



LUDAN
GROUP

LUDAN GROUP

Business
Overview
2018



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General



General

Who We Are

LUDAN GROUP is proud to be a most diverse provider of integrated solutions for Industrial Development, Plant Optimization, Environmental Issues, and Industry- Specific Implementation Knowledge.

LUDAN GROUP is a unique blend of companies in the fields of Engineering, Software, Process Control, Environment, Energy and more, located in Israel, western Europe (Holland, Belgium), Eastern Europe (Romania, Bulgaria, Croatia, Russia) and China.

Our Vision and Philosophy - Built to Last

- Leading position in its environment
- Appreciated by professionals
- Leaving a deep impact
- Managed by consequent generations
- Several life cycles



Top Management



Top management



Arnon Aharon

Joint C.E.O



Yehuda Sarid

Joint C.E.O



Willem Pronk

CEO – LudanCom



Yuval Alon

C.E.O of Ludan
Engineering Israel



Dmitri Militescu

C.E.O of Ludan
Engineering SRL &
Regional Manager
Of Eastern Europe



Avi Lieber

C.E.O of Ludan Tech

Milestones



Milestones

Ludan Engineering Co. Ltd.

- 1977 - Foundation of Ludan Engineering Co. Ltd.
- 1979 - Ludan South Branch, Israel
- 1983 - Ludan North Branch, Israel
- 1995 - Foundation of Ludan Software & Control Ltd.
- 1997 - Ludan - IPO in Tel-Aviv Stock Exchange
- 1997 - Foundation of Ludan Engineering SRL, Romania
- 2005 - Foundation of Ludancom BV by Ludan Group
- 2005 - Acquisition of KH Engineering BV
 - 1949 - Foundation of KH Engineering as Keynes
 - Acquisition of KH Engineering by Matthew Hall Keynes
 - Acquisition of KH Engineering by AMEC Engineering
- 2007 - KH Engineering NV, Belgium
- 2008 - Foundation of Ludan Engineering Ltd., Bulgaria
- 2009 - Foundation of Ludan Engineering DOO, Serbia
- 2013 - Foundation of Ludan Engineering International Ltd.
- 2014 - Foundation of Ludan RUS Ltd., Russia
- 2015 - Foundation of Ludan China
- 2015 - Acquisition of Technip Benelux N.V. in Belgium
- 2015 - Acquisition of the Industrial Engineering department of Royal Haskoning DHV in Holland
- 2017 - Foundation of Ludan Trade

