



**GEODYN**  
SOLUTIONS

**MONGOLIA CRITICAL  
MATERIALS  
& CARBON  
INNOVATION HUB**



# EXECUTIVE SUMMARY

Geodyn Solutions proposes an integrated \$800 million initiative in Mongolia that combines Rare Earth Element (REE) extraction, coal gasification, activated carbon production, and advanced carbon product development. This vertically integrated project positions Mongolia as a leader in critical mineral supply, clean coal transformation, and high-tech carbon materials while delivering exceptional returns, job creation, and environmental stewardship.

# PROJECT COMPONENTS

## RARE EARTH ELEMENT EXTRACTION FACILITY (\$500M CAPEX)

- Extraction from mineral ores and coal ash.
- Annual output: 12,000 metric tons of REE oxides.
- REEs: Nd, Pr, Dy, Tb, La, Ce, Y.
- Export-ready purity levels with downstream separation.



## COAL GASIFICATION PLANT (\$150M CAPEX)

- Converts coal into syngas for internal power, hydrogen, methanol, and ammonia.
- 50 MW equivalent capacity.
- Supports energy independence and chemical diversification.

## ACTIVATED CARBON PRODUCTION UNIT (\$50M CAPEX)

- Converts residual coal into activated carbon.
- Applications: water purification, air filtration, gold recovery.



# PROJECT COMPONENTS

## **ADVANCED CARBON MATERIALS LAB & PRODUCTION** **(\$60M CAPEX)**

Produces graphene, carbon foam, battery-grade carbon.  
Supplies high-value sectors like EVs, electronics, and aerospace.



## **SHARED INFRASTRUCTURE & LOGISTICS** **(\$40M CAPEX)**

Includes roads, transport terminals, power grid  
connections, water systems.



**TOTAL OPERATING  
EXPENSES (OPEX):  
\$130 MILLION/YEAR**

- Labor, chemicals, maintenance.
- Utilities (recycled water, syngas-based power).
- Export logistics and environmental monitoring.

## FINANCIAL PROJECTIONS

METRIC	STANDALONE REE	Integrated Model
Total CAPEX	\$500M	\$800M
Annual Revenue	\$250-350M	\$500-700M
Payback Period	~5 years	~4 years
IRR	22-28%	30-35%
<b>NPV (10% discount, 20 yrs)</b>	<b>\$1.2B</b>	<b>\$2.1B</b>

# JOB CREATION & LOCAL DEVELOPMENT



<b>CATEGORY</b>	<b>JOBS CREATED</b>
REE Processing	1,000
Gasification & Chemicals	300
Activated Carbon	250
Carbon Materials	200
Logistics & Services	2,500+
<b>Total</b>	<b>4,250+</b>

- Training partnerships with Mongolian universities.
- Technology transfer and upskilling programs.
- Local procurement and SME development.



## ENVIRONMENTAL & ESG COMMITMENTS

- Closed-loop water and dry stack tailings.
- Bioremediation using Geodyn's microbial formulations.
- Carbon credit generation through circular coal use.
- Transparent reporting and community consultation.
- Compliance with EU, U.S., and Asian ESG standards.



## EXPORTABLE PRODUCTS & MARKETS

- REE oxides for magnets, EVs, wind turbines.
- Syngas derivatives (methanol, ammonia, hydrogen).
- Activated carbon for Asia-Pacific markets.
- Graphene and battery materials for U.S., Japan, EU.
- Carbon credits for global ESG buyers.

# STRATEGIC PARTNERSHIPS

- Targeted offtake agreements with EV and renewable tech companies.
- Collaborations with international development banks and carbon funds.
- Joint ventures for tech deployment and R&D.





The Mongolia Critical Materials & Carbon Innovation Hub presents a globally unique opportunity to combine sustainable mining, clean energy production, and advanced materials manufacturing. Geodyn Solutions invites government partners, global investors, and strategic buyers to collaborate in shaping the future of critical supply chains while boosting Mongolia's economy and environment.



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