







OFFERING QUALITY
ENGINEERING
SERVICES



FACT Engineering & Design Organisation (FEDO), is a premier engineering consultancy organization in India, engaged in design, engineering and implementation of projects in process, petrochemicals, fertilizers and allied industries. FEDO is a part of a multi-divisional company, the Fertilisers And Chemicals Travancore Limited (FACT), a Schedule 'A' Government of India Enterprise under the administrative control of the Department of Fertilisers in the Ministry of Chemicals & Fertilisers. Established in 1965, FEDO has evolved into an engineering powerhouse with a capability that encompasses every facet of project engineering and management. In June 1995, FEDO became the first project engineering consultant in India to be awarded ISO 9001 certification by M/s DNV for quality standards (Presently upgraded to ISO 9001: 2008).



QUALITY POLICY

FEDO IS COMMITTED TO

- 1. CUSTOMER SATISTACTION THROUGH ENGINEERING EXCELLENCE
- 2. CONTINUAL IMPROVEMENT OF THE QUALITY SYSTEM
- 3. PROVIDE PRODUCT/SERVICE THAT MEETS CUSTOMER AND APPLICABLE STATUTORY AND REGULATIORY REQUIREMENTS

GENERAL MANAGER (F&F) OCTOBER 2009

Serving Our Clientele

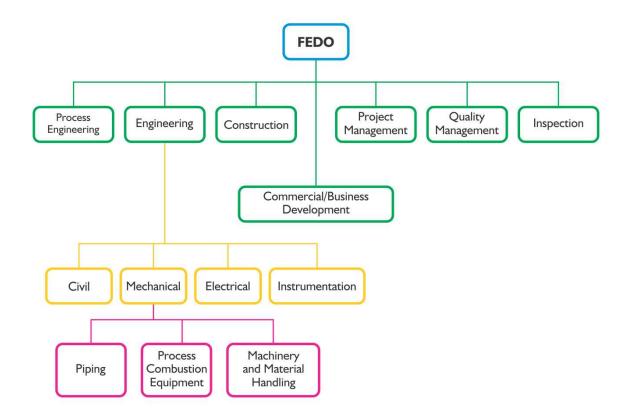
- Pre-project activities
 - Techno-Economic Feasibility Reports (TEFR)
 - Detailed Project Reports (DPR)
 - Pipeline route survey
- Basic Engineering Design Package (BEDP) for Sulphuric Acid plant, Alkali Scrubbing system, Offsite facilities, raw material and product storage & handling facilities.
- Residual process engineering and detailed engineering.
- Procurement assistance, construction supervision and commissioning assistance.
- Inspection services, including third party inspection and expediting services.
 Project management services including planning, cost control and associated MIS.
 - Maintenance and troubleshooting services, revamp and retrofit activities.
 - Electrical System/Power System Analysis using E-TAP Software.
 - HAZOP and HAZAN studies, disaster management studies, lightning protection adequacy studies etc. for existing plants.
 - Weak area assessment, performance improvement, Residual Life Assessment (RLA) Studies and Health Studies of plants. Safety and Fire Engineering services.

Competence

- Authorized agency for stage wise inspection of Unfired Pressure Vessels (Recognized by Department of Explosives of GOI)
- Official body for conducting statutory electrical energy audits of industrial undertakings (Recognized by Electrical Inspectorate of GOK)
- Experience in diverse fields such as Ammonia, Hydrogen, Chemicals, Petrochemicals, Fertilisers, Sulphuric/Phoshoric/ Nitric Acid, Oil & Natural Gas and Infrastructure (Roads & Industrial Parks)
- One of the few Indian Engineering Consultants capable of developing Basic Engineering package for Sulphuric Acid, Complex Fertilisers, ETP & Ammonium Sulphate plant
- A pool of highly experienced and qualified Engineers & Project Managers
- Draws on the rich Operation / Maintenance experience of Process Plants employing various generations of Technologies in the Manufacturing Divisions of FACT. This reflected in a more pragmatic approach to our Plant /Equipment Designs
- Rich experience of working with leading International Process Technology Licensors
- Haldor Topsoe, Denmark
- Toyo Engineering Corporation, Japan
- Stamicarbon, The Netherlands
- Prayon Technologies, Belgium
- . Chiyoda, Japan
- · UOP Incorporated, USA
- MW Kellogg, USA
- · Urea Casale, Switzerland
- · Linde, Germany
- BASF, Germany
- Lurgi, Germany
- Davy Power gas, UKHitachi, Japan
- Mistubishi, Japan
- Technimont, Italy
- Intec, Malaysia



