# SYNTHETIC RED OXIDE

- *What if we could take the often-overlooked by-product of waste steel and convert it into valuable red oxide and calcium chloride? Our cutting-edge technology does just that, offering a sustainable solution that not only addresses environmental challenges but also drives economic growth in key industries.*

# SYNTHETIC RED OXIDE PROJECT

- *Red Oxide Production Facility*
- *Revolutionizing Waste Management and Resource Utilization in The UK & Europe*

# EXECUTIVE SUMMARY

Introduction

Vision

Mission

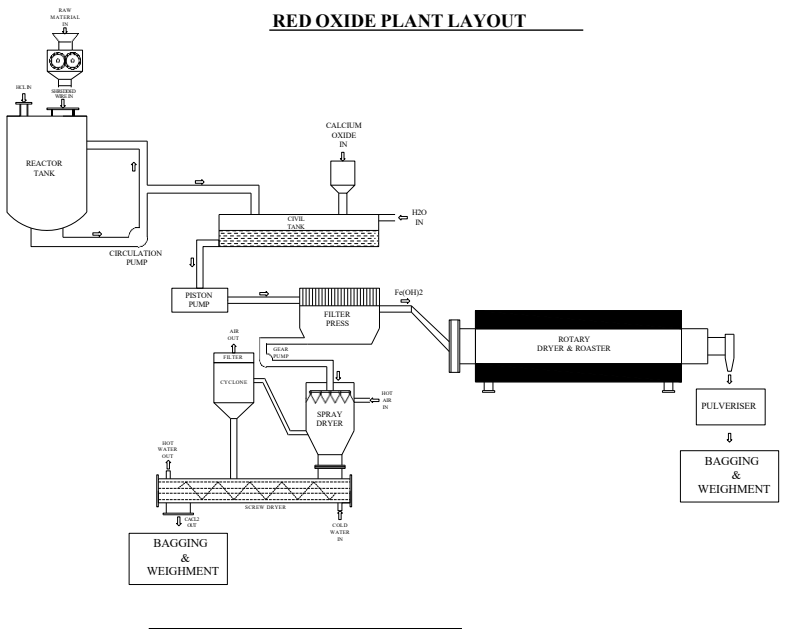

# EXECUTIVE SUMMARY - INTRODUCTION

- Our innovative technology transforms scrap tyre steel, often a challenging and undervalued byproduct, into high-demand synthetic red oxide and calcium chloride. This groundbreaking process not only addresses critical environmental concerns but also provides tyre recyclers with a sustainable and profitable solution. By leveraging this technology, recyclers can turn waste into valuable resources, boosting revenue and contributing to an eco-friendly, circular economy.
- Vision: To lead the transformation of waste materials into valuable resources, supporting a cleaner environment and a thriving circular economy.
- Mission: Establish a cutting-edge synthetic red oxide production facility that partners with tyre recycling operations. Using advanced processes, we will convert scrap tyre steel into high-quality products, delivering significant economic and environmental impacts.

# PROBLEM STATEMENT

- While waste tyre steel has value as it can be melted and reused, current recycling methods are inefficient and not widely implemented. Existing technologies struggle with the contamination from rubber and textiles, and the handling processes are not optimized to maximize recovery and quality. Despite these challenges, tire-derived steel is suitable for melting in Electric Arc Furnaces, offering potential for reuse if recycling processes are improved.

# SOLUTION




- Our proprietary process involves several steps to convert waste tyre steel into valuable red oxide and calcium chloride.

# RED OXIDE MANUFACTURING PROCESS

- The Red Oxide manufacturing process utilizes iron wire, a by-product of the tire pyrolysis unit, which is sold as scrap to iron melting furnaces at a very low cost. Using advanced technology, this process efficiently produces Red Oxide and Calcium Chloride.
- **Process Description**
- **Iron Wire Treatment**: The iron wires undergo a treatment process to produce Iron (II) chloride ($FeCl_2$). This initial treatment ensures that most impurities remain solid, facilitating their removal.
- **Filtration**: The solution is filtered to eliminate solid impurities, resulting in a clean green solution (filtrate).
- **Reaction with Calcium Oxide (CaO)**: The filtrate reacts with Calcium Oxide (CaO), producing Iron hydroxide ($Fe(OH)_2$) and soluble Calcium Chloride ($CaCl_2$). The reaction is exothermic and releases heat.
- **pH Adjustment and Separation**: The mixture is adjusted to a neutral pH and then separated using processes like decanting, settling, and filtration. The filtrate containing soluble $CaCl_2$ is dried in a spray dryer to yield $CaCl_2$ powder.
- **Washing and Drying**: The solid residue (Iron hydroxide) is washed to remove any remaining $CaCl_2$, then dried and heated to produce Red Oxide, which is non-magnetic, indicating the completion of the heating process.

