TribOriGen

TURNING WASTE TIRES INTO DURABLE MATERIALS

Presented by **TribOriGen, TriChokro Automotives**

> Our vision is to lead the global transition to circular, high-performance infrastructure materials.

TribOriGen

The Core Problem: A World Drowning in Waste Tires

Environmental Catastrophe

- Millions of non- biodegradable tires discarded annually, accumulating in landfills and polluting ecosystems.
- Waste tires contribute to significant land degradation and harbor disease vectors.

Infrastructure Failure

- Conventional asphalt and rubber materials fail prematurely under heat and heavy loads.
- This leads to constant maintenance, high costs, and inefficient infrastructure.

Global Pollution: A Dual Threat

Air Pollution from Tire Burning

- **+37% CO, +24% SO_2, and +48% HCl in** cement kilns when burning tires.
- **~40.7% TPM** (Total Particulate Matter) from road paving processes.
- **PM_{10}** exposure can reach **~18,940 µg/m^3** in affected areas.

Ocean Pollution: Microplastics & Heavy Metals

- Tires contribute **5-10%** of global marine microplastics.
- **6 million** tonnes of tire particles are released each year
- Leaching harmful heavy metals such as **Zn, Pb, and Cu** into the environment.

The Bangladesh Context: A Local Crisis

- Approximately **150,000** tons of waste tires are generated annually.
- Widespread dumping and burning practices intensify local air and water pollution.
- Dense traffic and extreme weather conditions accelerate road
- deterioration, necessitating frequent and costly repairs.

Bridging the Gap: What's Missing Today

Environmental Harm

Uncontrolled tire dumping and burning lead to severe environmental degradation and
public health risks.

High Maintenance Costs

Conventional road and rubber materials offer limited durability, resulting in premature failure and expensive upkeep.

Lack of Integration

Absence of a comprehensive system to transform waste tires into high-performance, durable, and self-healing materials.

OriGen's Solution: A Circular Approach

Waste Reduction

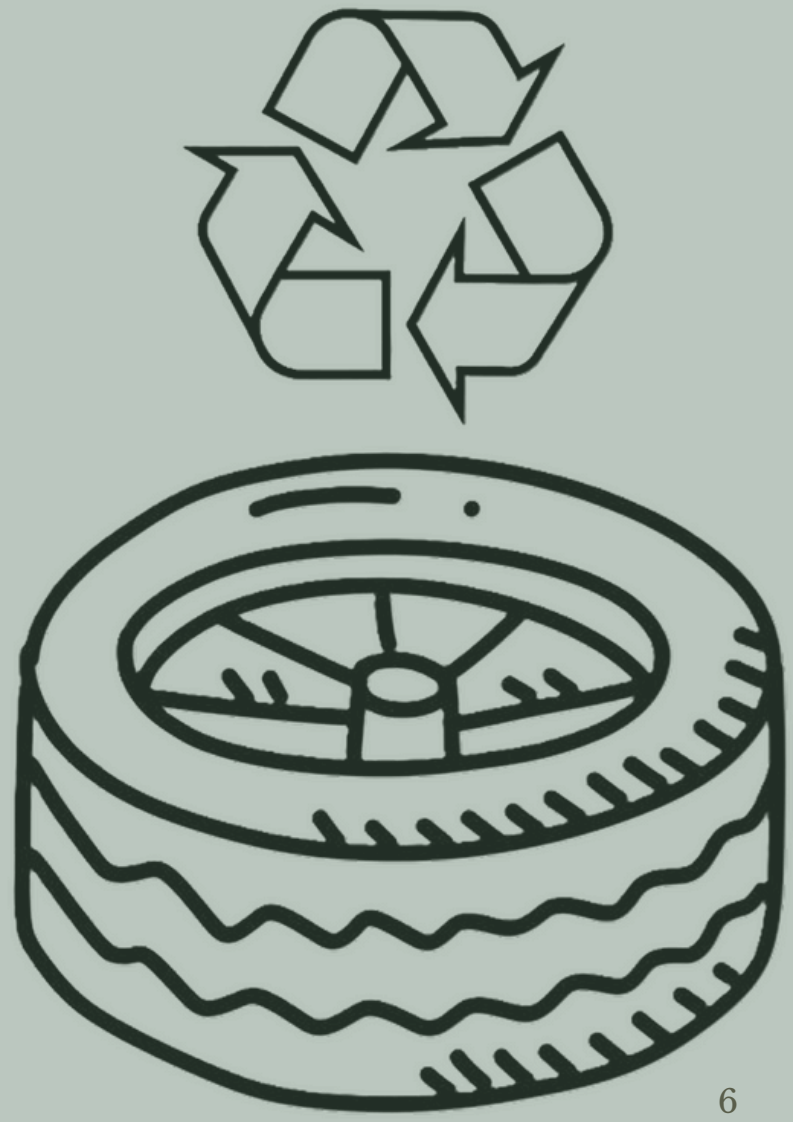
Utilizing Ground Tire Rubber (GTR) significantly reduces landfill burden and pollution.

