COMPANY PROFILE

Prometheus S.r.l. is a consulting company housed in the office district of Corte Lambruschini, Piazza Borgo Pila 40, 16129 Genoa, ITALY.

The company offers consulting services, feasibility studies, process design, and software solutions for the Energy Industry, with excellent Oil Refining sector skills.

Prometheus Decision Support System software - for the Oil industry - features state-of-the-art technology and high prediction accuracy and usability standards. The system comprises different modules supporting the execution of the refinery supply chain optimisation's main tasks, from crude oil characterisation to finished products blending.

BRIEF HISTORY OF THE COMPANY

Prometheus was founded in 1985 by dr. **Alberto Ferrucci** to support the industrial application of new patents.

Ferrucci had already been **managing director of ISAB** refinery in Sicily and **Executive Vice President of ERG**, the organisation he helped to become the most prominent Italian private Oil group.

Some years later, with the support of its founder's experience, the company devoted mainly to the Oil Downstream sector, **helping refineries to improve profitability**.

Prometheus has carried out several studies in process and plant design, such as designing the Genoa Port Petrochemical Pole, restructuring refineries in Italy (IPLOM - Busalla and IES - Mantua) and Tunisia (STIR - Bizerte Refinery). The studies carried out included plants revamping for increased capacity, new products' marketing specifications, energy efficiency and utility rationalisation.

The company has also delivered feasibility studies to evaluate new investments' profitability and acted as the owner's engineer to monitor the feasibility and feed phases of a greenfield refinery project construction.

Prometheus licensed its software tools to various refinery operators and consultants in Italy and worldwide to build customised solutions supporting the execution of specific tasks.

SKILLS

Company skills include **feasibility studies** and **conceptual and process design** for new refineries, plant revamping, energy-saving solutions, improving quality of fuels and other oil products.

Prometheus process department disposes of a team of seasoned experts experienced in the essential topics required for effective refining profitability improvement.

Thanks to integrating its applications with the most advanced process simulation software available on the market, Prometheus technicians can suggest process optimisations according to feed and products quality requirements.

Prometheus developed a proprietary **Decision Support System** (DSS) suite of programs to support the decisions of every aspect of the Oil Refining System, allowing accurate short, medium and long term planning:

SIMRAF is the top application of Prometheus Decision Support System: it is a flexible, powerful and easy to use technical-economic simulator/optimiser for the Oil Industry (LP tool). SIMRAF can be used for new investment evaluation, medium and long-term planning, and quick and accurate simulation of very complex refinery schemes.

CUTS provides a sophisticated crude oil quality database to every Prometheus application and third-party applications.

PROLAV is the application dedicated to short term scheduling of refining operations end enables the simulation of the comprehensive refinery processing of crude oil batches.

OTTMIX is the application for the blending of available refinery streams optimisation, enabling quality give away minimisation.

PRORAF is the application for crude supply logistics simulation, enabling optimised storage and transfer facilities.

REFINERY OPTIMISATION EXPERIENCE

Before founding Prometheus, Dr Ferrucci had already developed a comprehensive experience in Linear Programming of refining systems.

In the '70s / '80s, he develops some of the first LP optimisation refinery models for the **ERG Genoa** and **ERG ISAB Refineries**.

In 1995, applying its DSS software, Prometheus builds a rigorous optimisation model for the **IES Mantua Refinery**. The model is then constantly improved in the coming years of operation to reflect the refinery's actual performance and follow the processing scheme's modifications.

In 2002 and 2004, Prometheus builds other LP models for the following **EGPC (Egyptian General Petroleum Company)** refineries:

- **SUEZ Oil Petroleum Company SOPC** - Crude Atmospheric (2) and Vacuum (2) Distillation, Coking, De-asphalting (2), Lube Oil Extraction, Dewaxing and Desulphurisation, Naphtha Desulphurisation, Platforming, UDEX Extraction and Benzene Fractionation, Solvent, Distillate Desulphurisation (2), Hydrogen and Sulphur, Asphalt, Wax Refining.

- **EL-NASR, SUEZ Petroleum Company, NPC** - Crude Atmospheric (4) and Vacuum (2) Distillation, Vapour Recovery, Naphtha fractionation, Kerosene Sweetening and Asphalt.

- **AMERYA, ALEXANDRIA Petroleum Refining Company**, **APRC** - Crude Atmospheric (2) Distillation, Lube Vacuum, De-asphalting, Phenol Extraction, Dewaxing and Lube Desulphurisation, Naphtha Hydrofining, Splitting and Semiregenerative Reforming, Aromatic Extraction, Kerosene Hydrobon and fractionation for Molex and Linear Alkyl Benzene Alkylation (LAB), Light Gasoline Isomerisation.

- **ALEXANDRIA Petroleum Company, APC** - Crude Atmospheric (3) and Vacuum (1) Distillation, Vapour Recovery, De-asphalting, Asphalt, Solvents Fractionation (2), Kerosene/Solvents Hydrofining, Wax Hydrofining, Lube Hydrofining. The scheme of this refinery is integrated with two other refineries also represented in the simulation: **Alexandria National Refining and Petrochemical (ANPRC)** equipped with Naphtha Hydrofiner, Splitter, CCR Reforming and Recycle Isomerisation, and **Alexandria Mineral Oils** (**AMOC**) equipped with Vacuum Distillation to produce light distillates treated in a MEK Dewaxing, and wax distillates treated in Lube Sulfolan and Furfural Units.