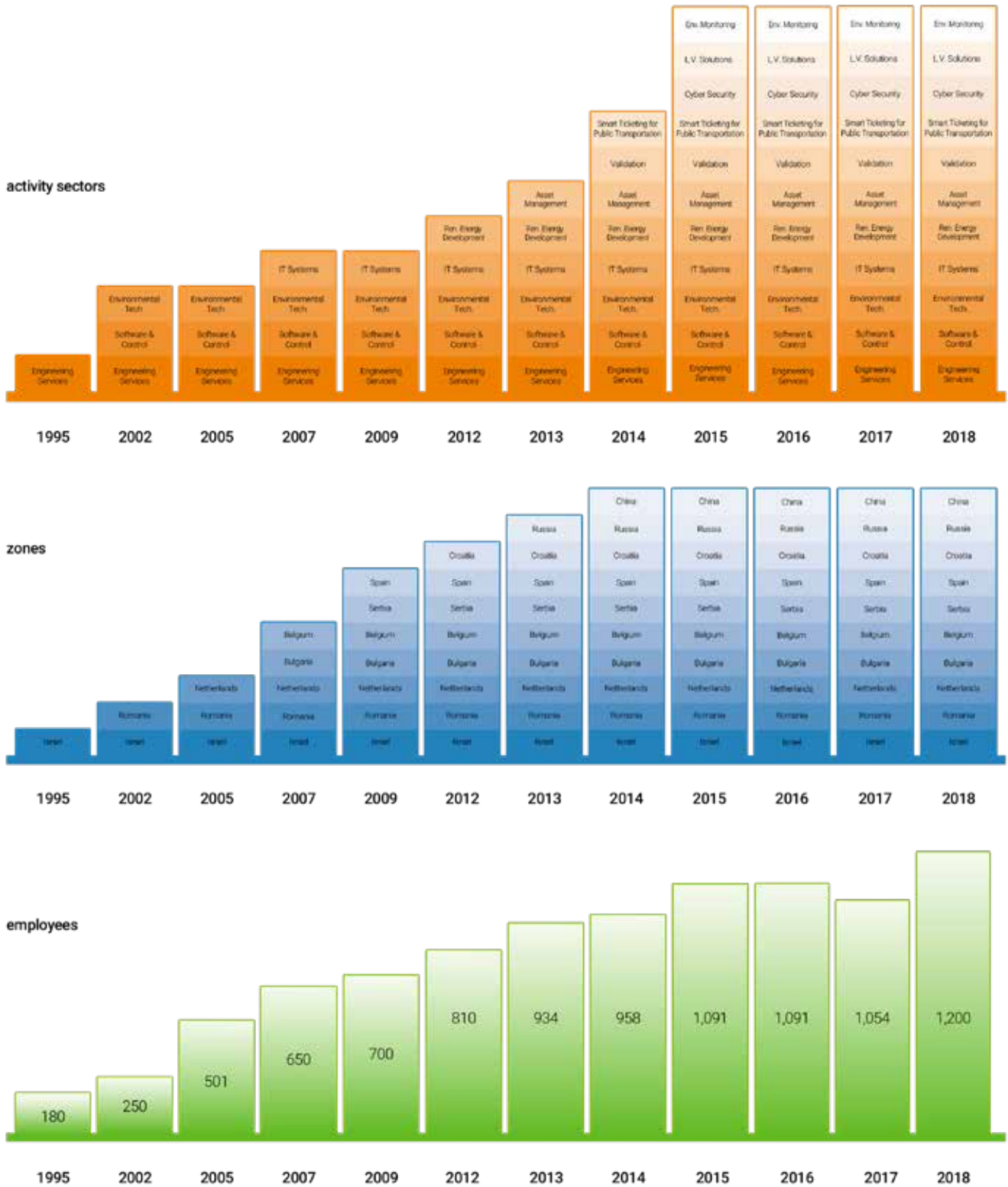
Ludan Tech Ltd.

- 2007 - Foundation of Ludan Tech Ltd.
- 2007 - Acquisition of Symcotech
- 2008 - Acquisition of Tact.
- 2008 - Foundation of Ludan Software & Control Systems SRL
- 2014 - Foundation of Ludan Cyber Security
- 2015 - Acquisition of Ardan Control- Tech.

Ludan Environmental Technologies Ltd.

- 2007 - Foundation of Ludan Environmental Tech Ltd.
- 2009 - Foundation of Ludan Renewable Energy in the Netherlands and Spain
- 2010 - 2014 Foundation of several SPC's to Build, Own and Operate biogas plants.
- 2015 - Acquisition of Eco Tech Environmental Services

Milestones



Group Structure



Ludan Group Structure

Ludan Engineering Co. Ltd. (Holding Company)

PROJECT IMPLEMENTATION	COMPUTERIZED SYSTEMS INTEGRATION	ENVIRONMENTAL AND ENERGY	TRADING
LUDAN INTERNATIONAL ENGINEERING SERVICES LTD. LUDAN ENGINEERING ISRAEL LTD. www.ludan.co.il LUDAN ENGINEERING LTD. BULGARIA www.ludan-group.com LUDAN ENGINEERING RUS KTD. RUSSIA www.ludan-group.com KH ENGINEERING NV BELGIUM www.khe.eu LUDAN CHINA www.ludan-group.com	LUDAN-TECH LTD. LUDAN SOFTWARE & CONTROL SYSTEMS ISRAEL www.ludansys.co.il SYMCOTECH ISRAEL www.symcotech.co.il LUDAN SOFTWARE & CONTROL SRL ROMANIA www.ludansys.co.il ARDAN CONTROL TECH ISRAEL www.ardantech.com CYBER SECURITY ISRAEL www.ludan-group.com	LUDAN ENVIRONMENTAL TECHNOLOGIES LTD. LBE HOLLAND, SPAIN www.ludan-env.com LUDAN ENERGY OVERSEAS ISRAEL, HOLLAND www.ludan-env.com LUDAN ENGINEERING & ENVIRONMENTAL DOO CROATIA www.ludan-group.com LEXTRAN LTD. ISRAEL www.lextran.co.il ECO TECH ISRAEL www.ludan-env.com	LUDAN TRADE TRADING W. EUROPE www.ludantrade.com TRADING ISRAEL www.ludantrade.com TRADING RUSSIA www.ludantrade.com TRADING GERMANY www.ludantrade.com TRADING E. EUROPE www.ludantrade.com

Where to find us



Where to find us



Israel



The Netherlands



Belgium



Romania



Croatia



Bulgaria



China



Russia

Spectrum of Services



Engineering

Main Markets

Refining and Petrochemical, Chemical and Agrochemical, Pharmaceuticals, Food, Semiconductors, Defense industries, and Power Plants.