# KEY NOTES

- **Hydrogen Utilization**: The process generates hydrogen (1000 kg of iron produces 35 kg of hydrogen), which can be used for roasting or spray drying, reducing fuel consumption.
- **First Filtration**: Uses a polypropylene filter cloth in a round High-Density Polyethylene (HDPE) vessel to separate soluble ferric chloride from insoluble impurities.
- **Calcium Oxide Quality**: High purity and fine powder form of Calcium Oxide (CaO) is essential for effective reaction with the acidic solution, producing insoluble Iron Hydroxide (Fe(OH)2) and soluble Calcium Chloride (CaCl2).
- **Exothermic Reaction**: The reaction with CaO is exothermic, requiring a reactor with a cooling jacket and robust stirring arrangement.
- **Filtration with CaO**: Iron Hydroxide filtration may need a press filter due to its gel-like consistency. CaO helps neutralize the solution's pH, resulting in Calcium Chloride (CaCl2) in the filtrate.

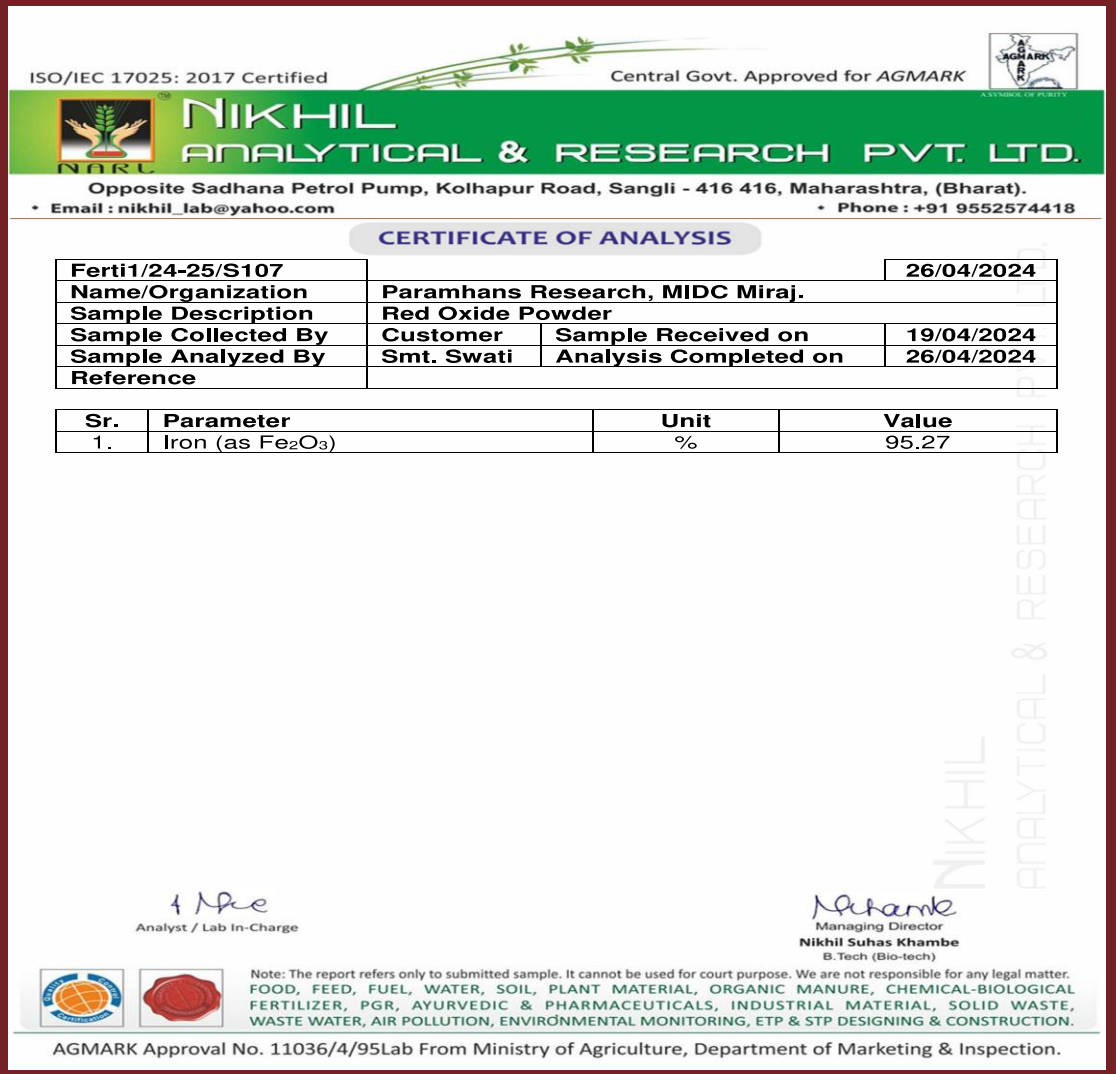
# CONTINUED

- **Spray Drying**: Post-filtration, spray drying converts the solution into solid Calcium Chloride (CaCl2) powder, with water recovery being crucial for washing Iron Hydroxide.
- **Drying and Roasting**: The dried and filtered Iron Hydroxide undergoes further drying and roasting in a rotary kiln, requiring adequate air passage and precise energy calculations.
- **Volume Calculations**: Accurate volume estimations, including water requirements for washing Fe(OH)2, are vital for process efficiency.
- **Heating Requirements**: The reaction generates sufficient hydrogen for heating purposes, supplemented by pyrolysis oil. External heating is needed only for the spray dryer and roasting stages.

# MARKET OPPORTUNITY CONTENT:

- The global red oxide market is poised for substantial growth, driven by increasing demand in the construction, paints, coatings, and ceramics industries. With our innovative technology, we aim to capture a significant share of this expanding market while addressing critical environmental issues associated with waste tyre steel.
