

CLIENT CASE STUDY

# Manufacturing of Ferrotitanium

## Kingdom of Bahrain

*"Turning Industrial Vision into a Bankable Reality"*

<b>Client</b> M/s. Crown Industries B.S.C (C)	<b>Location</b> Kingdom of Bahrain
<b>Industry</b> Ferro Alloys & Metallurgical Manufacturing	<b>Services</b> DPR   Feasibility Study   Market Research   Financial Modelling

## About NPCS — India's Premier Industrial Consultancy

Niir Project Consultancy Services (NPCS) is a globally recognised industrial advisory firm headquartered in New Delhi, India. For over four decades, NPCS has delivered data-driven project intelligence to entrepreneurs, corporates, financial institutions, and governments seeking to establish and expand manufacturing operations.

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

### Core Services

 **Detailed Project Reports (DPRs)** — Bankable, investor-ready reports

 **Techno-Economic Feasibility Studies** — Full viability assessment

 **Market Research & Demand Analysis** — Industry sizing and trends

 **Engineering & Process Advisory** — Plant design, machinery

 **Financial Modelling** — ROI, IRR, payback, P&L

 **International Project Support** — Projects in 50+ countries

## NPCS by the Numbers

**30,000+**

Detailed Project Reports  
Published

**50+**

Countries Served

**30+ Years**

Industrial Expertise

**2,50,000+**

Industrial Projects Delivered

NPCS maintains the most comprehensive industrial project database in South Asia, covering over 5,000 product categories across chemicals, food processing, pharmaceuticals, engineering, packaging, energy, and metallurgy.

## Project Snapshot

<b>Client Name</b>	M/s. Crown Industries B.S.C (C)
<b>Location</b>	Kingdom of Bahrain
<b>Industry Sector</b>	Ferro Alloys & Metallurgical Manufacturing

<b>Project Recommended</b>	Manufacturing of Ferrotitanium
<b>Consultancy Scope</b>	Techno-Economic Feasibility Study, Market Research, Project Cost & Financial Analysis
<b>Project Status</b>	Client reviewed NPCS feasibility insights and agreed to proceed with implementation

## Client Overview & Investment Objective

M/s. Crown Industries B.S.C (C) is an established industrial enterprise based in the Kingdom of Bahrain with a strong interest in diversifying its manufacturing portfolio. Recognising Bahrain's strategic position as a regional industrial hub and the GCC's growing demand for specialty metallurgical inputs, the company approached NPCS to identify and evaluate a high-potential manufacturing opportunity.

### Business Goals

- ▶ Identify a large-scale manufacturing project with strong long-term demand
- ▶ Achieve sustainable and scalable production operations
- ▶ Generate long-term profitability from a high-value specialty product
- ▶ Leverage Bahrain's proximity to Middle Eastern and global steel markets
- ▶ Develop export potential to international buyers across Europe and Asia

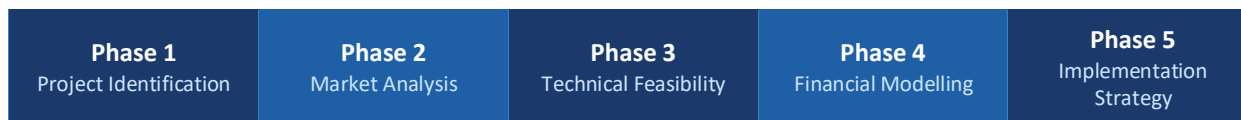
## Problem Statement & Challenges

Entering a specialty metallurgical manufacturing sector requires navigating a complex set of technical, financial, and market challenges. NPCS was engaged to address the following:

Challenge Area	Key Issue	NPCS Approach
Market Uncertainty	Lack of validated demand data for ferrotitanium in the MENA region	Primary & secondary market research
Technical Complexity	No established ferrotitanium production facility in Bahrain	Process engineering review & benchmarking
Financial Risk	High capital requirement with uncertain payback timelines	Detailed financial modelling & sensitivity analysis
Raw Material Sourcing	Titanium scrap availability and pricing volatility	Supply chain mapping & cost analysis
Regulatory Landscape	Industrial licensing and environmental compliance requirements	Regulatory framework overview

## Our Approach & Methodology

NPCS followed a structured five-phase methodology to deliver a comprehensive feasibility assessment for Crown Industries:



### Phase-by-Phase Overview

#### 1 Project Identification

Evaluated multiple manufacturing sectors and shortlisted ferrotitanium based on regional demand, investment scale, and strategic fit with Bahrain's industrial ecosystem.