Services

Services are provided as engineering services in the EPCM or EPC framework, which, inter alia, include:

- Project management
- Preparation and Control of budgets and schedules
- Permitting Authority Engineering
- Procurement and contracting
- Construction management and Supervision
- Validation (implementation of international standards, such as FDA/GMP)
- Commissioning



Computerized Systems Integration

Services

Software Implementation and maintenance of shelf software packages of international brands

Cyber Security Infrastructure threats protection solutions

Control Design and implementation of integrated Control Systems

Ticketing Implementation of ticketing systems for public transportation, including back office systems

Automated Test Equipment Supply of ATE systems for the defense industries

Multimedia - Video Conferencing and Smart Electricity Systems

HLS - Access Control and Video Surveillance

BMS - Building Management system

Street Light Control – street and outdoor light control system and energy saving



Environmental and Energy

Solutions

Providing consulting and remediation solutions for soil and groundwater; proven technologies and track record of treating all types of industrial waste, air pollution (including CO₂ from natural gas wells).

Services

Laboratory tests, field surveying, technology consultation, demo-installation, commercial and operating performance, maintenance.

Renewable energies

Energy production using raw materials from the green energy field, such as: recycled municipal waste, agricultural produce, organic waste, etc. (biogas, biomass, gasification and green gas).



Main Markets

Process Industry- Refining and Petrochemical, Chemical and Agrochemical, Pharmaceuticals, Food, Energy and Power Plants.

Services

Procurement Services are provided as agency, representing selected Chinese manufacturers, which, inter alia, include:

- ▶ Local presence in China.
- ▶ Technical involvement in proposal stage.
- ▶ Supporting Chinese manufacturers with International Q.A.
- ▶ Supporting communication during negotiation.
- ▶ Supporting expediting process.
- ▶ After sales support.



Market Presence & Major Clients



Market Presence

Markets/ Industries



Chemical



Energy



Natural gas



Petrochemical and Refining



Pharmaceutics



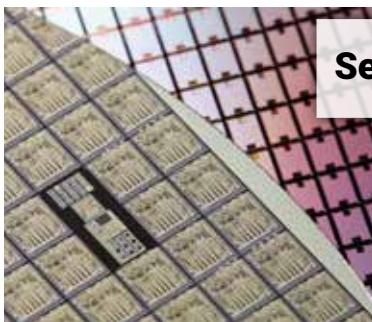
Public Transportation



Defense Industry



Food



Semiconductors



Agrochemical

Major Clients



Main 2018 Highlights



Main 2018 Highlights

Paz Oil Refinery - New Off Gas Recovery Unit (OGR)-LEI

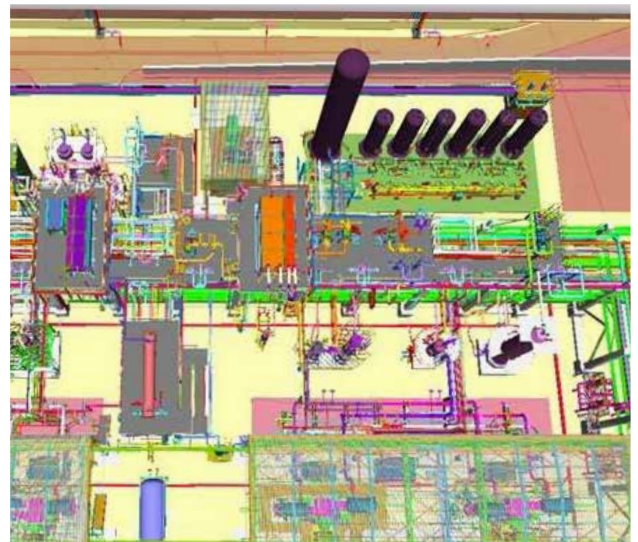
Project description:

The Off-Gas Recovery Unit (OGRU) in PAZ Ashdod Refinery (PAZAR) serves to separate the valuable C3 /C4 hydrocarbon fractions known as Liquefied Petroleum Gases (LPG) from light hydrocarbons mixtures obtained due to the Crude Oil processing throughout the Refinery. Currently these mixtures are being the basis for the plant fuel gas system.