- Red Oxide Market Overview
- Market Size & Growth: Expected exponential revenue growth at a significant CAGR from 2023 to 2030.
- Key Drivers: Increasing demand in building and industrial applications.
- Segmentation:
  - *By Type: Natural, Synthetic*
  - *By Application: Building, Industry, Others*
  - *By Geography: North America, Europe, Asia Pacific, Middle East & Africa, Latin America*
- Competitive Landscape: Major players include Tata Pigments, Golchha Oxides, BRITEX-ENTERPRISES, and others.
- Analysis: Includes market evolution, drivers, restraints, opportunities, trends, Porter's Five Forces, and value chain analysis.
- For detailed insights, visit: https://www.verifiedmarketreports.com/product/red-oxide-market/

# TEST REPORT



ISO/IEC 17025: 2017 Certified

Central Govt. Approved for *AGMARK*

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**CERTIFICATE OF ANALYSIS**

| | | | |
|---|---|---|---|
| **Ferti1/24-25/S107** | | | **26/04/2024** |
| **Name/Organization** | **Paramhans Research, MIDC Miraj.** | | |
| **Sample Description** | **Red Oxide Powder** | | |
| **Sample Collected By** | **Customer** | **Sample Received on** | **19/04/2024** |
| **Sample Analyzed By** | **Smt. Swati** | **Analysis Completed on** | **26/04/2024** |
| **Reference** | | | |

| Sr. | Parameter | Unit | Value |
|---|---|---|---|
| 1. | Iron (as $Fe_2O_3$) | % | 95.27 |

Analyst / Lab In-Charge

Managing Director
**Nikhil Suhas Khambe**
B.Tech (Bio-tech)

Note: The report refers only to submitted sample. It cannot be used for court purpose. We are not responsible for any legal matter.

FOOD, FEED, FUEL, WATER, SOIL, PLANT MATERIAL, ORGANIC MANURE, CHEMICAL-BIOLOGICAL FERTILIZER, PGR, AYURVEDIC & PHARMACEUTICALS, INDUSTRIAL MATERIAL, SOLID WASTE, WASTE WATER, AIR POLLUTION, ENVIRONMENTAL MONITORING, ETP & STP DESIGNING & CONSTRUCTION.

AGMARK Approval No. 11036/4/95Lab From Ministry of Agriculture, Department of Marketing & Inspection.

