

C L I E N T C A S E S T U D Y

Establishment of an Activated Carbon Production Unit

*Transforming Regional Resources into a High-Value Industrial Enterprise — Powered by
NPCS Expertise*

CLIENT

M/s. Indsil Hydro Power & Manganese
Ltd

LOCATION & SECTOR

Coimbatore, Kerala · Large-Scale
Manufacturing

SERVICES DELIVERED

Techno-Economic Feasibility · DPR ·
Market Assessment · Financial Viability ·
Strategic Advisory

STATUS

Client Confirmed Implementation
Planning

01 ABOUT NIIR PROJECT CONSULTANCY SERVICES (NPCS)

NPCS is part of Asia's leading industrial knowledge ecosystem with thousands of project profiles and global consulting expertise.

For over three decades, NPCS has been India's premier industrial consultancy — empowering entrepreneurs, MSMEs, large-scale investors, and government agencies to make informed, bankable manufacturing investment decisions. NPCS combines deep domain expertise, rigorous research methodology, and an unparalleled repository of industrial project data to guide clients from concept to commissioning.

DPR

Detailed Project Reports — Bankable, investor-grade DPRs covering technical, financial, and regulatory dimensions across 500+ industrial sectors.

TFS

Techno-Economic Feasibility Studies — Rigorous analysis integrating market dynamics, raw material availability, technology assessment, and financial projections.

MKT

Market Research & Demand Analysis — Multi-sector demand forecasting, competitive mapping, pricing benchmarks, and import-export opportunity identification.

ENG

Engineering & Implementation Advisory — End-to-end support: plant layout, machinery selection, utility planning, regulatory compliance, and go-live strategy.

02 NPCS AUTHORITY & TRACK RECORD

Our legacy is built on measurable outcomes, rigorous methodology, and an unwavering commitment to client success — across every industrial sector and geography.

30,000+

Project Reports Published

50+

Countries Served

30+

Years of Expertise

250,000+

Industrial Projects

03 CLIENT OVERVIEW

M/s. Indsil Hydro Power & Manganese Ltd, headquartered in Coimbatore, Kerala, is a diversified industrial group with an established presence in the energy and minerals sector. Seeking to expand into scalable manufacturing aligned with sustainability megatrends, the group engaged NPCS to identify and validate a high-potential new business venture.

Client	M/s. Indsil Hydro Power & Manganese Ltd
Headquarters	Coimbatore, Kerala, India
Sector	Energy, Minerals & Manufacturing
Project Recommended	Activated Carbon Production Unit
Services by NPCS	Techno-Economic Feasibility Study, DPR, Market Assessment, Financial Viability Analysis, Strategic Advisory
Engagement Outcome	Client confirmed implementation planning for Activated Carbon Production Unit

Investment Objectives

- Long-term profitability and business sustainability
- Strong and diversified industrial demand base
- Technical feasibility with scalable production potential
- Alignment with regional raw material availability
- Moderate-to-large capital investment feasibility
- Future growth and product diversification potential
- Entry into environmentally relevant industrial segments
- Access to domestic and export market opportunities

04 CHALLENGES & PROBLEM STATEMENT

Before engaging NPCS, the client faced six critical investment decision challenges requiring expert validation and structured analysis:

<p>01 Market Uncertainty Unclear demand growth visibility and competitive intensity for target manufacturing segments in domestic and export markets.</p>	<p>02 Technology Complexity Limited in-house knowledge of manufacturing processes, machinery specifications, and optimal production configurations.</p>
<p>03 Financial Risk Absence of bankable financial projections covering CapEx, operating costs, ROI, IRR, and payback benchmarks.</p>	<p>04 Raw Material & Supply Chain Need for expert assessment of Kerala's biomass and coconut shell availability, pricing, and logistics feasibility.</p>
<p>05 Regulatory Navigation Guidance required on environmental clearances, pollution control norms, and statutory approvals in Kerala.</p>	<p>06 Investment Sizing Determining optimal investment scale, production capacity, and phased scale-up strategy aligned to capital availability.</p>

05 OUR APPROACH & STRATEGY

NPCS applied its proven five-stage consulting methodology — ensuring every dimension of the investment opportunity was rigorously validated before the client committed capital.



Phase 1 — Project Identification

Structured screening of manufacturing opportunities against the client's objectives, regional resource strengths, and India's industrial policy priorities. Activated carbon was ranked highest on demand dynamics, raw material proximity, and investment compatibility.

Phase 3 — Technical Feasibility

Evaluated production technologies, equipment configurations, plant layout options, utility requirements, and capacity planning to determine the most operationally efficient manufacturing model.

Phase 5 — Implementation Strategy

Delivered a phased roadmap with actionable milestones, vendor recommendations, regulatory guidance, and go-to-market strategies for efficient project execution.

Phase 2 — Market Analysis

Multi-dimensional intelligence covering global and domestic demand trends, end-user industry growth, competitive landscape, pricing benchmarks, and India's import substitution potential.

