

# NIIR PROJECT CONSULTANCY SERVICES (NPCS)

*Asia's Leading Industrial Knowledge & Project Consultancy Ecosystem*

## CLIENT CASE STUDY

# Strategic Investment in Rare Earth Permanent Magnet Manufacturing

*Powering the Future of Electric Mobility, Renewable Energy & Advanced Manufacturing*

**CLIENT: M/s. Mukund Ltd., Thane, Maharashtra**

INDUSTRY: Large-Scale Advanced Manufacturing | LOCATION: Thane, Maharashtra, India

[www.niir.org](http://www.niir.org) | [info@niir.org](mailto:info@niir.org) | +91 9097075054 | Confidential Document — For Client Use Only

## ABOUT NIIR PROJECT CONSULTANCY SERVICES (NPCS)

Niir Project Consultancy Services (NPCS) is one of India's most trusted names in industrial project consultancy, techno-economic feasibility studies, and Detailed Project Report (DPR) preparation. With over three decades of continuous service, NPCS has empowered thousands of entrepreneurs, MSMEs, and large-scale industrial investors to identify, plan, and execute profitable manufacturing ventures across diverse sectors.

NPCS is part of Asia's leading industrial knowledge ecosystem with thousands of project profiles and global consulting expertise. Our multidisciplinary team of engineers, economists, market researchers, and industry specialists delivers actionable intelligence that converts investment ideas into commercially viable industrial enterprises.

### Core Services

<input type="checkbox"/> <b>DPR Preparation</b>	Comprehensive Detailed Project Report covering all technical and financial aspects.
<input type="checkbox"/> <b>Market Analysis</b>	In-depth demand research, import substitution study, and competitive landscape mapping.
<input type="checkbox"/> <b>Technical Feasibility</b>	Manufacturing process evaluation, plant layout, and machinery selection guidance.
<input type="checkbox"/> <b>Financial Modeling</b>	Investment projection, IRR, payback period analysis, and EBITDA estimation.
<input type="checkbox"/> <b>Raw Material Analysis</b>	Domestic and import channel assessment for rare earth inputs.
<input type="checkbox"/> <b>Implementation Roadmap</b>	Phase-wise execution plan with milestones and operational readiness criteria.

## NPCS AT A GLANCE — AUTHORITY & TRACK RECORD

<b>30,000+</b> DPR Reports Published	<b>50+</b> Countries Served	<b>30+</b> Years of Expertise	<b>250,000+</b> Industrial Projects
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Across its 30+ years of operations, NPCS has served clients from more than 50 countries, spanning sectors as diverse as food processing, chemicals, pharmaceuticals, renewable energy, advanced materials, and heavy engineering. Our bankable DPRs are accepted by leading financial institutions, government agencies, and development banks for project financing and subsidy approvals.

## PROJECT SNAPSHOT

<b>Client Name</b>	M/s. Mukund Ltd.
<b>Project Location</b>	Thane, Maharashtra
<b>Industry Segment</b>	Large-Scale Advanced Manufacturing
<b>Project Recommended</b>	Rare Earth Permanent Magnet Manufacturing
<b>Consultancy Provided</b>	Techno-Economic Feasibility Study & Detailed Project Report (DPR)
<b>Implementation Status</b>	Approved for Further Execution

## CLIENT OVERVIEW — M/S. MUKUND LTD.

M/s. Mukund Ltd., a forward-thinking industrial enterprise based in Thane, Maharashtra, approached NPCS with a clear vision: to invest in a new-age industrial manufacturing venture that could deliver long-term profitability, scalable operations, and strategic positioning in future-ready markets.

### Client Investment Objectives

- Identify and enter a high-growth advanced manufacturing segment with domestic and export potential.
- Ensure long-term profitability with sustainable operational margins under current market conditions.
- Invest in scalable infrastructure with clear implementation pathways and phased growth strategy.
- Align with India's industrial transformation agenda including Make in India and PLI schemes.
- Maintain feasibility in terms of capital investment, raw material availability, and skilled manpower.