Enhanced Durability

Producing rubberized asphalt and elastomers that are both durable and self-healing.

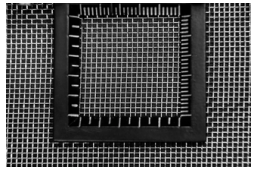
Integrated Impact

Simultaneously addressing waste accumulation, pollution, and material failure in infrastructure.



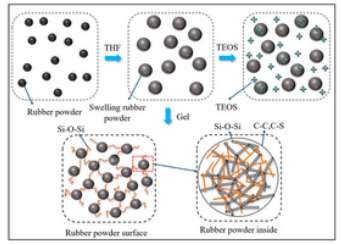
Technology Overview: From Waste to Resource

Tires are shredded into chips using a steel-capable unit.



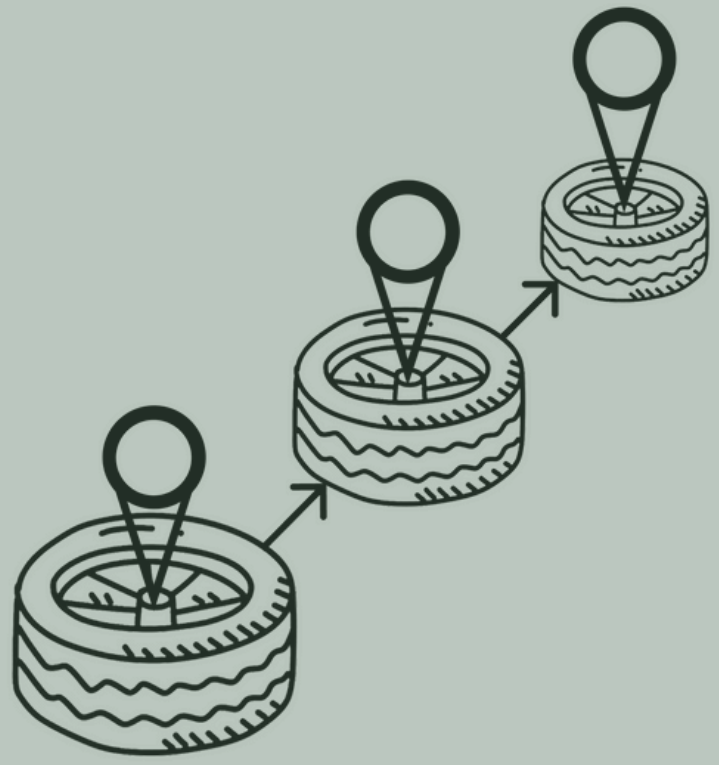
Chips are ground into 20–40 mesh granules with a hammer mill, and a magnetic separator removes steel and metallic contaminants.

Pan milling is used to apply intense shear and friction to partially break surface sulfur crosslinks in a controlled devulcanization process.



Mechanochemical activation results in a reactive, compatible rubber powder that blends well into bitumen or rubber mixes. This improves bonding and overall durability.

Final Product: tIre powder



Implementation Plan: A Roadmap to Impact

1

0-6 Months

Stabilization and proof of concept: establishing initial processes and validating technology.