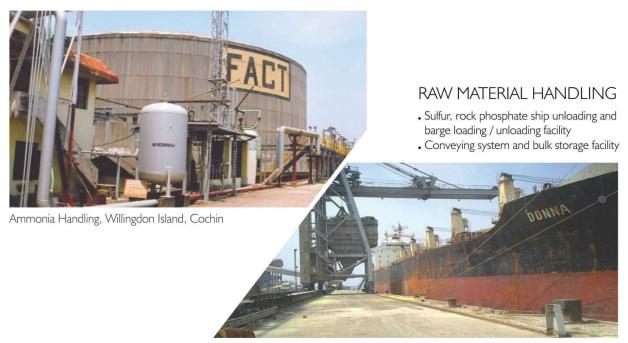
ORGANISATION STRUCTURE



MATERIAL HANDLING

STORGAE & HANDLING

- · Ammonia Storage Tanks
- Ammonia ship unloading, barge/truck/wagon loading/unloading facility
- Storage tanks for Sulfuric acid and Phosphoric acid



Hindalco - Ship unloading facility, Dahej

MATERIAL HANDLING

Petroleum Handling

- Mounted bullets (15 Nos.), Crude oil storage (11 Nos.), and product storages at IOCL, Paradip
- Oil Depots IBP Co Ltd., Rewari Haryana
- Bulk oil depots and handling facilities IBP Co Ltd., Nagapattinam (Cauvery Basin Marketing Terminal)
- Shore Tank Farm BPCL-KR, Cochin
- Oil depots and handling facilities IOCL Dhule, Tadali, Indore, Rajamundry, Navalur & Sankari
- · Oil storage terminal BPCL Irimpanam Cochin
- Fuel oil storage at Cordite Factory Aruvankadu Tamil Nadu

Fertiliser Raw Material Handling

- Phosphoric acid handling and storage facility, ship unloader at FACT Ltd., Willingdon Island Cochin
- Sulfur and Rocks Phosphate storage and handling facility at W.Island, FACT, Cochin
- Rock silo conveyor system Hindalco, Dahej

FACT – RCF BUILDING PRODUCTS LIMITED

FACT- RCF Building products Ltd (FRBL) is a joint venture of M/s Fertilisers and Chemicals Travancore Ltd, Cochin (FACT) & M/s Rashtriya Chemicals and Fertilisers Ltd, Mumbai (RCF) (both public sector undertakings under the Department of Fertilizers, Govt. of India

PRODUCT PROFILE

Glass Reinforced Fibre Gypsum Panel is a revolutionary cellular walling product with broad construction applications from load-bearing walls for individual domestic houses & multi-storey residential buildings. When used as load-bearing shear walls Gypsum Wall Panel exhibits ductile qualities that make it safer than masonry in earthquake prone structures. Glass Reinforced Fibre Gypsum panel is manufactured in an automated casting process using glass-fibre reinforced water-resistant gypsum plaster. All panels are 12 meters long and 3 meter high. The panels are cellular and 120 millimeters thick distributed with 48 cavities to the dimension of $93 \, \mathrm{mm} \times 230 \, \mathrm{mm}$

ADVANTAGES OF THE PRODUCT

- . Most suitable for affordable housing and repetitive houses
- Less time for project completion due to Mechanization & Automation
- Standardization with benefits of 20 -25 % savings
- Extra carpet area, better finish and low maintenance cost
- · Eco friendly



MAJOR INFRA PROJECTS



Project Management Services for Phase-II expansion of the campus for M/s National Institute of Technology, Nagaland in 291 acre of Iand comprising of Academic buildings, Administrative buildings, Lecture hall complex, Library buildings, Computer centre, Residential buildings, Guest house, Hostels for 800 students and other utility buildings with a project cost of over Rs. 236 crore

Project Management Services for setting up facilities for residential township for M/s. BPCL-Kochi Refineries in Kochi, Kerala. The facilities proposed in 8.23 acres of land comprises of 65 nos. residential flats in multi storey building (15 floor), one no. bungalow and 15 nos. of transit accommodation, club house with multi-purpose hall to accommodate approx. 1000 persons, utilities like power

installations, solar power plant, water storage tanks, waste disposal/sewage treatment plant, solid waste disposal facility, miscellaneous facilities like security cabin, watch tower substation, maintenance office, gate, covered/open paring, amenity building, street lighting, roads, drains, compound wall fencing, cable trench, water supply, fire water network etc.