The client's strong entrepreneurial foundation and existing industrial relationships in the Thane region made them uniquely positioned to enter the advanced materials manufacturing space with institutional backing and OEM demand support.

## PROBLEM STATEMENT & MARKET CHALLENGES

Prior to NPCS's intervention, M/s. Mukund Ltd. faced several critical challenges in identifying and validating a suitable manufacturing investment opportunity:

### Key Challenges Identified

- **Market Gap:** A significant portion of India's demand for Rare Earth Permanent Magnets was being met through imports—predominantly from China—creating both supply chain vulnerability and an import substitution opportunity.
- **Technical Complexity:** Rare earth magnet manufacturing involves complex metallurgical processes, precision sintering, and specialized quality control requirements that necessitate expert technical guidance.
- **Capital Risk:** Without a validated feasibility study, deploying significant capital into a specialized manufacturing unit carried substantial financial risk.
- **Supply Chain Dependencies:** Raw material sourcing for rare earth inputs (Neodymium, Praseodymium, Dysprosium) required careful evaluation of domestic mining linkages and import strategies.
- **Regulatory Complexity:** Navigating PLI scheme eligibility, environmental clearances, and industrial licensing requirements demanded expert advisory support.
- **Market Validation:** Identifying reliable institutional buyers, OEM offtake agreements, and export opportunities required comprehensive primary and secondary market research.

## NPCS APPROACH & CONSULTING METHODOLOGY

NPCS employed a structured, five-stage consulting methodology tailored to the client's investment profile and market context. The approach integrated multi-dimensional feasibility analysis with actionable strategic guidance to minimize risk and maximize investment confidence.

Phase	Milestone	Duration	Details
Phase 1	<b>Project Identification &amp; Scoping</b>	Week 1–2	Assessment of client objectives, sector shortlisting, opportunity mapping in advanced manufacturing.
Phase 2	<b>Market Research &amp; Demand Analysis</b>	Week 3–4	Primary and secondary research on Rare Earth Magnet demand, import trends, competitive landscape.
Phase 3	<b>Technical Feasibility &amp; Process Design</b>	Week 5–7	Manufacturing process evaluation, machinery identification, plant layout, utility requirements.
Phase 4	<b>Financial Modeling &amp; DPR Compilation</b>	Week 8–10	Capital cost estimation, revenue projections, IRR/payback modeling, bankable DPR preparation.

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<b>Phase 5</b>	<b>Review, Advisory &amp; Handover</b>	Week 11–12	DPR presentation, strategic advisory inputs, implementation planning, stakeholder alignment.
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## TECHNICAL INSIGHTS — MANUFACTURING PROCESS

Rare Earth Permanent Magnets—particularly Neodymium-Iron-Boron (NdFeB) magnets—represent the highest-performance permanent magnet category available today. The manufacturing process for sintered NdFeB magnets involves a multi-stage precision production flow:

### Step-by-Step Manufacturing Process

- **Step 1 — Raw Material Procurement:** Procurement of rare earth alloys (Nd, Pr, Dy) along with Iron and Boron in specified purity grades. Materials are sourced through established domestic and import channels.
- **Step 2 — Alloy Melting & Strip Casting:** Raw materials are melted in vacuum induction furnaces at precise temperatures and cast into thin strips for uniform microstructure development.
- **Step 3 — Hydrogen Decrepitation:** The alloy strips are exposed to hydrogen gas to produce fine, brittle powder through controlled decrepitation—a critical step for subsequent milling.
- **Step 4 — Jet Milling:** Hydrogen-decrepitated material is jet-milled to ultra-fine particle sizes (3–5 microns) under inert gas atmosphere to prevent oxidation.
- **Step 5 — Magnetic Alignment & Compaction:** Fine powder is aligned in a magnetic field and compacted under high pressure in die molds to achieve anisotropic orientation.
- **Step 6 — Sintering & Heat Treatment:** Compacted green bodies are sintered in vacuum furnaces at high temperatures (1,050–1,100°C) followed by controlled aging heat treatment.
- **Step 7 — Surface Treatment & Coating:** Magnets are precision-cut, ground to dimensional tolerances, and coated (Nickel, Zinc, Epoxy) to prevent oxidation and enhance durability.
- **Step 8 — Magnetization & Quality Control:** Final products are magnetized using impulse magnetizers and subjected to rigorous quality testing including BH curve measurement, pull force testing, and dimensional inspection.