#### 2 Market Analysis

Conducted in-depth research on global ferroalloy demand, pricing benchmarks, leading producers, and end-user industries including steel, aerospace, and automotive manufacturing.

#### 3 Technical Feasibility

Reviewed manufacturing processes for ferrotitanium, including induction furnace alloying, raw material specifications, plant layout requirements, and quality standards.

#### 4 Financial Modelling

Prepared a comprehensive financial model covering capital expenditure, operating costs, revenue projections, profitability at various capacity utilisations, and investor return metrics.

#### 5 Implementation Strategy

Developed a phased implementation roadmap covering land acquisition, plant setup, machinery procurement, workforce planning, and go-to-market strategy.

## Scope of Services Delivered

### Technical Deliverables

- ▶ Detailed Project Report (DPR) — full bankable report
- ▶ Plant layout and infrastructure planning
- ▶ Equipment and machinery selection
- ▶ Raw material sourcing strategy and supplier mapping

### Business & Financial Deliverables

- ▶ Market demand and competitive landscape analysis
- ▶ Financial projections — P&L, balance sheet, cash flow
- ▶ Capital expenditure estimation
- ▶ Working capital assessment

- ▶ Manufacturing process flowchart and step-by-step description
- ▶ Break-even and payback analysis
- ▶ Quality control and testing protocols
- ▶ IRR and NPV calculations
- ▶ Utilities and infrastructure requirements
- ▶ Phased implementation roadmap

## Project Execution Timeline

NPCS delivered the engagement through a well-coordinated, milestone-driven process. Key phases and deliverables are summarised below:

Phase	Activity	Key Milestone
Initiation	Client briefing, scope definition, data collection	Scope document signed off
Market Research	Demand analysis, pricing study, competition benchmarking	Market report submitted
Technical Study	Process review, plant design, machinery finalisation	Technical feasibility report
Financial Analysis	CAPEX/OPEX modelling, ROI projections, sensitivity testing	Financial model delivered
Final DPR	Integration of all sections, review, QA, client presentation	Complete DPR submitted
Follow-up Support	Client Q&A, implementation planning guidance	Client proceeds to next phase

## Technical Insights — Ferrotitanium Manufacturing

### Product Overview

Ferrotitanium is a ferroalloy composed primarily of iron and titanium, with titanium content typically ranging from 20% to 75%. It is used as an alloying additive in steel and other metals to improve mechanical properties, corrosion resistance, and grain structure refinement.

### Manufacturing Process

Step	Process Stage	Description
1	Raw Material Preparation	Procurement and sizing of titanium scrap, sponge, or ore concentrate along with iron scrap

2	Charge Preparation	Weighing and blending of titanium and iron materials in precise ratios for target alloy grade
3	Induction Furnace Melting	High-frequency induction furnace melts the charge at temperatures exceeding 1,700°C
4	Alloying & Refining	Fluxes and additives introduced to refine the melt, remove impurities, and control composition
5	Casting & Solidification	Molten ferrotitanium is cast into moulds or pigs and allowed to solidify under controlled conditions
6	Crushing & Sizing	Solidified ingots are crushed and sized into lumps as per customer specifications
7	Quality Testing & Dispatch	Chemical composition tested via spectrometry; products packed and dispatched to steel producers

### Key Machinery & Equipment

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>▶ Induction melting furnace (500kg–2MT capacity)</li> <li>▶ Raw material handling and weighing systems</li> <li>▶ Mould systems for casting and solidification</li> <li>▶ Jaw crusher and screening equipment</li> </ul> | <ul style="list-style-type: none"> <li>▶ Spectroscopic analyser for quality control</li> <li>▶ Cranes, overhead handling equipment</li> <li>▶ Dust extraction and filtration systems</li> <li>▶ Packing, palletising, and storage facilities</li> </ul> |
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## Financial & Market Analysis

### Market Demand & Growth Drivers

The global ferroalloys market continues to expand, driven by growth in steel-intensive sectors including infrastructure development, automotive production, aerospace engineering, and industrial machinery manufacturing.