The economic basis of OGRU is to produce more valuable LPG separated from the fuel gas mixtures and replace its heating equivalent by the available Natural Gas (NG), which has lower market price than LPG and is considered as an environmentally friendly fuel, "green fuel". The plant is operating successfully from end of 2018, meeting the expected performance.

Scope of Work:

- Permitting
- Project Management
- Detail design in all disciplines including:
 - Process
 - Piping and Model
 - Mechanical
 - I&C
 - Civil
- Erection and commissioning management



Main 2018 Highlights

MWSHB – MBR Detailed Design to Semiconductor Facility-LEI

Project description:

Upgrading of an existing plant and addition of new plants for handling effluents.

A process package and a preliminary layout were received from MWH and Ludan started to develop the system.

The project has two expansions.

Detailed design of last expansion was completed on January 2018. Support During Construction (SDC) completion is expected on June 2019.

Scope of Work:

- Overall Project Management and Coordination
- Civil Engineering.
- Plant layouts
- Piping design
- I&C design
- Construction superior supervision
- Support During Construction



Deleksun – Construction Management

Project description:

Construction Management of Plant at Dimona
(transfer of plant from Lod, Israel).

Installation of equipment from the old plant in Lod.

Project Scope: 80M NIS

Scope of Work:

- Construction Management



Main 2018 Highlights

Tel Kashish – Dovrat (doubling) high pressure NG pipeline

The project description:

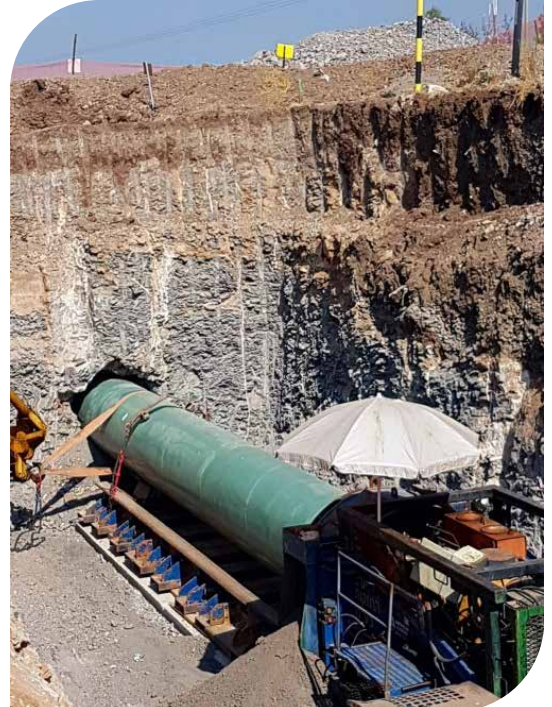
Doubling pipeline

The project includes laying of 31.5 Km of 36" high pressure natural gas pipeline

Construction and installation of 3 valve stations and 2 HDD

Scope of work:

- Project management
- Quality assurance
- Welding inspection and Supervision
- Pipeline works inspection and Supervision
- Document Control
- Mechanical work inspection and Supervision
- HSE services
- Budget and schedule control
- Landscaping and reinstatement supervision
- Cathodic protection inspection and Supervision
- Civil work inspection and Supervision