CONSTRUCTION & CIVIL ENGINEERING

The Civil engineering and construction group of FEDO has evolved into an engineering power house catering to varied needs of industrial infrastructure and a wide spectrum of development and construction projects.

CORE SERVICES OFFERED

- DPR for Residential, Commercial, Industrial & Infrastructure projects
- Topographical, Contour & Cadastral survey
- Soil exploration & Sub soil investigations
- · Architectural services
- Structural Engineering services
- Transportation Engineering services
- Water Resources, Cost Estimation, Valuation & Tendering
- Quantity surveying, Cost Estimation, Valuation & Tendering
- Project Management services including Site Supervision & MIS

Urea Plant, FACT Cochin Division, Ambalamedu



Seaport Airport Road, RBDCK, Cochin



KINFRA, Koratty



FRBL, Ambalamedu, Cochin

CONSTRUCTION & CIVIL ENGINEERING

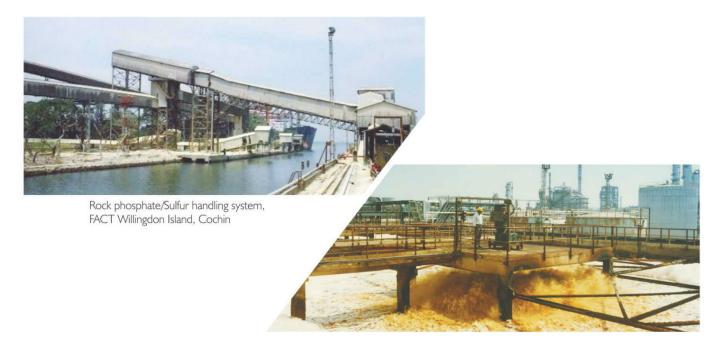
MAJOR INFRASTRUCTURE PROJECTS

- PMC services for the Seaport airport road Phase I at Cochin for RBDCK
- PMC services for Small Industries Parks at Koratty, Kunnamthanam, Adoor and Palakkad for KINFRA
- PMC services for Film and Video Park at Thiruvananthapuram for KINFRA
- Preparation of DPR for Seaport airport road Phase II, at Cochin for RBDCK
- Preparation of TEFR for approach road and bridge at Irumpanam for KSIDC
- Preparation of development scheme for Hi Tech Park at Kalamassery for KINFRA
- PMC services for waste treatment plants at Cochin for Corporation of Cochin
- · Valuation of development works of IT Park at Kakkanad for KINFRA
- · Consultancy services for widening of roads for CIAL
- Preparation of DPR for development works at KINFRA Export Promotion Industrial Parks, Cochin
- EIA Study and TEFR for Common Hazardous Waste Treatment Plant at Cochin for KSIDC
- PMC services for Textile Centre at Kannur for KINFRA
- PMC services for Stand alone water supply scheme for BPCL-KR, Cochin
- PMC services for Socio-Economic Development Schemes at Thaneerchal and Elamkunnapuzha for BPCL-KR, Cochin
- Valuation of Building & Structures in acquired land for RBDCK
- Surveying & Alignment Fixing of Coastal highway (Puthuvypin to Moothakunnam) for GIDA

FIELD OF OPERATION

FEDO has to its credit, engineering and project implementation expertise spread across diverse sectors of the industry over the past four decades and a half. They are namely:

- Fertilisers, Ammonium Chloride, Ammonium Sulphate, Mono and Di Ammonium Phosphate, Urea, Complex Fertilisers etc.
- Petrochemicals Caprolactam, Phenol, Methanol, Mono Chloro Benzene etc.
- Tank farms, Oil depots, LPG bottling plants, Design of Floating roof tanks, Crude Oil and Product tankages, Natural Gas distribution system etc.
- Process know-how for Sulfuric Acid, Phosphoric Acid and Alkali Scrubbing system.
- Infrastructure National Highways, Industrial parks, Textile parks, IT Park, Industrial Infrastructure Development Centers (IIDCs)., etc.
- Offsite Facilities Utilities, Raw Material / Product storage and handling systems, EHV power receiving and distribution stations, plant & non-plant buildings and industrial townships.
- Carrying out Health Studies, Residual Life Assessment and Weak Area Assessment for Process and Fertiliser plants.
- Stress Analysis of Piping System and Surge Analysis of Pipe line



