



Understanding the \$155 Million National Labs Steel Project: Why It Matters

Tasking the right people for a job leads to organizational excellence.

The Department of Energy recently announced \$155 million in funding for two interconnected projects that could reshape American steelmaking. Here's what they're about and why they're important.

The Challenge We're Facing

Making steel from raw iron ore via blast furnace (basic oxygen process) produces massive amounts of CO₂ — anywhere from 1.8 to 3.0 tonnes of greenhouse gases per tonne of steel produced. That's more CO₂ than steel! The World Steel Association reports that global steelmaking averaged about 2.18 tonnes of CO₂ per tonne of steel in 2024.

The good news? Electric arc furnaces using recycled scrap produce only about 0.2 tonnes of CO₂ per tonne of steel—roughly 90% less emissions. But there's a catch: as we rely more heavily on recycled scrap, we're building up contamination from “tramp elements” like copper, nickel, chromium and tin. These residual metals degrade steel quality and limit what applications the finished product can serve.

Why Copper Contamination Matters

In traditional blast furnace steelmaking, roughly 75% of the metal comes from pure iron ore, which naturally dilutes any contaminants in the 25% scrap portion. This kept residual copper levels low enough for high-quality applications. For example, premium cold-heading steel required maximum copper content of just 0.15-0.20%, while lower-grade structural steel could tolerate up to 0.40% copper.

Today, there are no blast furnace operations producing bar products for machining in the United States. We've shifted almost entirely to electric furnaces fed by scrap — which means we're fighting an uphill battle against accumulating contamination.

The Two-Part Solution

The National Library for Iron Ore and Scrap will create a comprehensive database characterizing available ores and scrap materials by geography and chemistry. Think of it as taking a page from Japan's industrial planning playbook. By mapping what materials are available where and establishing

Tariffs, Clean Steel, and the Way Forward

The United States pays higher prices for steel than Europe, China and most other countries. We make steel using the electric arc furnace (EAF) process, which relies on recycled scrap metal. However, some manufacturing operations require virgin steel made from iron ore in a blast furnace then refined to steel in a basic oxygen furnace (BOF), instead of recycled steel from scrap in an EAF. These operations include crimping, swaging and other processes that involve heavy cold working of the metal.

For America to become steel independent, we need better technology to purify our EAF steel until it matches the properties of BOF steel. Import tariffs on foreign steel make this challenge harder to solve. Some steel grades are no longer produced in the United States at all. For example, 12L14 steel must now be imported. Machine shops import this steel and pay tariffs not because foreign steel is cheaper, but because these grades simply cannot be made here anymore.

Projects like this one will strengthen our supply chain by improving the quality of EAF steel. Better quality could reduce our dependence on foreign steel. However, building enough steel production capacity to meet annual U.S. demand will require massive investments in both time and infrastructure. The steel industry needs long-term policy commitments that provide a stable foundation for growth. Steel plants cannot be built quickly. These commitments must have broad support that extends across multiple presidential administrations and bridges political divisions.

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national analytical standards, we can help steel producers avoid costly mismatches between local scrap supplies and their quality requirements. (I've personally seen locations where scrap contained unexpectedly high tin levels — these surprises can derail entire operations.)

The Tramp Element Removal Innovation (TERI)

Incubator addresses an even tougher challenge: developing technologies to actually remove copper and other contaminants from steel production. Currently, except for magnetic sorting of solid materials, no effective removal technologies exist. This incubator will explore



innovations across the entire steelmaking process — from scrap preprocessing through final product treatment.

Why This Matters Now

Without breakthrough decopperization technologies, we'll gradually poison our scrap stream until recycled steel can't meet quality standards for demanding applications. We're

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already seeing similar problems in brass recycling, where contamination from non-leaded brass interferes with traditional machining grades.

These projects represent essential infrastructure for a post-blast-furnace world — one where we can maintain both environmental responsibility and the high-quality steel products our economy depends on. [P](#)

References & Sources

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