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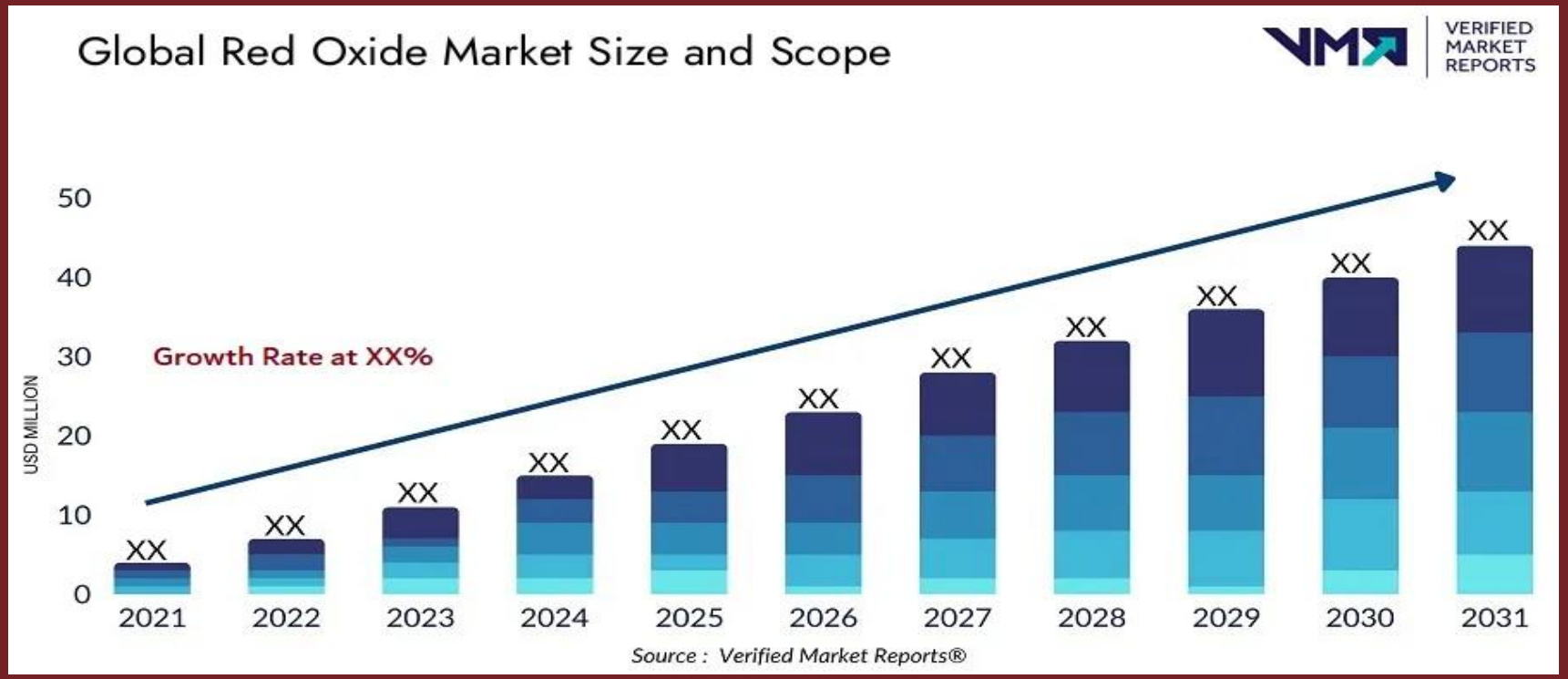
# BUSINESS MODEL

- Revenue Streams: Sale of red oxide, by-products.
- Pricing Strategy: Competitive pricing to penetrate the market.
- Distribution Channels: Direct sales to industries, partnerships with distributors.