Aeration pond, FACT Petrochemical Division, Cochin

FIELD OF OPERATION

Renfinery Related Projects

- PMC services for modification of CDU for BPCL-KR
- · PMC services for bitumen processing plant for BPCL-KR
- Basic Engineering Package for combined effluent treatment plant IOCL, Vadodara
- Basic Engineering Package for propylene splitter unit for BPCL-KR, Cochin
- . Engineering services for LPG bottling plants for HPCL
- · Rajamundry
- · Mahul
- Hyderabad
- Vijaywada
- PMC services for sulphur pastillation unit for Mangalore Refinery and Petrochemicals Ltd., Mangalore

Sulfuric Acid Projects

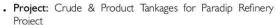
- Detailed engineering of sulfuric acid plant expansion project at Zambia for Konkola Copper Mines
- Basic and detailed engineering, procurement assistant services for alkali scrubbing facility for Oswal Chemicals (IFFCO Paradeep)
- PMC Services for pre dying system in sulfuric acid plant Hindustan Zinc Ltd., Udaipur
- PMCservices for off-gas based desulfurization project Hindustan Copper Ltd., Khetri Nagar, Rajastan
- PMC services for Recovery of Sulfur di-oxide from off-gas and Sulfuric Acid plant Hindustan Copper Ltd., Ghatsila
- PMC services for 1000 TPD sulfuric acid plant for FACT-Cochin Division, Cochin
- PMC services for revamp of 300 TPD sulfuric acid plant for Rashtriya Chemicals and Fertilizers Ltd., (RCF) Mumbai
- PMC services for 300 TPD sulfuric acid plant (DCDA) for Southern Petro chemical Industries Corporation Ltd.,
 Tuticorin
- LSTK services for 2 x 1000 TPD sulfuric acid plant for Paradip Phosphates Ltd., Paradip
- LSTK for 135 TPD sulfuric acid plant for Binani Zinc Ltd., Cochin
- EPC services for revamp of 600 TPD sulfuric acid and oleum production facility for FACT- Udyogamandal Complex, Cochin
- EPC services for 550 TPD sulfuric acid plant for FACT- Udyogamandal Complex, Cochin

Petro Chemical Plants

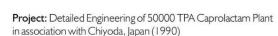
- EPC services for 10,000 TPA monchloro benzene project for HOCL, Rasayani
- EPC services for 40,000 TPA cumene phenol complex for HOCL, Cochin
- EPC services for 50,000 TPA caprolactam project in association with Chiyoda, Japan for FACT- Udyogamandal Complex, Cochin
- EPC services for 1,00,000 TPA methanol plant in association with Toyo Engineering Corporation Ltd., Japan for FACT- Udyogamandal Complex, Cochin







- · Client: M/s. Indian Oil Corporation Limited'
- Project Description: Project management, review of detailed engineering, construction management & supervision, procurement services and final certification of completion of facility for implementation of Crude & Product Tankages for Paradip Refinery Project
- Product storages 25 Nos DDFR, CIFR & SDFR tanks of various capacities ranging from [12,000m3 to 33,000m3 capacity each]
- Crude oil tanks 11 Nos[79mx 13.6m] DDFR
- LPG/propylene mounted bullets 15 Nos [6.4m x 93m]
- Intermediate tanks 2 Nos
- · Project: Single Point Mooring Project (SPM)
- · Client: M/s. BPCL-KR (Kochi Refinery) Corporation Limited
- Project Description: Single Point Mooring Project (SPM) intended for unloading of VLCCs off the coast of Kochi is a first of its kind project in Asia. FEDO was the PMC for setting up the onshore tank farm, pumping facilities, cross country crude pipeline, fire installation and associated facilities for this prestigious project. The tank farm was commissioned in December 2007. An extension of the tank farm in the form of addition of one more double deck floating roof crude oil tank was also entrusted to FEDO in 2009.
- Crude oil tanks 4 Nos [79m x 18m] DDFR
- Cross country crude oil pipeline [30 inch dia. & 10 km long]
- Cross country product pipeline [16 inch dia. & 2 km long]
- **Project 1**: EPC services for 2 x 1350 TPD of Ammonia Plants with process know-how from M.W Kellogg Co. USA
- Project 2: Health Assessment & RLA Study for 2 x I350 TPD Ammonia Plants
- . Client Krishak Bharati Co-operative Limited., at Hazira, Gujarat
- **Project:** Detailed Engineering of I 00000 TPA Methanol Plant in association with Toyo Engineering Corporation Ltd., Japan
- Client: Gujarat Narmada Valley Fertilizer Company Ltd., Bharuch Gujarat



