NIIR PROJECT CONSULTANCY SERVICES

Industrial Project Consultancy | Feasibility Studies | Market Research

CLIENT CASE STUDY

STRATEGIC FEASIBILITY ADVISORY

FOR

SUPER ABSORBENT POLYMER MANUFACTURING PROJECT

From Investment Idea to Industrial Reality — Powered by NPCS Expertise

CLIENT

M/s. Thermax Limited – Chemical Division

Pune, Maharashtra, India

ABOUT NIIR PROJECT CONSULTANCY SERVICES (NPCS)

Your Strategic Partner in Industrial Investment

Niir Project Consultancy Services (NPCS) is India's premier industrial project consultancy firm, serving entrepreneurs, MSMEs, startups, and large corporations across the globe. NPCS is part of Asia's leading industrial knowledge ecosystem with thousands of project profiles and global consulting expertise.

With over three decades of uninterrupted service, NPCS has become the trusted name for techno-economic feasibility studies, detailed project reports (DPRs), market research, and industrial advisory services that transform investment ideas into successful manufacturing enterprises.

30,000+	50+	30+	250,000+
Project Reports	**Countries Served**	**Years of Expertise**	**Industrial Projects**
Published & Updated	Global Reach	Proven Track Record	Delivered Worldwide

Core Services Offered by NPCS:

- Detailed Project Reports (DPR) – Comprehensive bankable reports for manufacturing ventures
- Techno-Economic Feasibility Studies – In-depth analysis of technical and financial viability
- Market Research & Demand Analysis – Actionable intelligence on industry trends and opportunities
- Engineering Advisory – Technical guidance on plant design, machinery selection, and process optimization
- Implementation Planning – Strategic roadmaps from concept to commercial production

PROJECT SNAPSHOT

At a Glance

Client Name	M/s. Thermax Limited – Chemical Division
Location	Pune, Maharashtra, India
Industry Sector	Industrial Chemicals & Specialty Polymers
Project Recommended	Super Absorbent Polymer (SAP) Manufacturing Unit
Services Provided	Techno-Economic Feasibility Study, Market Assessment, Raw Material Analysis, Project Cost Estimation, Financial Viability Evaluation, Implementation Planning
Implementation Status	Client Accepted NPCS Recommendation & Proceeded with Project Planning

CLIENT BACKGROUND & INVESTMENT OBJECTIVE

M/s. Thermax Limited, headquartered in Pune, Maharashtra, is a well-established Indian engineering and energy-environment solutions company serving global industrial markets. The company delivers integrated solutions across clean energy, clean air, water treatment, and industrial chemicals.

The Chemical Division of Thermax produces specialty chemicals and process solutions used across water treatment, construction, and industrial applications — making it an ideal candidate for expansion into high-value polymer manufacturing.

Strategic Investment Objectives:

- Identify a new manufacturing opportunity with long-term profitability
- Ensure sustainable operational scalability aligned with existing capabilities
- Leverage industrial chemical expertise for portfolio diversification
- Access raw material availability and supply chain ecosystems
- Capitalize on strong domestic and global market demand trends

The client engaged NPCS to conduct a comprehensive techno-economic feasibility analysis to identify and evaluate the most suitable manufacturing project aligned with Thermax's strategic expansion goals.

CHALLENGES & PROBLEM STATEMENT

Why Strategic Advisory Was Essential

Before engaging NPCS, Thermax's Chemical Division faced several critical challenges in identifying and validating a new manufacturing opportunity:

Market Intelligence Gaps	Limited visibility into which chemical segments offered the best domestic growth and import substitution potential.
Technical Complexity	Evaluating polymerization technologies and manufacturing processes required deep specialist expertise not available internally.
Financial Risk Assessment	Capital investment decisions required validated financial modeling, break-even analysis, and ROI projections.
Supply Chain Uncertainty	Assessing raw material availability, supplier ecosystems, and logistics for polymer manufacturing was complex.
Regulatory Navigation	Understanding environmental compliance, safety regulations, and licensing requirements for chemical manufacturing.

BUSINESS OPPORTUNITY IDENTIFIED

The NPCS Recommendation

Following rigorous feasibility analysis and market evaluation, NPCS identified and recommended the establishment of a Super Absorbent Polymer (SAP) Manufacturing Unit as the highest-potential investment opportunity for Thermax's Chemical Division.

What Are Super Absorbent Polymers?

