

Feasibility Study for **SYNTHETIC ANODE MATERIALS PRODUCTION PLANT**

for lithium-ion batteries
10 000 tonnes per year
with expansion to 20 000 tonnes per year



Project Overview

Synthetic Anode Materials Production Plant for lithium-ion batteries



Project Objective

To develop, own and operate a synthetic anode materials production plant for lithium-ion batteries, providing a secure, reliable and cost-efficient supply of high-quality anode materials.

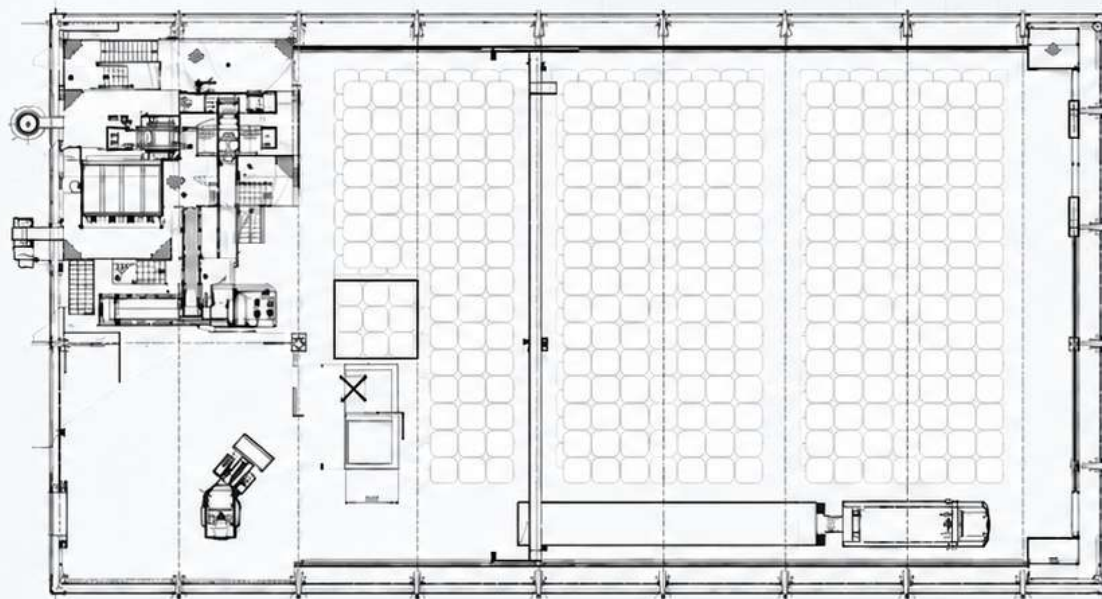
The plant will process needle coke supplied by the client. Crushing, grinding and shaping, followed by pitch mixing, granulation, carbonization, graphitization and secondary carbonization, will convert it into synthetic graphite anode material. Final screening, blending and magnetic separation will prepare the product for packaging.



Key Benefits

- ✓ Reliable supply of anode materials for lithium-ion batteries
- ✓ Reduced dependence on imported finished anode materials
- ✓ Improved supply chain reliability and cost efficiency
- ✓ Stable product quality and consistent specifications
- ✓ Reliable operation for continuous anode material production
- ✓ Reduced logistics and storage risks
- ✓ Advanced emissions control and environmental protection
- ✓ Scalable capacity for future expansion

Illustrative layout



Project Highlights

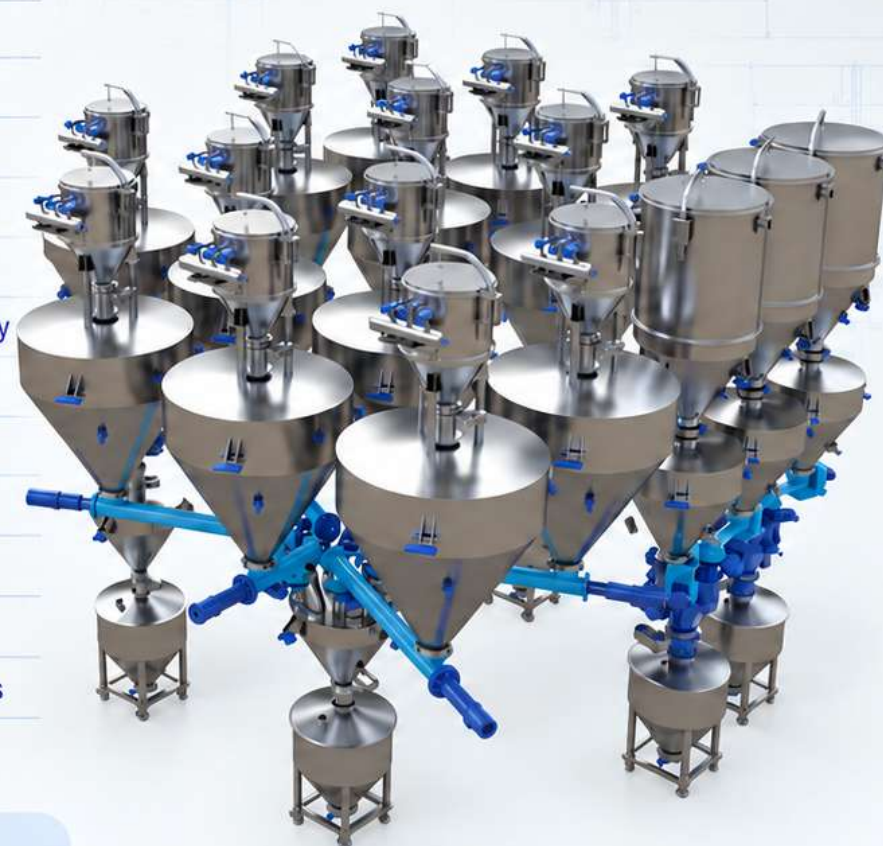
Location	NDA
End User	NDA
Feedstock	Needle coke
Product	Anode materials for lithium-ion batteries
Nominal Capacity	10 000 tonnes per year
Key Process Units	• Raw material receiving, storage, crushing and grinding • Shaping, pitch mixing and granulation • Carbonization, graphitization and secondary carbonization • Screening, blending and magnetic separation • Packaging, dispatch and off-gas treatment