# MARKET SIZE


Global Red Oxide Market Size and Scope
VERIFIED MARKET REPORTS
USD MILLION
50
40
30
20
10
0
Growth Rate at XX%
XX
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
Source : Verified Market Reports®

# CASH FLOW PROJECTIONS:

01

Year 1:

- Sales: £378,840
- Overheads: £309,525
- Raw materials: £225,579.2
- Loss: - £156,264

02

Year 2:

- Sales: £1,,955,126
- Overheads: £515,875
- Raw materials:£1,164,174
- Profit: £275,077

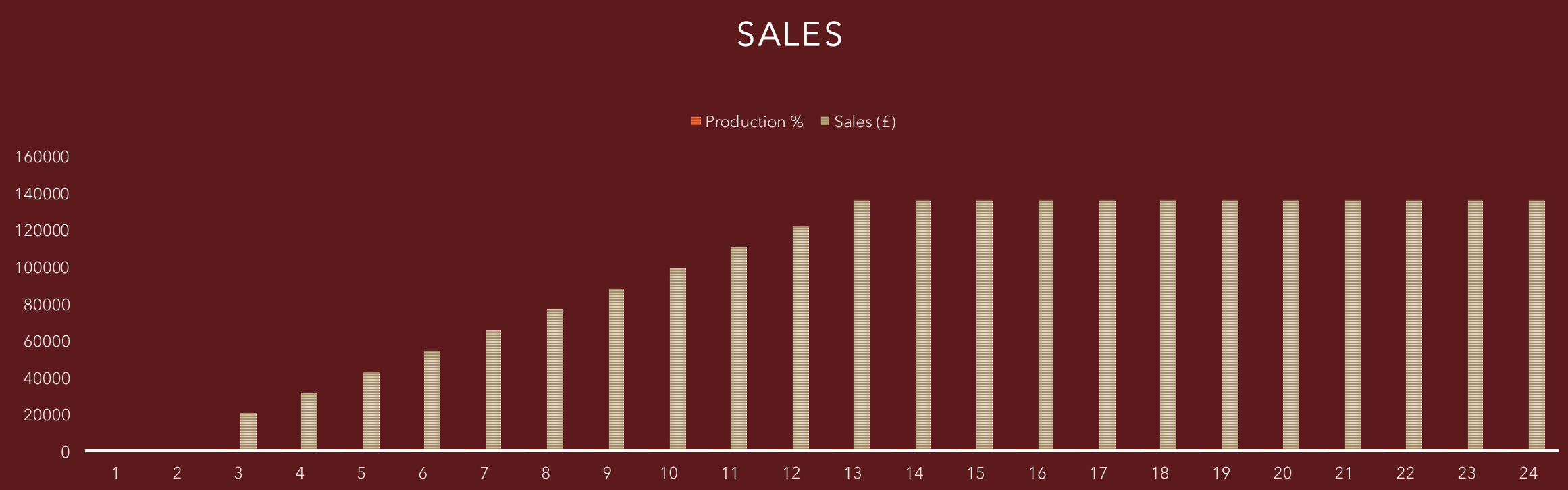
03

Break-even Analysis:Break-even point is projected at Year 2 with a net positive cash flow.

04

ROI: 40% when in full production from month 13

# SALES PROJECTION OVER 2 YEARS



# INVESTMENT OPPORTUNITY

- Investment & ROI
- We offer an attractive investment opportunity that combines sustainability with profitability. Our cutting-edge technology for converting scrap tire steel into high-demand synthetic red oxide and calcium chloride is designed to deliver rapid and significant returns.
- Key Highlights:
- Projected ROI: A return on investment of 49% within 24 months.
- Revenue Streams: Sales of synthetic red oxide and calcium chloride provide consistent cash flow and long-term profit potential.
- Sustainability Advantage: Investing in our facility supports eco-friendly practices and positions your business at the forefront of environmental innovation.
- Investment Proposal: We are ready to provide a detailed quotation upon confirmation of serious interest in partnering with our project. Join us in driving forward a sustainable, profitable future for tire recycling.

# TEAM

## EXPERT IN INDUSTRIAL PLANT SETUP AND SUSTAINABLE TECHNOLOGIES

- Kevin Thompson is a seasoned industrial engineer with a rich background in setting up and managing manufacturing plants across various industries. He has successfully established plastic extrusion plants, plastic injection molding facilities, and household detergent manufacturing units. Additionally, Kevin is at the forefront of recovered Carbon Black (rCB) enhancement technology, with a patent pending for an innovative process to remove ash from rCB.
- Kevin has run his own company for 10 years before moving to the UK to assist in setting up an rCB enhancement company. His expertise in project management and process optimization, combined with his commitment to environmental sustainability, positions him as an ideal leader to spearhead the establishment of a synthetic red oxide production facility anywhere in the world. His ability to transform raw materials into high-value products and his track record of operational excellence make him an asset in the pursuit of sustainable industrial solutions.