2

Year 1

Equipment upgrades to achieve a production output of 3 tons/month of GTR.

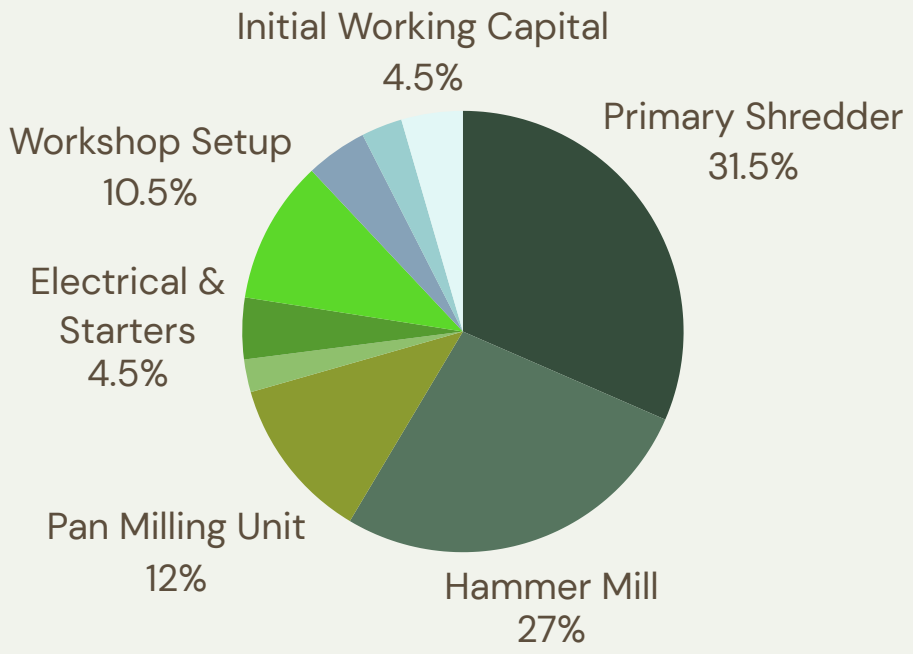
3

Year 2

Expansion of operations and specialized R&D to reach 4+ tons/month output and diversify applications.

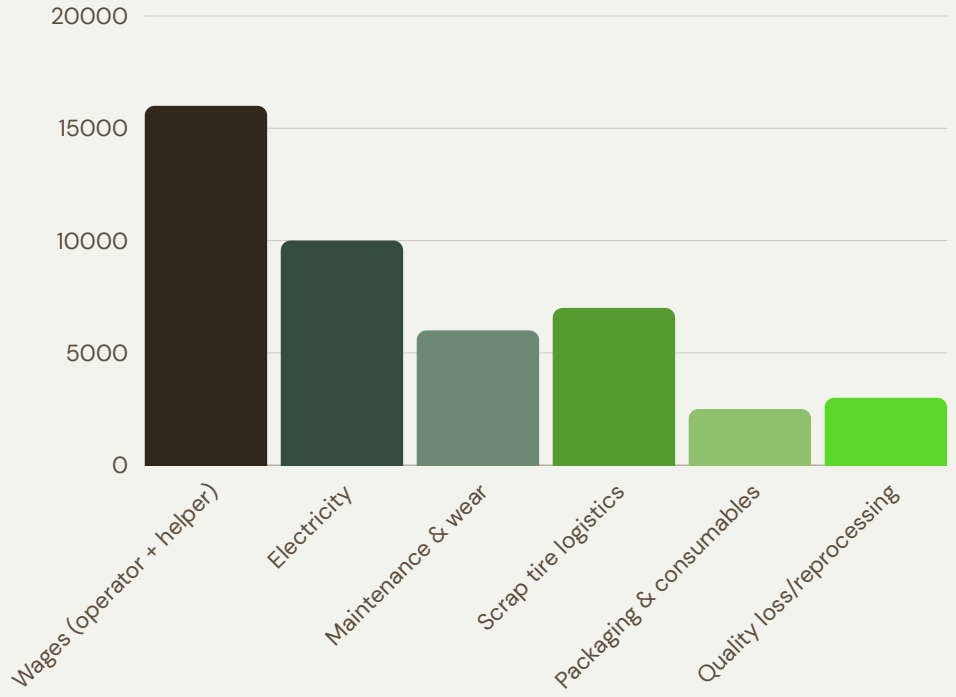
Cost Structure: Lean Operations, High Impact

