the midstream, where it still holds the dominant position.

Western governments are also becoming tougher in their approach. In July 2025, the European Parliament backed a resolution that pushes for faster domestic projects, closer sourcing with allies and stronger oversight of supply risks. This creates the political ground for new funding and easier permitting across the bloc. The US is combining stockpiling with efforts to build up its own processing capacity. Agencies and industry groups have stressed that the real weakness lies in midstream processing rather than in geology. Australia and its partners are also putting money into joint projects to widen refining and alloy production in trusted locations.

For now, China maintains the upper hand because of its lead in processing and its power to change licensing rules with little warning. Minerals policy is likely to show up in broader trade talks and in arguments over standards. Market pressure is being shaped as much by paperwork and approval timelines as by the amount of ore in the ground.

Who benefits and what does it mean?

The producers most likely to benefit are those able to turn alumina or titanium waste into scandium oxide that can be audited. Buyers are putting value on clear provenance and steady supply.

Refiners and alloy shops in countries seen as reliable are in line to gain, but only if they can get through the slow defence and aerospace sign-off process. Those that succeed will sit at the most critical points in the chain and be first in line when airframe and engine builders lock in contracts. Governments that cut permit delays and guarantee grid hookups will attract all the business. Investors will only back projects when they can see that plants will start when agreed and keep running without interruptions.

KCSGI is seeing buyers place a higher value on material that comes with a clear, verified trail. Contracts are shifting and many now include take-or-pay terms or step-in rights. At the same time, suppliers are being asked to provide solid evidence for their ESG claims. Major manufacturers are also tightening their purchasing rules, and this gives an edge to processors that complete alloy and powder certification close to where the parts will actually be used, instead of sending material abroad and facing delays or repeat testing.

Conclusion

Scandium has moved from being treated as a by-product to becoming a bargaining chip in wider power struggles. The real issues are not in the mines but in the processing plants, and the contracts that turn raw ore into alloys that buyers will accept. Governments face pressure to build more midstream capacity and to cut down on the time it takes for materials to be certified. For companies, the priority is for supply they can prove and defend under audit. Some are spreading exposure across several partners to avoid being tied to one source. Others are willing to pay more if it means stable delivery over the long term. The control of scandium does not come from owning ore deposits. It comes from controlling the plants that refine the material and the approval systems that qualify it for use. In that sense, China is still king. Western buyers, however, are starting to place more value on proof of origin and access to processing than on the raw tonnage. Producers that can show steady, auditable output will hold the advantage in a market where even a few tonnes can move prices and shift bargaining power.

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