### Key Equipment & Technologies

- Vacuum Induction Melting Furnace (VIMF)
- Strip Casting Machine
- Hydrogen Decrepitation Reactor
- Jet Mill with Inert Gas System
- Magnetic Alignment Press & Isostatic Press
- Vacuum Sintering Furnace
- CNC Cutting & Grinding Machines
- Impulse Magnetizer & BH Curve Analyzer

## MARKET ANALYSIS & DEMAND OUTLOOK

The global Rare Earth Permanent Magnet market is experiencing one of its strongest growth cycles, driven by the global energy transition, electric mobility revolution, and rapid automation of industrial systems. India represents a particularly compelling demand market given its aggressive EV adoption targets, expanding wind energy installations, and defence modernization programs.

### Key Demand Drivers in India

- Electric Vehicle manufacturing under FAME II and PLI schemes — requiring high-performance traction motors.
- Wind energy capacity additions targeting 140 GW by 2030 — direct-drive turbines use NdFeB magnets.
- Defence modernization — advanced weapon systems, drones, and navigation equipment.
- Smart electronics and IoT device proliferation — compact magnets in sensors and actuators.
- Industrial automation and robotics growth — servo motors and precision actuators.

### Key Applications of Rare Earth Permanent Magnets

<p>↘ <b>Electric Vehicles</b> EV Motors &amp; Traction Systems</p> <p><input type="checkbox"/> <b>Industrial Robotics</b> Servo &amp; Actuator Drives</p>	<p><input type="checkbox"/> <b>Wind Energy</b> Turbine Generator Systems</p> <p><input type="checkbox"/> <b>Consumer Electronics</b> Smartphones, Speakers, Sensors</p>
<p><input type="checkbox"/> <b>Aerospace &amp; Defence</b> Navigation, Actuators, Drones</p>	<p><input type="checkbox"/> <b>Medical Equipment</b> MRI, Implants, Diagnostics</p>

Currently, India imports over 90% of its Rare Earth Permanent Magnet requirement—primarily from China—creating significant supply chain risk and a strategic import substitution opportunity. Domestic manufacturers entering this space now stand to capture both existing import demand and rapidly growing new demand from EV and energy sectors.

## FINANCIAL ANALYSIS & INVESTMENT OVERVIEW

Based on the detailed project assessment conducted by NPCS, the proposed Rare Earth Permanent Magnet Manufacturing Unit demonstrates strong financial viability under standard operating assumptions. The DPR includes a comprehensive financial model covering capital structure, revenue projections, and return analysis.

Financial Parameter	Estimated Value / Status
<b>Capital Investment (Plant &amp; Machinery)</b>	₹ XX Crores (as per DPR)
<b>Infrastructure &amp; Utility Development</b>	₹ XX Crores
<b>Working Capital Requirement</b>	₹ XX Crores
<b>Total Project Cost</b>	₹ XX Crores
<b>Internal Rate of Return (IRR)</b>	Viable & Attractive
<b>Payback Period</b>	Within Standard Industry Norms
<b>EBITDA Margin</b>	Sustainable under Standard Operating Conditions
<b>Break-Even Point</b>	Achievable within Initial Years

Note: Specific financial projections are contained within the confidential DPR delivered to M/s. Mukund Ltd. The indicative ranges above reflect NPCS's standard feasibility benchmarks for similar-scale manufacturing units in this sector. Final figures are subject to site-specific conditions, machinery selection, and market timing.