- Project: Detailed Engineering of 990 TPD Ammonia Plant with process know-how from Haldor Topsoe USA (1998)
- · Client: FACT, Udyogamandal, Cochin









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Techno Economic Feasibility Reports (TEFR)

- TEFR on conversion of phosphogypsum to gypsum plaster and rapid wall for FRBPL (A FACT-RCF Joint Venture), Cochin
- TEFR on 150 TPD fertilizer granulation plant for FACT-Cochin Division, Cochin
- TEFR on ammonia urea complex for FACT-Cochin Division, Cochin
- . TEFR on 100000 TPA monazite processing plant for IREL, OSCOM, Odisha
- TEFR on 300/500 TPD methanol plant for OIL
- TEFR on 500 TPD methanol plant for Assam Petrochemicals

Detailed Project Reports (DPR)

- . DPR on 1000 TPD complex fertiliser (NP) for FACT-Cochin Division, Cochin
- DPR on 1500 TPD urea plant for FACT-Udyogamandal Complex, Cochin
- DPR on 2800 TPD ammonia and 3500 TPD urea complex for FACT-Cochin Division, Cochin
- DPR on 2000 TPD sulphuric acid plant for IFFCO, Paradip
- DPR on gypsum plaster and rapid wall for FRBPL, (A FACT-RCF Joint Venture), Cochin

Other Studies

- HAZOP study for PIBU offisites, LEFPU 1 &2 and PSU for BPCL-KR
- Risk analysis for carrying out hot works in TK -380 for BPCL-KR
- · Health Assessment Study of Urea and Ammonia Plant for GNFC, Gujarat
- . Detailed Health Study of Ammonia- Urea Plant for NFL, Nangal, Panipat and Bathinda
- Adequacy study for fir water network and allied facility for IOCL, Guwahati
- Market survey of RLNG Petronet terminal for KSIDC
- Risk assessment study for sulphuric acid and phosphoric acid storage tanks at Willingdon Island for FACT-Cochin Division
- . HAZOP study of Crude oil storage tank and pipeline for SPM facilities for BPCL-KR
- Review of safety integrity level (SIL) and risk assessment report of crude and finished product storage tank facility, IOCL Parapdeep
- HAZOP study of RLNG conversion of 990 TPD ammonia complex for FACT-UC, Cochin
- . HAZOP study of ammonia storage facility for FACT- Cochin Division, Cochin

Major Cross Country Pipeline Projects

- 30 "(750 NB) Crude Oil Pipeline from STF (Shore Tank Farm) Puthuvype to BPCL Kochi Refinery
- 2×600 NB Dock lines from NTB (North Tanker Berth) Ernakulam to IOC Terminal at Irumpanam
- 6" (150 NB) LPG pipeline from BPCL KR to HPCL, Irumpanam
- 40" (1000 NB) Raw water pipeline from Periyar river at Edamula to BPCL Kochi Refinery
- 24" (600 NB) Naphtha pipeline from BPCL KR to BPCL terminal at Irumpanam
- 16" (400 NB) Hot Oil pipeline from NTB (North Tank Farm) Ernakulam to BPCL Kochi Refinery
- 6" (150 NB) & 8" (200 NB) LPG/Propylene pipelines from Mangalore port to HPCL terminal
- 24" (600 NB) Product pipeline from Mangalore port to BPCL Terminal
- 10' (250 NB) Naphtha pipeline from BPCL Kochi Refinery to FACT, Udyogamandal

Major Projects executed by Instrumentation Engineering Department

- TEFR for the conversion of Instrumentation System to Distributed Control System for KMML, Chavara
- TEFR for the up gradation of Distributed Control System for Kochi Refinery, Ambalamugal
- Detailed Engineering for the conversion of Instrumentation System to Distributed Control System for HNL, Kottayam
- Detailed Engineering for the conversion of Instrumentation System to Distributed Control System for Ammonia Plant for FACT-CD, Ambalamedu

Major Projects executed by Electrical Engineering Department

- · Electrical System Analysis using ETAP software for BPCL-KR
- Lightning Protection studies for BPCL-KR, Apollo Tyres, KCPL, HOCL.
- · Relay Co-ordination study for GHCL, Binani Zinc
- · Feasibility studies for substation for BPCL-KR
- Energy Audits for IRE-Chavara, RBI Trivandrum, MILMA Kollam, Co-operative Spinning Mill – Chathannur (Kollam).
- Design and engineering for 66 kV substation for Cochin Shipyard
- Power system design and engineering for various projects for BPCL-KR, IOCL.
- Engineering review for 110 kV substation for Kerala Water Authority.

