

CLIENT CASE STUDY

Large-Scale Urea Manufacturing from Natural Gas

Transforming Libya's Natural Gas Reserves into High-Value Agricultural Opportunity

Strategic Industrial Investment Guided by NPCS

CLIENT

M/s. Masarat IT & Finance Services

Tripoli, Libya

INDUSTRY: Large Scale Chemical / Agricultural Manufacturing
CONSULTANCY BY: Niir Project Consultancy Services (NPCS)

01 ABOUT NIIR PROJECT CONSULTANCY SERVICES

Niir Project Consultancy Services (NPCS) is one of Asia's most respected industrial knowledge and consultancy organizations. Founded in 1983 and headquartered in New Delhi, India, NPCS has built a reputation for delivering rigorous, data-driven industrial consultancy services to entrepreneurs, investors, corporations, and government bodies across the globe.

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

Core Services

Consultancy & Advisory	Research & Analysis
<ul style="list-style-type: none"> ◆ Detailed Project Reports (DPR) ◆ Techno-Economic Feasibility Studies ◆ Project Identification & Selection ◆ Engineering Advisory Services 	<ul style="list-style-type: none"> ◆ Market Research & Demand Analysis ◆ Financial Modeling & Valuation ◆ Investment Planning & Structuring ◆ End-to-End Industrial Consultancy

02 NPCS BY THE NUMBERS

Four decades of consistent delivery have established NPCS as a globally trusted industrial consultancy partner.

<p>30,000+</p> <p>Detailed Project Reports Published</p>	<p>50+</p> <p>Countries Served Globally</p>	<p>30+</p> <p>Years of Industrial Expertise</p>	<p>250,000+</p> <p>Industrial Projects Delivered</p>
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03 PROJECT SNAPSHOT

Parameter	Details
Client Name	M/s. Masarat IT & Finance Services
Project Location	Tripoli, Libya
Industry	Large Scale Industrial Manufacturing
Project Identified	Manufacturing of Urea from Natural Gas
Services Delivered	Techno-Economic Feasibility Study, Market Research, Project Cost Estimation, Financial Viability Assessment, Strategic Advisory
Implementation Status	Client reviewed feasibility findings and is proceeding with project implementation planning

04 CLIENT OVERVIEW

M/s. Masarat IT & Finance Services is an investment and financial services firm based in Tripoli, Libya. With a strong interest in large-scale industrial ventures, the firm sought to leverage Libya's abundant natural resources to establish a commercially viable and nationally significant manufacturing operation.

Investment Objectives

- ▶ Long-term profitability from a capital-intensive industrial asset
- ▶ Sustainable manufacturing operations aligned with Libya's industrial development goals
- ▶ Strong utilization of Libya's regional natural resources, specifically natural gas
- ▶ Access to high-demand global markets, including African and Mediterranean regions
- ▶ Creation of domestic supply capacity and strategic export positioning

05 CHALLENGES & PROBLEM STATEMENT

Investing in a large-scale chemical manufacturing project of this nature demands navigating multiple critical risk dimensions. Without expert guidance, investors face significant exposure across technical, financial, and market dimensions.

Key Challenges Identified

Market & Financial Risks	Technical & Regulatory Risks
<ul style="list-style-type: none"> ◆ Accurately sizing global urea demand and pricing cycles ◆ Modeling capital intensity vs. return timelines for large-scale plants ◆ Evaluating import substitution vs. export opportunity scenarios ◆ Securing investor confidence with bankable financial projections 	<ul style="list-style-type: none"> ◆ Selecting appropriate production technology for gas-to-urea conversion ◆ Assessing feedstock (natural gas) supply reliability and costs ◆ Navigating environmental and regulatory compliance in Libya ◆ Designing scalable plant infrastructure and supply chain logistics

06 NPCS APPROACH & METHODOLOGY

NPCS deployed its proven, five-stage consultancy methodology to guide M/s. Masarat IT & Finance Services from initial project identification through to a fully investor-ready feasibility assessment.