Capital Expenditure (CAPEX)



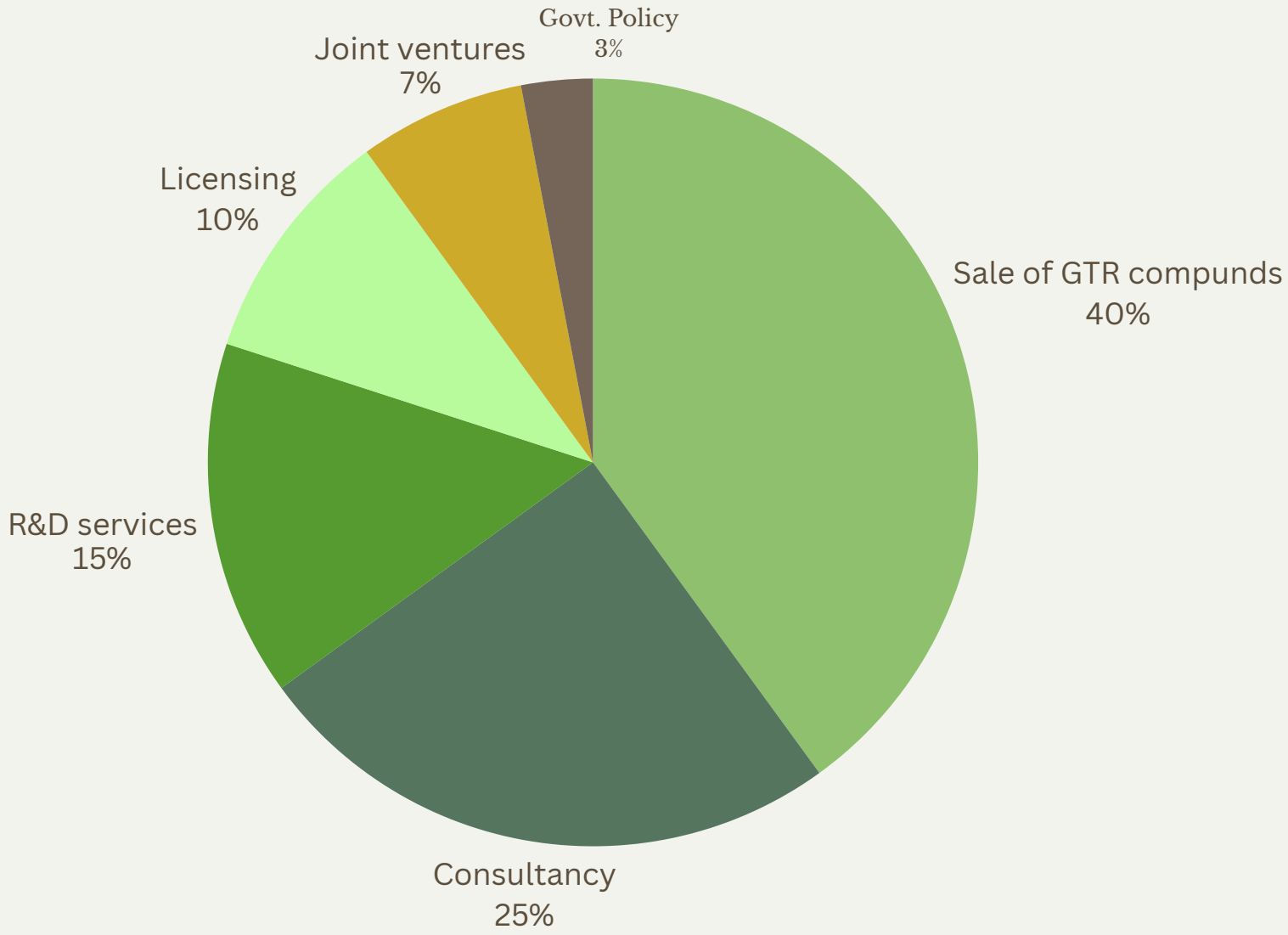
Total CAPEX: BDT 345,000 (~USD 2,875) for essential equipment.

