

Baotou 500,000 Tons/Year Water Slag and 500,000 Tons/Year Steel Slag Solid Waste Resource Utilization Project

Industrial solid-waste recycling into low-carbon cementitious materials and metal concentrates

<div>Total Investment</div> <div>RMB 304.725 million</div> <div>Feasibility study</div>	<div>Annual Processing Capacity</div> <div>500,000 tons water slag + 500,000 tons steel slag</div> <div>Design capacity</div>	<div>Full Production Year Operating Revenue</div> <div>RMB 221.0353 million</div> <div>Feasibility study Appendix 4</div>
<div>After-tax Project IRR</div> <div>59.46%</div> <div>Base scenario, feasibility study</div>	<div>After-tax Static Payback Period</div> <div>2.90 years</div> <div>Base scenario</div>	<div>After-tax NPV</div> <div>RMB 375.733 million</div> <div>Base scenario</div>

Project Overview

The project is located in the Industrial Park of Kundulun District, Baotou, approximately 5-10 kilometers from the Baogang plant area. It plans to process 500,000 tons per year of blast furnace water slag and 500,000 tons per year of steel slag. The core process adopts a dual-line parallel, terminal convergence route: water slag ultra-fine grinding, steel slag physical field combined separation, and tailings preparation of low-carbon cementitious materials. The product structure includes cementitious materials, iron concentrate, rare earth concentrate, other valuable metal concentrates, and solid waste treatment income. Total investment is RMB 304.725 million, with proposed financing of RMB 210 million and capital of RMB 94.725 million. The project is currently at the feasibility study and financing stage, with key separation technology requiring pilot verification and raw material supply and product sales agreements still to be formalized.

Technology & Competitive Edge

- Dual-line process combines water slag ultra-fine grinding and steel slag physical separation with tailings-based cementitious materials.
- Produces S105 grade ultra-fine slag powder with target specific surface area not less than 500m²/kg.
- Closed-loop recovery: first extract rare earth, then metals, tailings make building materials.
- DC RF dielectric separation for rare earth recovery requires pilot verification and performance assessment.

- Conventional grinding and magnetic separation have application foundation; dielectric separation is less mature.

Market & Business Model

- Revenue driven by cementitious materials (63.7%), iron concentrate (18.1%), and solid waste treatment income (18.1%).
- Rare earth and other valuable metal concentrates contribute 0.1% of revenue but offer high-value optionality.
- Cementitious materials target high-performance concrete admixtures, geopolymer building materials, and green low-carbon engineering markets.
- Products require customer trials, certification, and stable supply verification before commercial scaling.
- Policy support encourages steel slag utilization and recovery of valuable components from smelting slag.

Scope of Works & Project Status

- Construction includes land, design, EIA, energy assessment, equipment procurement, and installation.
- Phased disbursement recommended: first phase for land and design; second for contracts and supply agreements.
- Third phase conditional on completion, commissioning, pilot testing, and environmental facilities.
- Fourth phase conditional on trial production, continuous operation, and sales order verification.
- Current status: feasibility study completed; pilot testing, supply agreements, and sales contracts pending.

Key Financials

Total Investment	RMB 304.725 million
Proposed Financing	RMB 210 million (68.91% of total investment)
Capital	RMB 94.725 million
Full Production Year Operating Revenue	RMB 221.0353 million
Full Production Year Net Profit	RMB 154.9147 million
After-tax Project IRR (Base)	59.46%
After-tax Static Payback Period (Base)	2.90 years
Comprehensive DSCR	2.77
Downside After-tax IRR	29.4%

Investment Highlights

- Strong policy adaptability: aligns with national solid waste resource utilization and green building material policies.
- Regional synergy: located 5-10 km from Baogang plant area, reducing transportation costs and enabling industrial chain collaboration.
- Diversified product structure reduces single-product dependence and enhances revenue resilience.
- Under downside scenario (no subsidies, lower prices, higher costs), after-tax IRR remains positive at 29.4% and DSCR above 1.0x.

Key Risks

- Technology scale-up risk: DC RF dielectric separation requires pilot verification; concentrate grade and continuous operation not yet proven.
- Product sales and market introduction risk: cementitious materials need customer certification and stable supply verification; iron concentrate pricing and payment collection cycles need validation.
- Raw material supply and policy subsidy risk: supply agreements not yet formalized; policy subsidies lack independent verification of cashing basis.

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