Super Absorbent Polymers (SAP) are advanced cross-linked polyacrylate materials capable of absorbing and retaining liquid quantities several hundred times their own weight. They are a critical input material across high-growth industries:

Personal Hygiene Baby diapers, sanitary napkins, adult incontinence products	**Healthcare & Medical** Wound dressings, surgical absorbents, pharmaceutical applications	**Agriculture** Water retention polymers for soil moisture management
Industrial Absorbents Packaging, cable insulation, environmental spill management	**Construction Sector** Concrete curing, moisture barriers, waterproofing applications	**Specialty Chemicals** R&D, cosmetics, and advanced material applications

WHY THIS PROJECT WAS RECOMMENDED

Strategic Rationale from NPCS

NPCS evaluated multiple chemical manufacturing opportunities against Thermax's capabilities and market conditions. The SAP project was selected based on five strategic pillars:

1. **Strong Industry Growth —** The SAP industry is expanding rapidly, driven by rising demand for personal hygiene products across India's growing middle class and increasing health awareness.
2. **Import Substitution Opportunity —** India currently relies heavily on imported super absorbent polymers, creating a significant domestic manufacturing gap and first-mover advantage for new producers.
3. **Alignment with Chemical Expertise —** Thermax's strong capabilities in industrial chemicals and specialty polymer technologies provide a natural competitive advantage in SAP production.
4. **High Industrial Demand —** SAP materials serve multiple high-value industries simultaneously, reducing revenue concentration risk and providing diversified demand drivers.
5. **Long-Term Market Sustainability —** Growing population, rising hygiene awareness, and increasing urbanization will continue to expand SAP demand for decades, ensuring project longevity.

MARKET OPPORTUNITY & FINANCIAL ANALYSIS

Data-Driven Investment Insights

India SAP Market Overview:

Metric	Value	Significance
India SAP Market Volume (FY2022)	~50,000 Tonnes	Large existing market base
Projected Market Volume (FY2035)	~100,000 Tonnes	2x growth in 13 years
Market CAGR (2022–2035)	~5.4%	Consistent, sustained growth
Import Dependency	High	Significant substitution opportunity
Primary Driver	Hygiene Products	Diapers, sanitary napkins, adult care

Key Market Demand Drivers:

- Increasing adoption of baby diapers and premium hygiene products driven by urbanization
- Growth in female hygiene product consumption across Tier 2 and Tier 3 cities
- Rising awareness and adoption of adult incontinence care products
- Expanding healthcare and medical-grade absorbent product markets
- Agricultural use of water-retention polymers in water-scarce regions

Investment & Financial Highlights:

NPCS prepared detailed financial projections covering all major investment components:

Capital Investment Components	Financial Evaluation Metrics
✓ Land acquisition & industrial infrastructure	✓ Capital investment estimation (CapEx)
✓ Polymerization reactors & processing equipment	✓ Operating cost & profitability analysis
✓ Raw material procurement & chemical storage	✓ Break-even analysis & payback period
✓ Utility infrastructure (water, steam, energy)	✓ ROI projections & IRR calculation
✓ Environmental management & safety compliance	✓ Revenue potential from import substitution
✓ Skilled technical workforce & management	✓ Working capital & liquidity planning

SCOPE OF NPCS SERVICES DELIVERED

Comprehensive Consultancy Framework

NPCS deployed its full consultancy framework, delivering six integrated workstreams that collectively provided Thermax with all the intelligence required for a confident investment decision:

Project Opportunity Identification	Evaluation of manufacturing opportunities aligned with client capabilities
Market Research & Demand Analysis	Global and domestic SAP demand trends and competitive landscape study
Raw Material & Supply Chain Assessment	Evaluation of raw material availability and supplier ecosystems
Technical Feasibility Study	Manufacturing tech, process flow, plant capacity, equipment requirements
Financial Feasibility Evaluation	Capital estimation, operating costs, break-even, ROI projections
Implementation Planning	Plant location, project roadmap, risk analysis & mitigation strategies

TECHNICAL INSIGHTS

Manufacturing Process Overview

SAP is manufactured using a solution or suspension polymerization process. NPCS provided a detailed technical assessment covering:

Core Manufacturing Process Steps:

6. **Raw Material Preparation —** Acrylic acid monomer, cross-linking agents, and initiators are measured and prepared under controlled conditions.
7. **Neutralization —** Acrylic acid is partially neutralized with sodium hydroxide to form sodium acrylate, a critical step controlling final SAP properties.
8. **Polymerization —** Solution polymerization is conducted in reactors under carefully controlled temperature, initiator concentration, and pH conditions.
9. **Cross-Linking —** Cross-linking agents are introduced during or after polymerization to create the three-dimensional network that enables super absorption.
10. **Drying & Milling —** The hydrogel is dried in continuous belt dryers, then milled to the desired particle size distribution.
11. **Surface Cross-Linking —** Additional surface treatment enhances absorption under pressure (AUP), a critical quality parameter.