Operational Expenditure (OPEX)

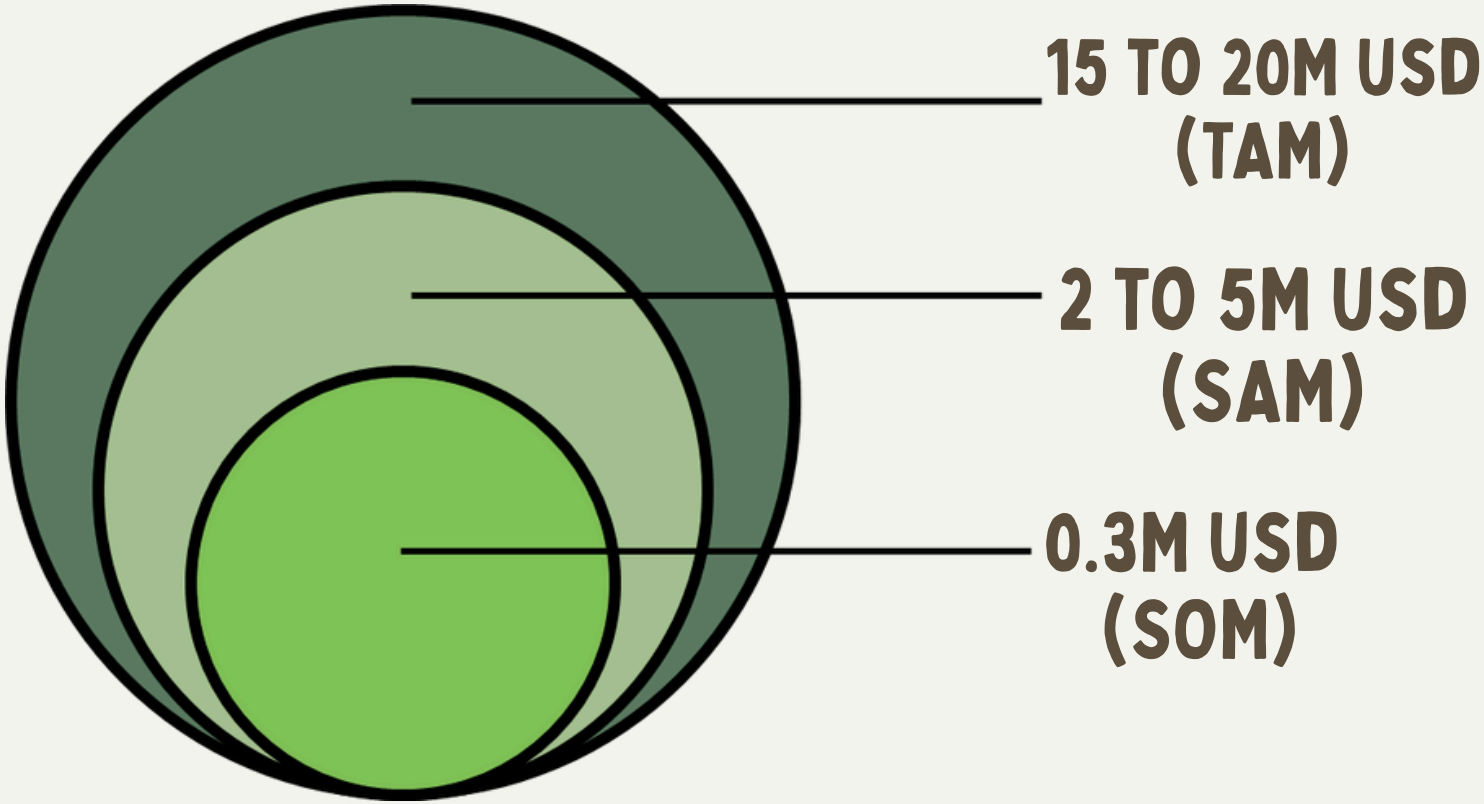


- Monthly OPEX: BDT 44,500 (~USD 364), ensuring efficient operations.
- Low-cost feedstock (waste tires) ensures attractive profit margins.