01	02	03	04	05
<p>Project Identification</p> <p>Evaluated multiple sectors; urea manufacturing selected based on Libya's gas resources and global demand.</p>	<p>Market Analysis</p> <p>Detailed fertilizer demand mapping covering African, Mediterranean, and Middle Eastern markets.</p>	<p>Technical Feasibility</p> <p>Assessed production technology, plant design, process flows, and manufacturing benchmarks.</p>	<p>Financial Modeling</p> <p>Capital cost estimation, revenue projections, ROI, IRR, and break-even analysis.</p>	<p>Implementation Strategy</p> <p>Plant location, operational planning, and phased execution roadmap.</p>

07 SCOPE OF SERVICES DELIVERED

Feasibility & Research Services	Financial & Strategic Advisory
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- ◆ Detailed Project Report (DPR) preparation
- ◆ Techno-economic feasibility analysis
- ◆ Market research and demand validation
- ◆ Raw material (natural gas) sourcing assessment

- ◆ Capital investment and cost modeling
- ◆ Revenue projections and ROI analysis
- ◆ Plant capacity planning and layout guidance
- ◆ Implementation roadmap and strategic advisory

08 BUSINESS OPPORTUNITY IDENTIFIED

Following comprehensive feasibility analysis, NPCS recommended the establishment of a Urea Manufacturing Plant using Natural Gas as the primary feedstock. This recommendation was supported by a convergence of resource availability, market demand dynamics, and strategic regional positioning.

Why Urea Manufacturing?

- ▶ Urea is the world's most widely consumed nitrogen fertilizer, underpinning global food security
- ▶ Libya possesses significant proven natural gas reserves, providing a cost-competitive feedstock advantage
- ▶ Domestic production reduces Libya's fertilizer import dependency and strengthens food supply resilience
- ▶ Geographic location offers access to African, Mediterranean, and Middle Eastern export markets
- ▶ Urea manufacturing is a mature, technically established industry with stable global demand cycles

End-Use Applications of Urea

- ▶ Fertilizer production for agriculture — primary driver of global demand
- ▶ Resin and adhesive manufacturing (urea-formaldehyde resins)
- ▶ Automotive emissions control systems (AdBlue / Diesel Exhaust Fluid)
- ▶ Industrial chemical processes and synthesis

09 MARKET OPPORTUNITY & DEMAND OUTLOOK

The global fertilizer industry is on a sustained growth trajectory, driven by rising agricultural production needs, population growth, and intensification of food systems. Nitrogen fertilizers, of which urea represents the largest share of consumption, are essential agricultural inputs globally.

Key Demand Drivers

- ▶ Expanding global agricultural production to meet population-driven food demand
- ▶ Rising adoption of nitrogen fertilizers across developing regions in Africa and Asia
- ▶ Government programs supporting agricultural productivity and food security
- ▶ Increasing shift toward domestic fertilizer production in import-dependent nations
- ▶ Regional growth in Libya and neighboring MENA economies creating proximate demand

For Libya specifically, local urea production presents a transformative opportunity: replacing costly fertilizer imports with domestically produced supply while generating significant export revenue through regional trade.

10 FINANCIAL & INVESTMENT OVERVIEW

NPCS conducted a rigorous financial evaluation to provide M/s. Masarat IT & Finance Services with a clear picture of the investment profile, returns, and viability of a urea manufacturing facility at scale.

Financial Assessment Components

Capital Investment Estimation	Comprehensive costing of plant infrastructure, machinery, civil works, and pre-operative expenses
Operating Cost Analysis	Feedstock (natural gas), utilities, labor, maintenance, and overhead cost projections
Revenue Projections	Sales volume and pricing models based on domestic and export market analysis
Profitability Assessment	EBITDA margins, net profitability, and year-on-year financial performance modeling
ROI & IRR Analysis	Return on investment and internal rate of return over project lifecycle
Break-Even Analysis	Identification of break-even point and long-term financial sustainability

11 TECHNICAL INSIGHTS

Urea is produced via a well-established two-stage industrial process using natural gas as the primary feedstock. The Haber-Bosch process first synthesizes ammonia from hydrogen (derived from natural gas via steam methane reforming) and nitrogen (from the air). The ammonia is then reacted with carbon dioxide under high pressure to yield urea.