Fertiliser plant projects

- EPC services for revamp of ammonia plant with capacity enhancement from 750 TPD to 1050 TPD for Madras Fertilizers Ltd., (MFL), Manali, Chennai
- EPC services for 990 TPD ammonia plant for FACT-Udyogamandal Complex, Cochin
- EPC services for feed stock conversion of 990 TPD ammonia plant for FACT-Udygamandal Complex, Cochin
- EPC services for retrofit of 600 TPD ammonia plant for FACT- Cochin Division, Cochin
- LSTK for revamp of 1650 TPD Urea plant in association with Urea Casale, Switzerland and National Fertilisers Ltd., (NFL), Nangal, Punjab
- PMC services for setting up of 1000 TPD urea plant for FACT-Cochin Division, Cochin
- PMC services for expansion project of 750 TPD complex fertilizer plant for Rashtriya Chemicals and Fertilizers Ltd., (RCF), Mumbai
- LSTK for 670 TPD triple super phosphate plant for Hindustan Copper Ltd., khetrinagar, Rajasthan
- EPC services for 1600 TPD complex fertilizer plant for FACT-CD, Cochin

Certification and Inspection Jobs

- Drawing review, inspection and supervision of electrical works for IOCL, Mumbai
- Qualification of pressure vessels as per SMPV rules for FCRI, Palakkad
- Inspection of 500 MT steel storage tank at Yeroor Estate Factory for OIL Palm India Ltd., Kottavam
- Design check of foundation of PTS for LPSC, Mahendragiri
- Inspection of testing of I I kV XLPE cable for Cochin Shipyard, Cochin
- Inspection of ejector condensate drum, flare stack and columns for HOCL, Cochin
- Design approval and vetting of documents for floating roof tank for Gopal Engineering Works, Chennai and Aarkay Erectors, Cochin







Clientele of FEDO

Over the years, FEDO has actively participated in the Industrialization process by joining hands with firms in public private, joint and cooperative sectors to set up viable units in a most time bound manner. Some of our major clients are:

Oil and Gas

- Indian Oil Corporation Limited
- BPCL, Kochi Refinery (KR)
- Oil & Natural Gas Corporation Limited
- Gas Authority of India Limited
- Hindustan Petroleum Corporation Limited
- Bharat Petroleum Corporation Limited
- IBP Co. Limited
- Chennai Petroleum Corporation Limited
- Oil India Limited

Fertilisers

- National Fertilisers Limited (Panipat, Bathinda and Nangal)
- Krishak Bharti Co-operative Limited
- Indian Farmers Fertilisers Cooperative Limited
- Madras Fertilizers Limited
- Paradip Phosphates Limited Phosphates & Chemicals Limited
- Indo Gulf Fertilisers & Chemicals Corporation Limited (Hindalco, Dahej)
- Oswal Chemicals & Fertilizers Limited (IFFCO Paradeep)
- Gujarat State Fertilizer Corporation
- Gujarat Narmada Valley Fertilizer Corporation Limited

Others

- Mangalore Refinery & Petrochemicals Limited
- Hindustan Organic Chemicals Limited
- Hindustan Zinc Limited
- Hindustan Copper Limited
- Kerala Chemicals & Proteins Limited
- Travancore Titanium Products Limited
- Binani Zinc Limited
- Hindustan Insecticides Limited

Infrastructure

- GIDA (Goshree Islands Development Authority)
- KINFRA (Kerala Infrastructure Development Corporation)
- KSIDC (Kerala State Industrial Development Corporation)
- RBDCK (Roads & Bridges Development Corporation Kerala)



List of Projects

FEDO has executed a number of projects, either using its own process know-how or know-how obtained from other process licensors

- 4 Petrochemical plants (Phenol, Caprolactam & Methanol, MonoChloro Benzene)
- 13 Ammonia/ Hydorgen plants based on steam reforming of hydrocarbons
- 19 Sulphuric Acid plants
- 5 Phosphoric Acid plants
- 2 Formic Acid plants, 2 Nitric Acid plants and 3 Mini cement plants
- 10 Fertilisers salt plants (N, NP & NPK) (DAP, Urea, Ammonium Sulphate, Ammonium Chloride)
- 7 Pesticide plants (DDT, Endosulphan, Malathion, Gamma BHC, Dicofol, Bio-pesticides and Mancozeb)



FACT ENGINEERING AND DESIGN ORGANISATION

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