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Business Plan

2 Million Tons/Year Coal Gangue Solid Waste Resource Utilization Project in Tumend Right Banner, Baotou, Inner Mongolia

Chapter 1: Executive Summary

Project Name: 2 Million Tons/Year Coal Gangue Solid Waste Resource Utilization Project in Tumend Right Banner, Baotou, Inner Mongolia

Construction Location: Tumend Right Banner, Baotou, Inner Mongolia Autonomous Region (covering 172.33 mu)

Project Positioning: Relying on world-advanced patented technologies such as physical field mineral separation and supercritical thermal cracking, conduct high-value-added, large-scale, full-component resource utilization of industrial solid waste (coal gangue) generated from coal mining, building a circular economy green industry benchmark.

Construction Content and Scale: Construct 5 modern production workshops and supporting facilities, with annual coal gangue processing capacity of 2 million tons. In full production year, can produce 240,000 tons of clean coal, 370,500 tons of kaolin, 900,000 tons of mineral soil conditioner, 102,000 tons of mullite, 127,500 tons of flint clay and other high value-added products.

Investment and Financial Overview: Total project investment RMB 1,280.8966 million, including enterprise self-financing RMB 425.0486 million (33.18%), proposed bank loan RMB 855.848 million (66.82%). Full production year operating revenue RMB 1,244.30 million, net profit RMB 598.7042 million. Project after-tax financial internal rate of return (FIRR) reaches 43.35%, after-tax static investment payback period 3.17 years (including construction period).

Chapter 2: Industry Background and Market Analysis

2.1 Industry Pain Points and Policy Opportunities

China is a major coal country, with annual coal gangue generation of approximately 829 million tons and cumulative stockpile exceeding 6 billion tons, not only occupying large amounts of land but also causing serious air and groundwater pollution. Currently, domestic comprehensive utilization rate of coal gangue is only about 30%, and it is mostly used in low-value-added fields such as brick-making and power generation.

This project highly aligns with the policy orientation of "comprehensive utilization rate of bulk solid waste reaching 60%" and "supporting large-volume, large-scale, high-value utilization" in the national "14th Five-Year Plan for Circular Economy Development" and "Carbon Peak Action Before 2030". It belongs to the encouraged category in the "Industrial Structure Adjustment Catalogue", enjoying significant policy dividends.

2.2 Broad Target Market Space

Through the "full utilization" process, this project produces multiple products with high market demand:

- **Kaolin:** National annual consumption about 7.5 million tons, with 800,000-1.1 million tons needing to be imported annually, mainly used in ceramics, papermaking, coatings and other fields, with huge import substitution space.
- **Mullite and Flint Clay:** As high-end refractory materials, national refractory product output exceeded 22 million tons in 2024, with strong export demand and high-alumina refractory raw materials in short supply.
- **Mineral Soil Conditioner:** National potential demand about 30 million tons/year, with important strategic significance for saline-alkali land management and mining area ecological restoration.
- **Clean Coal:** Baotou and surrounding areas as heavy industry bases have local clean coal demand of over 20 million tons/year.

Chapter 3: Core Technology and Product Plan

3.1 Core Technology Barriers

This project abandons the traditional extensive utilization model and adopts the technical route of "full-component separation + deep processing":

1. **Physical Field Mineral Separation Technology:** Through intelligent photoelectric sensing and high-precision spiral chute gravity separation, efficiently separate clean coal, iron-titanium impurities, and silica-aluminous raw materials.
2. **Supercritical Thermal Cracking and Magnetic Separation Impurity Removal Technology:** Using 3T high-intensity magnetic separation and thermal cracking, deeply

remove iron and purify silica-aluminous raw materials to produce high-quality (coating grade, ceramic grade, electronic grade) kaolin.

3. **High-Temperature Synthesis and Calcination Technology:** Using 1500-1600°C high-temperature tunnel kiln, wet co-grind kaolin and bauxite to synthesize mullite (phase content $\geq 70\%$); calcine at 1300-1400°C to produce flint clay.

4. **High-Pressure Activation and Compounding Technology:** Using silica-aluminous tailings compounded with agricultural waste and microbial agents, prepare multi-functional mineral soil conditioner through high-pressure activation.