Manufacturing Process Overview

- ▶ Natural Gas Reforming — Steam methane reforming converts CH₄ and H₂O into synthesis gas (H₂ + CO)
- ▶ Ammonia Synthesis — Nitrogen from air and hydrogen combine over a catalyst (Haber-Bosch) to form NH₃
- ▶ CO₂ Capture — CO₂ is separated and captured from flue gas for use in urea synthesis
- ▶ Urea Synthesis — NH₃ + CO₂ react under high pressure to form ammonium carbamate, then urea
- ▶ Prilling/Granulation — Molten urea is prilled or granulated into the final fertilizer product form
- ▶ Quality Control & Packaging — Final product is tested and packaged for domestic distribution and export

Key Plant Requirements

Infrastructure & Equipment	Utilities & Support Systems
<ul style="list-style-type: none"> ◆ Gas reformer and ammonia synthesis loop ◆ CO₂ removal and purification units ◆ High-pressure urea reactor vessels ◆ Prilling tower or granulation unit ◆ Storage silos and packaging lines 	<ul style="list-style-type: none"> ◆ High-pressure steam and power generation ◆ Cooling water systems ◆ Instrumentation and process control (DCS) ◆ Environmental control and effluent treatment ◆ Laboratory and quality assurance facilities

12 PROJECT EXECUTION TIMELINE

NPCS designed a phased implementation roadmap to guide the client from feasibility to commissioning, with clear milestones and deliverables at each stage.

Phase	Milestone	Key Activities
Phase 1	Feasibility & DPR	Market research, technical assessment, financial modeling, DPR preparation — COMPLETED
Phase 2	Project Financing	Investor presentations, bank documentation, funding approvals, financial close

Phase	Milestone	Key Activities
Phase 3	Engineering & Procurement	Detailed engineering design, equipment procurement, contractor selection
Phase 4	Construction	Civil works, plant erection, utility installation, piping and instrumentation
Phase 5	Commissioning	Equipment testing, trial runs, quality certification, workforce training
Phase 6	Commercial Operations	Full-scale production, market entry, domestic distribution and export launch

13 RESULTS & OUTCOMES

Following the comprehensive consultancy engagement, NPCS delivered a fully investor-ready feasibility package that gave M/s. Masarat IT & Finance Services the confidence to commit to the project implementation planning phase.

Documented Business Benefits

- ▶ **Market Clarity:** Market intelligence on global urea demand, pricing, and supply dynamics
- ▶ **Investment Validation:** Validated the commercial logic of gas-to-urea manufacturing in Libya
- ▶ **Risk Reduction:** Reduced project risk through evidence-based technical and financial analysis
- ▶ **Funding Readiness:** Bankable DPR ready for financial institution presentation and funding approvals
- ▶ **Strategic Roadmap:** Established a structured implementation roadmap with clear phase-wise milestones
- ▶ **Competitive Edge:** Positioned the client to capitalize on Libya's gas reserves and export market opportunity

14 CLIENT TESTIMONIAL

"The techno-economic feasibility study provided by NPCS gave us valuable insights into the fertilizer manufacturing industry. Their structured analysis of market demand, raw material availability, and financial feasibility helped us make a confident investment decision."

— M/s. Masarat IT & Finance Services, Tripoli, Libya

15 WHY CHOOSE NPCS

Our Competitive Advantages	End-to-End Project Support
<ul style="list-style-type: none"> ◆ 40+ years of proven industrial consultancy expertise ◆ Global market intelligence across 50+ countries ◆ Data-driven, research-first feasibility methodology ◆ Bankable DPRs accepted by leading financial institutions 	<ul style="list-style-type: none"> ◆ Project identification through to implementation planning ◆ Multi-sector industrial knowledge base (1,000+ industries) ◆ Rigorous risk mitigation and financial stress-testing ◆ Dedicated advisory team with sector-specific expertise

16 CONCLUSION

This engagement demonstrates NPCS's ability to deliver strategic industrial consultancy that translates complex investment ideas into technically rigorous and financially credible project plans. The Masarat IT & Finance Services project exemplifies how Libya's vast natural gas resources can be converted into high-value industrial output — strengthening the domestic economy, reducing import dependency, and creating sustainable export revenue.

By combining four decades of industrial knowledge with a structured consultancy methodology, NPCS continues to empower entrepreneurs and investors worldwide to launch and scale successful manufacturing ventures with confidence.

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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