Main 2018 Highlights

Aurubis Hamburg

Heavy Industry

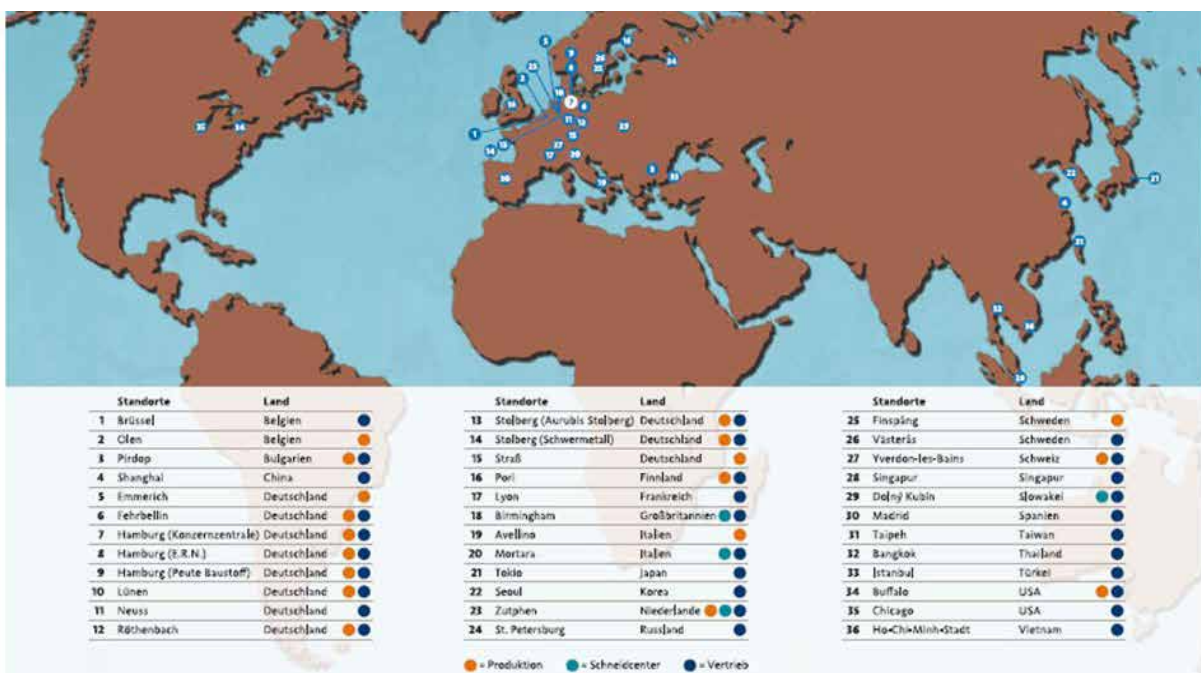


Project description:

Aurubis is one of the largest copper recycling company in the world. The FCM project is a new process to fabricate metals from scrap metal. Till today the company is winning out 1.1 million tons of scrap waste – such as computers, laptops, mobiles and printed circuit boards – about 45,000 tons of copper. There is also important by-catch: Forty tons of gold, ten tons of silver and some other half precious metals. These metals sell the company again as a raw material as semi. The KH Engineering team, which is occasionally reinforced with a few more employees from Schiedam and Amsterdam, will streamline the necessary administrative and management processes in this FCM project.

Scope of work:

KH Engineering has made a custom Work Breakdown structure-tool (WBS) and a custom Quality System (iMS) for Aurubis. With the WBS and iMS Aurubis can structure all administrative & management systems and manage the flow of documents processes as well. The team is currently working on the “Extended Basic including a Cost Estimate. In mid 2019 the start with the Detail Engineering.



Main 2018 Highlights

Lanxess

Chemical



Project description:

Lanxess has the goal to raise the actual rate of production and manufacturing capacity of their facilities in Leverkusen. It concerns a typical brown field project including demolition and addition of new equipment. A part of the existing equipment will be replaced and new equipment will be added to the facilities, in total 68 pieces of equipment must be handled in a confined period.

The works have been broken down in work packages which will be implemented in a logical process sequence.

The upgrade of the facilities will be executed during two major plant shutdowns. In the period between the two shutdowns construction works will be executed in a live operating plant.

In view of market and operational demand time is of the essence. A detailed method statement and tight schedule control are crucial for timely completion of each shutdown.

The project must be completed by January 2019.

Scope of work:

- Project management and control,
- Detail engineering,
- Expediting and inspection coördination works,
- Assistance with developing the subcontracting strategy,
- Construction management.



HES Hartel Tank Terminal

Storage & Logistics



Project description:

HES International is building a new white fuels blending terminal with a total capacity of approximately 1.3 million m³. The 54 tanks vary in volume from 10,000 to 50,000 m³. (Un)loading facilities include 5 sea going vessel berths of which one for VLCC's and 9 barge berths. Sub sea pipelines connecting HHTT with the BP Rotterdam Refinery is part of the project. The terminal is a high flexibility blending terminal for storage of all types of fuels: diesel, gas oil, petrol, petrol kerosene, as well as various biofuels, such as ethanol and additives. There is also the possibility to mix and homogenize refined products, additivation and butanization in the tanks and during transfers. Phased commissioning and start-up of the terminal is scheduled in the fourth quarter of 2019 and the first quarter of 2020.

