

# CLIMATE TRACE ERS Spotlight

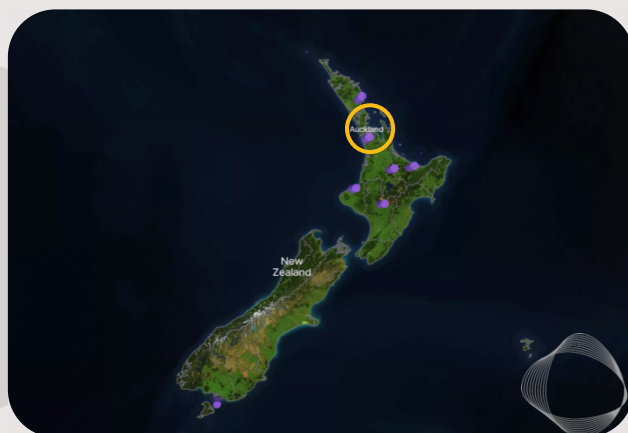
## Electric Arc Furnaces for Steel Production

**Glenbrook Steel Mill**, Auckland, NZL  
*650,000 tonnes of steel annually*

Manufacturing

### Annual Emissions Reduction Potential

- Total Project Impact: 1 MtCO<sub>2</sub>e
- ERS Global Potential: 47 MtCO<sub>2</sub>e



## How Electric Arc Furnaces Reduce Emissions

**Existing Practice:** Conventional integrated steel production via the blast furnace – basic oxygen furnace (BF-BOF) route emits roughly 1.5–2.1 tonnes of CO<sub>2</sub> per tonne of crude steel produced, primarily because coking coal is used both to provide energy for high-temperature process heat and to chemically reduce iron ore. This process is extremely energy- and carbon-intensive.

**A Potential Solution:** Electric arc furnaces (EAFs) use electricity to melt scrap steel, enabling mills to replace much of the coal-based Basic Oxygen Furnace (BOF) process. When powered by renewable energy, EAFs can significantly reduce the emissions associated with the BF–BOF route while maintaining high-quality steel output. More than one-third of the world’s blast furnace plants will be “re-lined” in the next 5 years, which could lock in 16 BtCO<sub>2</sub>e over the next 30 years. Instead of relining, facilities can transition to full electric production.

## New Zealand Steel Cutting 50% of Emissions

Glenbrook Steel Mill, operated by New Zealand Steel, is the country’s only fully integrated steel producer. The mill produces around 650,000 tonnes of steel each year, supplying New Zealand’s domestic market. The plant uses coal-based process to reduce local ironsand into molten iron using rotary kilns and melters, similar to direct-reduced iron (DRI) production, followed by refining to steel in a Basic Oxygen Furnace (BOF). An investment of \$300 million, supported by Government Investment in Decarbonising Industry (GIDI) co-funding, to install an electric arc furnace (EAF) will replace half of its coal-based ironmaking. A 30 MW renewable-energy supply agreement with Contact Energy delivers the required power via New Zealand’s national grid which is approximately 90% renewable. Once operational in 2026, the project is expected to cut annual emissions by up to 1,000,000 tonnes of CO<sub>2</sub>.



*Credit: New Zealand Steel*

### Impact of this project (tonnes CO<sub>2</sub>e/year)

Reduced at this location	1,000,000
Reduced outside this location*	No change
<b>Total reduced</b>	<b>1,000,000</b>

*\*No additional details*

**This solution of renewable-powered EAF steelmaking lowers emissions at the source vs. traditional steelmaking and avoids electricity-related emissions through a renewable PPA and low-emitting grid.**

**Note:** Source-level future annual emissions reduction potential is estimated by New Zealand Steel. This spotlight was prepared in December 2025 using publicly available information. To learn more about Emissions Reduction Solutions (ERS) in the iron and steel sector, please [visit our website](#), [read our white paper](#), or [contact the Climate TRACE partnerships team](#).