### Key Financial Highlights

- The project demonstrates a compelling IRR exceeding industry benchmarks, driven by strong institutional demand and premium product pricing.
- Payback period is projected within standard industry norms, supported by diversified revenue streams across multiple application sectors.
- EBITDA margins are sustainable under both conservative and optimistic demand scenarios modeled in the DPR.
- Capital expenditure is optimized through phased machinery procurement and modular plant design, reducing initial capital risk.
- The manufacturing unit qualifies for PLI scheme benefits, government subsidies, and priority sector lending, improving overall project economics.

## RESULTS & OUTCOMES DELIVERED

The NPCS engagement with M/s. Mukund Ltd. delivered measurable strategic, technical, and financial outcomes that enabled confident investment decision-making and clear execution planning:

<b>Strategic Entry</b>	Entry into the high-growth advanced materials market with long-term industrial demand.
<b>Import Substitution</b>	Reduced dependence on imports, positioning as a domestic supplier for OEMs.
<b>Financial Viability</b>	Viable IRR and payback period with sustainable EBITDA margins confirmed through DPR.
<b>Export Potential</b>	Opportunity to cater to global markets in EV, defence, and renewable energy sectors.
<b>Institutional Demand</b>	Secured long-term demand pipeline from OEMs, industrial buyers, and government entities.
<b>Risk Mitigation</b>	Structured feasibility study reduced investment uncertainty and accelerated decision-making.

Upon reviewing the techno-economic feasibility insights and implementation roadmap provided by NPCS, M/s. Mukund Ltd. expressed full confidence in the proposed project and formally agreed to proceed with the next phase of implementation planning. The DPR prepared by NPCS has served as the strategic foundation for financial structuring, stakeholder alignment, and operational readiness planning.

## CLIENT TESTIMONIAL

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*We approached Niir Project Consultancy Services (NPCS) with the intent to invest in a future-ready manufacturing venture. The Rare Earth Permanent Magnet project recommended by NPCS aligns well with our investment objectives and market outlook. The DPR provided comprehensive technical and financial insights that have enabled us to move forward with confidence. We appreciate the professional support extended by NPCS throughout the feasibility assessment process.*

**— M/s. Mukund Ltd., Thane, Maharashtra**

## WHY CHOOSE NIIR PROJECT CONSULTANCY SERVICES?

For over three decades, NPCS has been the preferred industrial consultancy partner for entrepreneurs, MSMEs, and large-scale investors seeking to build profitable manufacturing businesses. Here is why clients consistently choose NPCS:

✓	<b>Proven Industrial Expertise</b>	30+ years of hands-on experience across hundreds of manufacturing sectors.
✓	<b>Global Market Intelligence</b>	Deep understanding of domestic and international market dynamics, demand patterns, and trade flows.
✓	<b>Data-Driven Feasibility Studies</b>	Every recommendation is backed by rigorous technical analysis and validated financial models.
✓	<b>End-to-End Project Support</b>	From project identification and DPR to implementation advisory and investor support.
✓	<b>Risk Mitigation Framework</b>	Structured approach to identifying, assessing, and mitigating technical, market, and financial risks.
✓	<b>Bankable DPR Delivery</b>	Reports accepted by financial institutions, banks, and government agencies for loan and subsidy approvals.

## CONCLUSION

The successful identification, validation, and DPR preparation for the Rare Earth Permanent Magnet Manufacturing project for M/s. Mukund Ltd. exemplifies NPCS's core strength: converting complex industrial investment decisions into clear, bankable, and executable business plans.

In an era where advanced material manufacturing is becoming a national strategic priority—driven by electric mobility, renewable energy, and defence self-reliance—this project positions M/s. Mukund Ltd. at the forefront of India's industrial transformation. The comprehensive feasibility study and DPR delivered by NPCS have laid a strong foundation for long-term business success, investor confidence, and sustainable manufacturing growth.

Through its structured, data-driven consulting approach, NPCS continues to empower industrial investors across India and beyond—turning investment vision into measurable industrial reality.

## READY TO BUILD YOUR NEXT INDUSTRIAL PROJECT?

Partner with Niir Project Consultancy Services (NPCS) to transform your investment idea into a profitable industrial venture.

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□ [info@niir.org](mailto:info@niir.org) | □ +91 9097075054