3.2 Full Production Year Product Plan

Product Name	Annual Output (tons)	Target Market/Use	Estimated Unit Price (RMB/ton)	Annual Output Value (RMB)
Clean Coal	240,000	Industrial fuel, power generation	450	10,800
Kaolin	302,500	Papermaking, coatings, electronics	600	22,230
Mineral Soil Conditioner	100,000	Land restoration, agricultural yield increase	280	25,200
Mullite	102,000	High-end refractory materials	4,000	40,800
Flint Clay	127,500	Refractory materials	1,600	20,400
Ferric Oxide and Titanium Dioxide	40,000	Pigments, metallurgy	850	3,400
Gangue	200,000	Building aggregate	80	1,600
Total	1,980,000	—	—	124,430

Chapter 4: Site Selection and Construction Conditions

The project is located in the New Industrial Park of Tumed Right Banner, Baotou, Inner Mongolia Autonomous Region, covering 172.33 mu. This location has unique advantages:

- 5. **Abundant Raw Materials:** Tumed Right Banner is located in the hinterland of the Hohhot-Baotou-Ordos "Golden Triangle", with extremely rich coal resources in the northern Daqingshan area, dense surrounding coal mines, stable coal gangue raw material sources, and extremely low transportation costs.
- 6. **Convenient Transportation:** Beijing-Lanzhou Railway, G6 Beijing-Tibet Expressway, and National Highway 110 cross the territory, forming a convenient and smooth three-dimensional transportation network, facilitating bulk solid waste and product throughput.
- 7. **Complete Supporting Facilities:** The industrial park has achieved "seven supplies and one leveling", with abundant Yellow River annual water intake and developed regional power grid, fully guaranteeing the project's water and electricity demand for production.

Chapter 5: Operation Model and Implementation Schedule

5.1 Organizational Structure and Team

The project company implements a general manager responsibility system, with Production Department, Technology Department, Marketing Department, Operation Department, Finance Department, etc. The total factory workforce is 270 people, including 60 technical and management personnel. The company establishes a complete DCS distributed control system to achieve full-process automated production.

5.2 Implementation Schedule

The project construction period is planned as 12 months:

- **Month 1:** Preliminary work (project approval, survey, design).
- **Month 2:** Construction preparation and bidding.
- **Months 3-11:** Engineering construction, equipment procurement, installation and commissioning.
- **Month 12:** Completion acceptance and trial production.

Chapter 6: Financing Plan and Financial Benefits

6.1 Fund Demand and Use

Total project investment RMB 1,280.8966 million. Including construction investment RMB 1,241.64 million (construction RMB 271.4148 million, equipment RMB 691 million, installation RMB 101 million, other and reserve funds RMB 178.2252 million), initial working capital RMB 20 million.

Propose to apply for medium and long-term fixed asset loans of RMB 855.848 million from banks, with a loan term of 5 years, mainly used for equipment procurement and engineering construction.

6.2 Profit Forecast and Debt Solvency

After the project reaches full production, financial performance is extremely excellent:

- **Strong Profitability:** Full production year net profit RMB 598 million, gross margin over 67%, net margin 48.71%. Return on Investment (ROI) is 63.89%.
- **Abundant Cash Flow:** Average annual net cash flow during operation period exceeds RMB 600 million.
- **Extremely Strong Debt Repayment Guarantee:** During the loan period, average Interest Coverage Ratio (ICR) is as high as 27.77, average Debt Service Coverage Ratio (DSCR) is 2.60, indicating that the cash flow generated by the project is completely sufficient to cover bank principal and interest.

Chapter 7: Risk Control

8. Market and Price Risk: Product price fluctuation is the most sensitive factor for the project. Countermeasures: The project has rich product lines with strong anti-cyclical ability; lock in prices by signing long-term purchase and sales agreements with large downstream refractory material factories and ceramic factories.

9. Technology and Operation Risk: Long process flow and complex equipment. Countermeasures: Core equipment adopts mature patented technology, introduces DCS automated control; core technical team has rich experience in solid waste treatment and inorganic non-metallic material R&D.;

10. Environmental Compliance Risk: Countermeasures: The project itself is an environmental solid waste treatment project, and the production process adopts closed-loop circulating water system, high-temperature flue gas bag dust removal and other measures to ensure all emission indicators are superior to national standards.

Chapter 8: Conclusion

Based on the national "Dual Carbon" strategy and circular economy policy, this project transforms low-value coal gangue into high-value new materials. The project has advanced technology, broad market, significant economic benefits, and extremely strong debt solvency, combining extremely high commercial value and social environmental benefits. We sincerely request your bank to provide credit support and jointly create a new chapter in the green economy.

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