Scope of work:

Cold eyes review; value engineering and re-design of concept supported by estimating of direct field cost for the whole project and several scope options; basic engineering; preparation of tender packages; specification of client's free issue items; support in stakeholder management; client's engineer checking detail engineering by contractors; construction management support: supervision, scheduling, document management, query/engineering support, QA/QC; commissioning support.



Main 2018 Highlights

200.000 TONS GRAIN TERMINAL



Project description:

S.C. CHIMPEX S.A. is developing a new grass-root grain terminal in Constanta with a total storage capacity of 200.000 tons with the purpose to increase its port-operation activities, this terminal being designed to facilitate truck, train and barge intake and load PANAMAX vessels. The Project consists of 20 silo cells, 10.000 tons each, with a processing capacity of 800 tons/hour. Project is expected to complete in May 2017.

Scope of work:

- Permitting;
- Multidisciplinary Design;
- Procurement management;
- Planning and Cost Controlling;
- Site Supervision;
- Project Management;



Technical Due Diligence



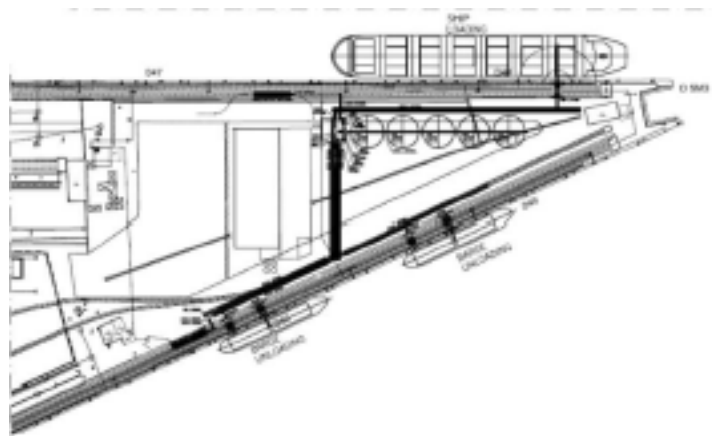
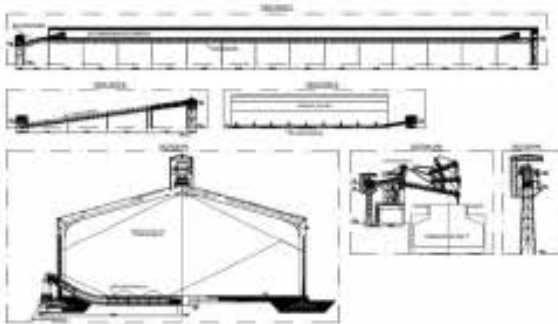
Project description:

Nidera is a global commodity service and solutions provider for agricultural market. A technical due diligence has been required in Romania with the main purpose of determining future investment opportunities.

Due diligence has considered the annual handling and storage capacity, analyzing various development options.

Scope of work:

- Evaluation of existing permits and technical documentation;
- Evaluation of site condition: platforms, roads, pavements, railways, utilities, buildings and structure;
- Evaluation of existing machinery and equipment;
- Conceptual Design and investment proposals;
- CAPEX & OPEX Estimation.



Main 2018 Highlights

Construction of Millhouse, Refinery, and Utility Systems for Capacity Increase Client: ADM- Amylum Bulgaria EAD, Razgrad

Project description:

Amylum Bulgaria, owned by U.S. agribusiness group Archer Daniels Midland Co, produces a complete range of starch products, including liquid sweeteners, native and modified starches, crystalline fructose and dextrose. The company is building a new corn processing facility, aiming to double its production capacity to process 900,000 tons of corn annually.

Ludan was awarded with an EPCM services contract which consist mostly brown-filled areas and has involved more than 130.000 design man hours spread between 50 process units. The project commissioning is scheduled for 2020 and is considered one of the largest investments of its kind in SE Europe in the last 10 years.

It is an engineering reference for Ludan, with a strong process component, which focuses on safety and minimizing downtime during execution phase in such a way that production can run simultaneously with the construction activities.