Phase 4 — Financial Modeling

Comprehensive model encompassing CapEx, working capital, production cost structures, revenue projections, and return metrics (ROI, IRR, Payback Period) to validate investment attractiveness.

06 SCOPE OF SERVICES DELIVERED

NPCS delivered end-to-end consultancy coverage across all dimensions of the investment decision — from opportunity identification through to bankable project documentation:

<p>01 Detailed Project Report (DPR) Bankable DPR covering all technical, financial, and market dimensions for financial institution submission.</p>	<p>02 Market Research & Demand Validation Multi-sector demand analysis with 5-year growth projections across water treatment, pharma, food, mining, and export segments.</p>	<p>03 Raw Material Sourcing Analysis Regional supply chain assessment for coconut shells and agricultural biomass with pricing and logistics benchmarks.</p>
<p>04 Technical Feasibility & Plant Design Evaluation of production technologies, machinery selection, plant layout, utilities, and capacity planning.</p>	<p>05 Financial Modeling & Viability Full investment appraisal: CapEx, OpEx, revenue projections, ROI, IRR, and payback period analysis.</p>	<p>06 Strategic Implementation Roadmap Phased execution timeline, regulatory checklist, vendor recommendations, and market entry strategy.</p>

07 PROJECT EXECUTION & IMPLEMENTATION TIMELINE

The engagement was structured across five defined phases — each with clear deliverables, milestones, and quality gates to ensure rigorous and timely completion:

Phase	Activity	Key Milestone / Deliverable
Phase 1	Client Brief & Opportunity Screening	✓ Activated Carbon Production Unit identified as top-ranked opportunity
Phase 2	Market Intelligence & Demand Assessment	✓ Comprehensive sector report with 5-year demand forecasts delivered
Phase 3	Technical Analysis & DPR Preparation	✓ Full DPR with plant design and machinery specifications completed
Phase 4	Financial Modeling & Investment Appraisal	✓ Bankable financial projections with ROI, IRR, payback metrics finalised
Phase 5	Strategic Advisory & Implementation Planning	✓ Phased roadmap, regulatory checklist, vendor recommendations delivered
Outcome	Client Review & Investment Decision	✓ M/s. Indsil confirmed implementation planning for Activated Carbon Unit

08 TECHNICAL INSIGHTS — ACTIVATED CARBON MANUFACTURING

Activated carbon is a highly porous carbonaceous material produced through controlled carbonization and activation of organic precursors. Kerala's abundant coconut shell supply provides a premium feedstock with superior adsorption characteristics — ideally positioning the region for high-value manufacturing.

Manufacturing Process — Step by Step

#	Process Stage	Description
01	Raw Material Preparation	Coconut shells / agricultural biomass are cleaned, dried, and sized to uniform feedstock specifications for consistent processing.
02	Carbonization	Feedstock undergoes controlled pyrolysis at 400–700°C, removing volatiles and forming a carbon char with initial porosity.
03	Activation	Carbon char is activated via steam or chemical agents (KOH, ZnCl ₂ , H ₃ PO ₄) at 800–1,000°C — expanding surface area to 500–1,500 m ² /g.
04	Cooling & Washing	Product is cooled, washed with hot water or dilute acid, and neutralised to remove activation agent residues.
05	Drying & Sizing	Dried in rotary or spray dryers, then milled and screened to produce granular, powdered, or pelletised grades.
06	Quality Testing	Iodine value, BET surface area, ash content, moisture, and pH testing ensure product meets industry and export specifications.
07	Packaging & Dispatch	Finished product packed in HDPE bags or bulk containers and dispatched to domestic and export customers.

Key Machinery & Technology

- Rotary kiln / multi-hearth furnace — carbonization
- Steam activation reactor / chemical activation system
- Material handling conveyors and feedstock storage silos
- Cooling circuits and washing tanks with neutralisation
- Rotary drum or spray dryers for moisture control
- Ball mills / hammer mills for particle size reduction
- Vibratory screeners for product classification
- BET, iodine value, and pH quality-control instrumentation

09 FINANCIAL & MARKET ANALYSIS

Investment Snapshot

NPCS developed indicative investment parameters for a commercially viable production scale aligned with the client's capital profile and market entry strategy:

Financial Parameter	Estimated Indication
Total Capital Investment (CapEx)	Moderate-to-Large Scale — Site & Capacity Dependent
Plant & Machinery	Primary CapEx component (~45–50% of total investment)
Land & Civil Infrastructure	~20–25% of total investment (site-dependent)
Working Capital Requirement	3–4 months operational cycle funding
Estimated Internal Rate of Return (IRR)	Attractive double-digit range
Payback Period	Competitive for manufacturing sector benchmarks

Investment Component Breakdown

Component	Est. Share	Description
Plant & Machinery	~45–50%	Kilns, activation reactors, dryers, mills, screeners
Land & Civil Works	~20–25%	Site acquisition, buildings, utilities infrastructure
Working Capital	~15–20%	Raw materials, labour, packaging, operational overheads
Misc. & Pre-operative	~10–15%	Regulatory compliance, training, commissioning costs

Market Demand Growth — Sector Analysis

Activated carbon demand is driven by regulatory mandates, industrial expansion, and environmental compliance across multiple high-growth end-use sectors:

Market Segment	Demand Growth Intensity →	CAGR Est.
Water Treatment		8–10%
Industrial / Export		8–10%
Air Purification		7–9%
Mining (Gold Recovery)		7–8%
Pharma & Healthcare		6–8%
Food & Beverage		6–7%

Import Substitution Opportunity: India continues to import significant activated carbon volumes from China, Japan, and South-East Asia. A quality-compliant domestic facility offers meaningful import substitution value and cost advantages for domestic buyers, while simultaneously enabling export market access.