Diverse Revenue Streams



Significant Market Opportunity



The market for recycled rubber and GTR is substantial, with significant growth potential driven by policy and economic zone adoption.

Built for Scalability

Modular Setup

Low-capex and easily expandable.

Adaptable Applications

Versatile for roads, industrial rubber, and flooring.

Policy Aligned

Supports the circular economy and sustainable practices.

Urban Replicability

Easily deployable across various urban regions.

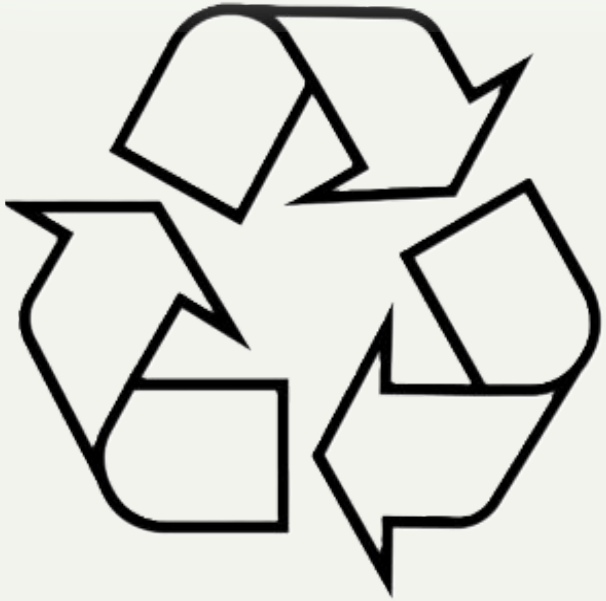
Environmental Impact

- Waste Diversion

  Diverts tires from landfills, significantly reducing pollution.

- Reduced Carbon

  Lowers embodied carbon and lifecycle material use.



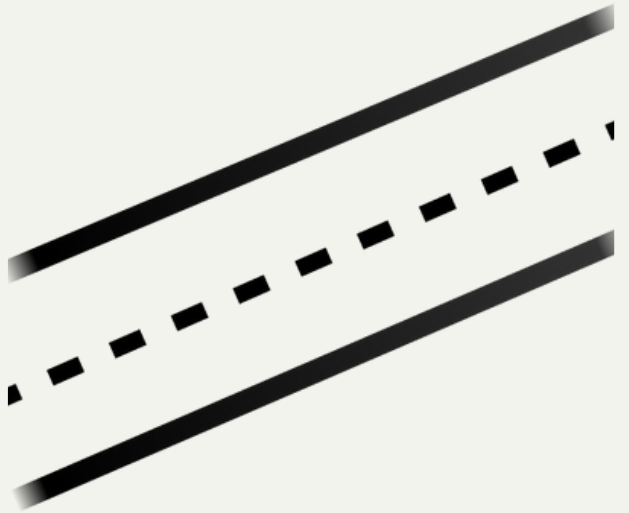
Infrastructure Benefits

- Extended Lifespan

  Improves road fatigue life, extending infrastructure durability.

- Reduced Repairs

  Self-healing materials decrease repair frequency.



Economic & Social Impact

Cost Reduction

Uses low-cost waste feedstock, reducing infrastructure costs.

Job Creation

Supports local employment and industrial growth.

Sector Value

Creates value in automotive, flooring, and construction sectors.

Next Steps for Growth

01

Pilot Deployment

Validate performance and refine processes.

02

Strategic Partnerships

Collaborate with infrastructure and industrial buyers.

03

Scale Production

Expand capacity and develop specialized formulations.

Thank You!

We appreciate your engagement and look forward to a sustainable future together.

References

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