2018- Financial Data

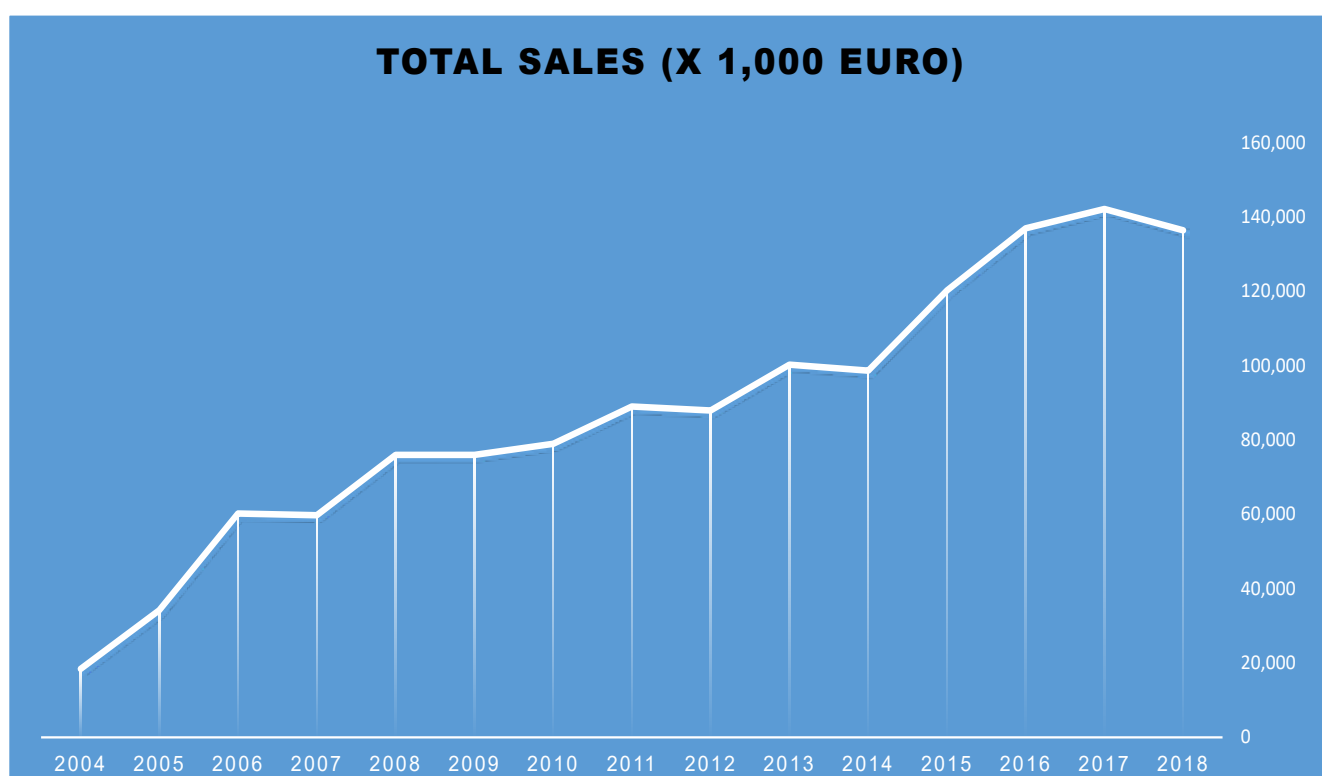


2018- Financial Data

Development of Financial Results 2016 - 2018

(Detailed data are available in the "Overview 2018"/ "Auditors Reports" in the Group website)

Consolidated Balance Sheet (in '1.000 EUR)	2016	2017	2018
Current assets	63,698	66,544	68,333
Investment in long-term receivables	12,155	11,454	3,312
Fixed assets	4,380	4,226	4,388
Intangible assets after amortization	6,805	6,461	6,013
Total assets	87,038	88,685	82,046
Current liabilities	47,516	52,025	54,343
Long-term liabilities	21,195	16,582	11,073
Minority interest	1,330	1,513	1,611
Shareholders' equity	16,997	18,565	15,019
Total liabilities and shareholder's equity	87,038	88,685	82,046
Consolidated Results (in '1.000 EUR)	2016	2017	2018
Sales	136,910	142,115	136,376
Gross Profit	20,225	20,457	17,969
Operating earnings	5,489	5,767	3,301
Earnings before income tax	3,431	3,784	67
Earnings (losses) after income taxes	2,125	2,373	(1,975)
EBITDA	8,418	7,839	6,351



Group Contacts



Group Contacts

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LUDAN
GROUP

global experience
local approach