10 RESULTS & OUTCOMES

The NPCS engagement delivered tangible strategic and commercial outcomes — enabling confident, data-driven investment decision-making:

<p>✓ Investment Decision Confidence</p> <p>Client moved from exploratory interest to confirmed implementation planning, backed by a bankable DPR and validated market intelligence.</p>	<p>✓ Risk Reduction</p> <p>NPCS's feasibility process identified and quantified market, technical, and financial risks — enabling proactive mitigation planning.</p>
<p>✓ Market Clarity</p> <p>Clear, data-driven view of domestic and international demand dynamics, competitive positioning, and pricing benchmarks.</p>	<p>✓ Technical Readiness</p> <p>Detailed plant design, machinery specifications, and operational blueprint providing an actionable manufacturing setup guide.</p>
<p>✓ Financial Viability Validated</p> <p>Encouraging ROI, IRR, and payback projections confirmed the project's commercial attractiveness and investment-grade potential.</p>	<p>✓ Strategic Positioning</p> <p>Entry into the high-growth activated carbon segment aligns the client with India's environmental compliance megatrend.</p>

11 CLIENT TESTIMONIAL



NPCS provided us with valuable strategic insights and a structured feasibility assessment that enabled us to evaluate a sustainable industrial manufacturing opportunity with confidence. Their technical expertise, deep sector knowledge, and rigorous market understanding significantly supported our investment planning process. We were particularly impressed by the depth of analysis, the clarity of the financial projections, and the actionable implementation guidance delivered by the NPCS team.

— M/s. Indsil Hydro Power & Manganese Ltd, Coimbatore, Kerala

12 WHY CHOOSE NPCS

NPCS stands apart through a combination of unmatched industrial data depth, rigorous research methodology, and genuine client-centric advisory. Here is why leading manufacturers, investors, and institutions consistently choose NPCS:




<p>? Proven Industrial Expertise</p> <p>30+ years of deep domain knowledge across 500+ industrial sectors — chemicals, food, energy, metals, and advanced materials.</p>	<p>? Global Market Intelligence</p> <p>Proprietary databases covering demand trends, pricing, and competitive dynamics across 50+ countries for globally-informed decisions.</p>
<p>? Data-Driven Feasibility Analysis</p> <p>All recommendations grounded in rigorous primary and secondary research, financial modeling, and empirical validation — not assumptions.</p>	<p>? End-to-End Project Support</p> <p>NPCS accompanies clients from idea identification through DPR preparation, financial institution liaison, and market entry strategy.</p>
<p>? Risk Mitigation Framework</p> <p>Structured identification and quantification of market, technical, regulatory, and financial risks with proactive mitigation strategies.</p>	<p>? Bankable, Investor-Grade Reports</p> <p>NPCS DPRs and feasibility studies are structured to meet requirements of leading financial institutions, development banks, and investors.</p>

13 CONCLUSION

The engagement between NPCS and M/s. Indsil Hydro Power & Manganese Ltd exemplifies the transformative value that professionally prepared feasibility studies and expert strategic advisory deliver to industrial investors. Through rigorous, data-driven consulting, NPCS enabled the client to navigate complex investment decisions with clarity and full confidence.

The recommendation to establish an Activated Carbon Production Unit reflects NPCS's expertise in identifying manufacturing opportunities that are simultaneously technically feasible, commercially viable, environmentally aligned, and positioned for long-term growth. Kerala's abundant coconut shell resources, combined with surging global and domestic demand for activated carbon, create a compelling strategic window for this investment.




The client's decision to proceed with implementation planning stands as testament to the quality, depth, and bankability of NPCS's consulting deliverables — and to the organisation's ability to convert investment ideas into actionable industrial enterprises.

<p></p> <p>Strategic Value</p> <p>Expert opportunity identification aligned to client's long-term investment goals</p>	<p></p> <p>Long-Term Impact</p> <p>Entry into a high-growth, sustainability-driven industrial sector</p>	<p></p> <p>Investment Confidence</p> <p>Bankable DPR enabling financial institution and implementation engagement</p>
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READY TO BUILD YOUR NEXT INDUSTRIAL PROJECT?

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

<p></p> <p>DPR Preparation</p>	<p></p> <p>Feasibility Studies</p>	<p></p> <p>Market Research</p>	<p></p> <p>Strategic Advisory</p>
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