Market Parameter	Insight
Global Ferrotitanium Market	Steady growth driven by specialty steel demand
Key End-Use Sectors	Stainless steel, aerospace alloys, automotive, construction

Regional Opportunity (GCC)	Rising infrastructure investment increases regional steel consumption
Import Substitution Potential	Bahrain and GCC currently import ferrotitanium; local production provides cost advantage
Export Markets	Europe, Asia (South Korea, Japan, India), and Southeast Asia

### Indicative Financial Parameters

NPCS prepared a detailed financial model for the proposed ferrotitanium manufacturing facility. The following indicative parameters were developed as part of the feasibility study:

Financial Metric	Indicative Range / Observation
Capital Investment	Significant CAPEX for furnace, plant, and infrastructure setup
Raw Material Cost	Titanium scrap / sponge accounts for the largest cost component (~60–70%)
Break-Even Capacity Utilisation	Typically achievable at 60–65% of installed capacity
Payback Period	Medium-term payback supported by strong industrial demand
IRR (Internal Rate of Return)	Attractive returns at projected market prices for ferrotitanium
Working Capital Requirement	Primarily driven by raw material inventory and receivables cycle

(Note: Detailed project-specific figures are proprietary and shared exclusively with the client as part of the commissioned DPR and feasibility study.)

## Results & Outcomes

The NPCS feasibility engagement delivered measurable value to Crown Industries across multiple dimensions:

#### Strategic Outcomes

- ▶ Validated market opportunity with quantified demand data
- ▶ Identified a technically proven and commercially viable product
- ▶ Defined a clear investment roadmap for project implementation

#### Business Benefits

- ▶ Reduced investment risk through rigorous feasibility validation
- ▶ Strengthened investor confidence with bankable financial projections
- ▶ Positioned Crown Industries as a first-mover in regional ferrotitanium production

▶ Established supply chain strategy for raw material procurement

▶ Clear go-to-market plan with defined target customer segments

Based on NPCS analysis and recommendations, M/s. Crown Industries B.S.C (C) confirmed its decision to proceed with project implementation planning — a testament to the quality and depth of insights delivered.

## Client Testimonial

*“The consultancy provided by NPCS offered valuable insights into the technical and financial feasibility of our proposed manufacturing project. Their structured approach and in-depth market analysis helped us confidently move forward with our investment plans.”*

— Management Team, M/s. Crown Industries B.S.C (C), Kingdom of Bahrain

## Why Choose NPCS

### ✓ Proven Industrial Expertise

Over 40 years of experience across 5,000+ product categories and 50+ countries ensure that NPCS recommendations are grounded in real-world industrial knowledge.

### ☑ Data-Driven Feasibility

Every NPCS report is backed by primary market research, verified industry data, and financial modelling — not generic estimates.

### 🌀 End-to-End Project Support

From opportunity identification through to plant setup and go-to-market planning, NPCS provides integrated support at every stage.

### 🌐 Global Market Understanding

NPCS tracks demand trends, pricing dynamics, and competitive movements across global markets — giving clients a strategic edge.

### 🛡️ Risk Mitigation Approach

Rigorous sensitivity analysis and scenario planning ensure that NPCS clients are prepared for market fluctuations and operational challenges.

### 📄 Bankable, Investor-Grade Reports

NPCS DPRs and feasibility studies meet the requirements of commercial banks, private equity investors, and government development agencies.

## Conclusion

This case study demonstrates how NPCS transforms complex industrial investment decisions into confident, data-backed actions. By delivering a rigorous techno-economic feasibility study for Crown Industries in

Bahrain, NPCS enabled the client to validate a high-potential manufacturing opportunity, understand market dynamics, and chart a clear path to implementation.

The ferrotitanium manufacturing project represents both a sound industrial investment and a strategic contribution to Bahrain's growing metallurgical sector — and this engagement exemplifies the depth of expertise and analytical rigour that NPCS brings to every client engagement.

Whether you are an entrepreneur evaluating your first manufacturing venture or an established corporation seeking to expand into new product categories, NPCS is your trusted partner for industrial intelligence and project success.

## READY TO BUILD YOUR NEXT INDUSTRIAL PROJECT?

*Partner with NPCS to transform your investment idea into a profitable industrial venture.*

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