Contents of the Feasibility Study

Synthetic Anode Materials Production Plant

for lithium-ion batteries

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The Feasibility Study contains **more than 360 pages** excluding appendices, supporting information and reference materials.

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Feasibility Study Scope and Level of Detail

Synthetic Anode Materials Production Plant for lithium-ion batteries

1	Executive Summary What is built, where, capacity, product, feedstock, selected technology, CAPEX/OPEX, schedule, risks and feasibility conclusion.	14	Civil, Structural and Buildings Buildings, foundations concept, roads, paving, drainage, bunds and preliminary structural basis.
2	Project Background and Objectives Project purpose, sponsor/company, assumptions, customer and study boundaries.	15	Fire Protection and Process Safety Fire water, detection, gas detection, extinguishing, ESD, hazardous area classification and key process hazards.
3	Design Basis Capacity, operating hours, climate, site conditions, design life and key design criteria.	16	Environmental Requirements Air, wastewater, noise, waste, stormwater, soil/groundwater and hazardous materials.
4	Applicable Codes, Standards and Regulations	17	Personnel Workforce exposure, pinch fumes, PAHs, dust, hot surfaces, noise, PPE, ventilation and escape routes.
5	Site and Infrastructure Plot, access, roads, elevations, preliminary geology/groundwater, neighboring facilities, battery limits and tie-ins.	18	Permitting and Approvals
6	Raw Materials and Product Specification Needle coke properties, anode material requirements, consumption, quality, storage and incoming control.	19	Construction and Execution Strategy EPC/package philosophy, sequence, temporary facilities and commissioning/start-up approach.
7	Process Technology Technology description, alternatives, selected concept, process flow, material balance, key temperatures and pressures.	20	Project Schedule Engineering, permits, procurement, construction, commissioning and operational start-up roadmap.
8	Plant Capacity and Operating Philosophy Annual/hourly rates, operating days/hours, turndown, availability, sparing and start-up/shutdown philosophy.	21	CAPEX Estimate Equipment, construction, utilities, infrastructure, engineering, contingency and estimate basis/accuracy.
9	Main Process Equipment Crushers, mills, shaping units, mixers, granulators, carbonization and graphitization furnaces, screens, magnetic separators and packaging.	22	OPEX Estimate Feedstock, gas, power, manpower, maintenance, waste disposal, consumables, water and other operating costs.
10	Utilities and Offsites Power, gas, water, air, nitrogen, thermal oil, fire water, drainage and utility consumption.	23	Economic / Financial Evaluation Revenue, EBITDA/cash flow, NPV, IRR, payback and sensitivities, if included in study scope.
11	Storage, Handling and Logistics Raw material receiving, storage and conveying, finished product storage, loading, truck traffic and storage autonomy.	24	Risk Assessment Technical, permitting, feedstock, product quality, schedule, utilities, CAPEX and environmental risks with mitigation.
12	Plot Plan and Plant Layout Preliminary arrangement, hazardous areas, access, fire roads, spacing and maintenance philosophy.	25	Conclusions and Recommendations Feasibility verdict, preferred option, open points and actions for the Basic Design phase.
13	Electrical, Instrumentation and Control Load estimate, transformers/MCCs, emergency power, PLC/DCS, UPS, instruments and Ex equipment.		



The feasibility study defines **25 core workstreams** covering technical, commercial, permitting, cost, schedule and risk aspects.

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Best regards!

PT Carbon Process Engineering

Our team develops feasibility studies and engineering solutions across a wide range of industrial sectors and project types.



Industries We Support

- Processing and manufacturing industries
- Chemical industry
- Agro and agro-processing sector
- Industrial products and consumer goods
- Cement industry
- Graphite and artificial graphite manufacturing



Project Types

- Greenfield projects
- Brownfield projects
- Capacity expansion and production upgrades
- Plant modernization and adaptation
- Relocation of production between sites or countries



Typical Advisory Scope

- Feasibility studies and project definition
- Technology selection and optimization
- Site selection and location screening
- Technology scouting and technology transfer
- Process improvement and implementation support



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