12. **Quality Control & Packaging —** Final product is tested for absorbency, particle size, and moisture content before packaging.

Key Machinery & Equipment Identified:

- High-capacity polymerization reactor vessels with temperature and pressure control systems
- Continuous belt dryers for hydrogel drying with energy recovery systems
- Industrial milling and classification equipment for particle size control
- Surface cross-linking reactors and heat treatment systems
- Automated quality control and testing laboratory equipment
- Material handling, storage tanks, and bulk packaging systems

RESULTS & OUTCOMES

Value Delivered to Thermax Limited

The NPCS advisory engagement delivered measurable strategic value across multiple dimensions of Thermax's investment decision-making process:

- **Import Replacement**
  Domestic SAP production reduces reliance on costly imports, strengthening India's industrial self-sufficiency and improving margins.
- **Diversification Opportunity**
  Expansion into high-value specialty polymer manufacturing broadens Thermax's industrial portfolio.
- **Technological Advancement**
  Establishing SAP production strengthens the company's capabilities in advanced chemical manufacturing.
- **High-Growth Industry**
  Rising demand for hygiene products ensures sustained market growth and revenue stability over the long term.
- **Export Potential**
  SAP products have strong global demand, opening pathways to international revenue streams.
- **Strategic Alignment**
  Directly leverages Thermax's existing expertise in specialty chemicals and industrial process solutions.

Following the comprehensive feasibility study, Thermax's Chemical Division formally accepted the NPCS recommendation and resolved to proceed with advanced project planning and investment evaluation for the SAP manufacturing unit — a direct endorsement of the quality and depth of NPCS's advisory work.

CLIENT TESTIMONIAL

> *"*
>
> *NPCS provided a well-structured feasibility study and market insights that helped us identify a promising manufacturing opportunity. Their detailed techno-economic analysis supported our investment decision and provided clarity on the project's long-term potential.*
>
> **— Management Team**
>
> M/s. Thermax Limited – Chemical Division, Pune, Maharashtra

WHY CHOOSE NPCS?

Your Competitive Edge in Industrial Investment

30+ Years of Industrial Expertise

Proven track record across diverse manufacturing sectors globally, delivering bankable feasibility studies and actionable intelligence.

Data-Driven Feasibility Analysis

Every recommendation is backed by comprehensive market data, financial modeling, and technical validation – not guesswork.

Global Market Intelligence

Deep understanding of domestic and international market dynamics, regulatory frameworks, and competitive landscapes.

End-to-End Project Support

From opportunity identification to implementation roadmap, NPCS provides integrated support across the entire project lifecycle.

Risk Mitigation Approach

Structured risk analysis identifies and addresses financial, technical, and market risks before you commit capital.

30,000+ Published Project Reports

Unmatched knowledge repository covering virtually every manufacturing sector, continuously updated with current data.

CONCLUSION

Strategic Value Delivered

The NPCS advisory engagement with M/s. Thermax Limited – Chemical Division exemplifies how deep industrial expertise, rigorous market analysis, and financial modeling can transform an investment ambition into a well-validated, implementation-ready opportunity.

By recommending the Super Absorbent Polymer Manufacturing Unit, NPCS delivered not just a feasibility report — but a strategic roadmap that aligned Thermax's technical capabilities with a high-growth market segment characterized by strong domestic demand, import substitution potential, and sustainable long-term growth.

This case study demonstrates NPCS's core value proposition: empowering industrial investors to make confident, data-driven decisions backed by 30+ years of expertise, 30,000+ project profiles, and a globally respected consultancy methodology.

Technical Feasibility	Market Opportunity	Financial Confidence
Confirmed manufacturing viability and process clarity	Validated strong demand, growth trajectory, and import gap	Provided bankable projections to support investment decision