- **CAIRO Oil Refining Company, MOSTOROD -** Crude Atmospheric (4) Distillation, Naphtha and Kerosene Desulphurisation, Platforming, Isomerisation, Diesel Desulphurisation.

- **CAIRO Oil Refining Company, TANTA** - Crude Atmospheric Distillation, Condensate Distillation , Vapour Recovery.

- **ASSIUT Oil Refining Company** - Crude Atmospheric (2) Distillation, Vapour Recovery (2) and Naphtha Fractionation (2).

To fine-tune LP Models according to actual plants' performance, Prometheus makes - for each refinery - a general survey, collecting data and running tests in co-operation with the refinery technicians. Prometheus consultants also trains local managers and technicians to update the refinery model and the related Crude Oil Database.

In 2004, Prometheus prepares with all collected data the **EGPC Multi Refinery Model** which simulates the seven refineries in a unique global System.

Eighteen Egyptian Crude Oils, available pipelines, different market demand areas, and import-export opportunities were analysed together with the seven refineries' processing schemes to get a global optimisation result.

In 2007 Prometheus builds an LP and Scheduling model for AORC Refinery located in Zawiya, Libya, in 2009, an LP model for STIR Refinery located in Bizerte, Tunisia:

- **Azzawyia Oil Refining Company** (AORC): Two parallel processing trains with Crude Distillation Vapour Recovery, Naphtha Hydrogenation and Splitting, Semi regenerative Reforming. One Vacuum unit for Asphalt production.

- **Bizerte Refinery** (STIR): Crude Distillation Unit with Vapour Recovery, Naphtha Hydrogenation and Splitting, Semi regenerative Reforming.

In 2013 supports the UK consulting firm Palmer International Partnership in modelling PAZ (located in Ashdod, Israel) and HMEL (located in Bathinda, India) refineries. Our clients have used these models to carry out various consulting activities, including validating the existing LP models built with other technologies.

- **Ashdod refinery** (PAZ): Crude Distillation (Atmospheric and Vacuum), Naphtha Hydrogenation and Splitting, Continuous Reforming, Alkylation, MTBE, FCC, Visbreaking, Mid Distillates Hydrofining.

- **Bathinda refinery** (HMEL): Crude Distillation (Atmospheric and Vacuum), Naphtha Hydrogenation and Splitting, Continuous Reforming, Isomerisation, FCC (Propylene production-oriented), Mid Distillates Hydrofining, VGO Desulphurization, Delayed Coking, Poly Propylene Unit.

In 2017 starts a co-operation with **HMEL Bathinda Refinery** (Punjab, India) to develop a Scheduling Model based on CUTS and PRORAF technologies representing the Crude Logistics (cargoes reception, storage, mixing and shipment via pipeline) and supporting the long and short term scheduling activities. The model is finalised and delivered in summer 2019. In 2021 HMEL extends the co-operation to finished products blending activities using OTTMIX technology.

In 2018 co-operates with **IPLOM** and **ITALIANA PETROLI** groups delivering CUTS software providing Crude Oil Characterisation Data to the third party's various software applied for operations planning and scheduling.

In the period 2018-2021, the company provides Owner's Engineering services to **MONGOL REFINERY** in the **Sainshand refinery** construction project framework. The activity initially focuses on the Detailed Feasibility Study's due diligence (appointed by **MAIRE KT** as selected subcontractor) and then on the early engineering phases (open art units FEED, licensors selection, EPC bids issue), following to the direct appointment from Mongol Refinery.

Between 2019 and 2021, Prometheus realises jointly with two other companies, the **TUNEREP Project**, a 360-degree study focused on the Tunisian Energy sector to define the Country Energy strategies to the horizon 2040. In this framework, Prometheus studies the downstream Oil sector. It highlights the best possible refinery configuration to fit the country demand for oil products with the crude oils available in the Mediterranean area

Furthermore Prometheus developed many demonstrative LP Optimisation Models representing the following refineries:

COUNTRY	COMPANY	CDU Capacity [bbl/d]	Vacuum Distillation	Catalytic Conversion	Thermal Conversion	Hydrotreat	Other
ARGENTINA	EG3 Bahia Blanca	29000	Topped Crude	Semi regenerative Reforming FCC	Visbreaker	Naphtha Distillates	Isomerisation
BRASIL	PETROBRAS Capauava	47000		FCC			
	PETROBRAS Cubatao	163000	Topped Crude	Semi regenerative Reforming FCC	Delayed Coker	Naphtha	Isomerisation Alkylation Dehydro.iC4 MTBE Hydrogen
	PETROBRAS Paulinia	356000	Topped Crude	FCC	Delayed Coker	Diesel	Dehydro.iC4 MTBE Hydrogen
	PETROBRAS San Josè dos Campos	241000	Topped Crude	FCC		Kerosene Diesel	Dehydro.iC4 MTBE Hydrogen
CHILE	ENAP Talcahuano		Topped Crude	Cyclic Reforming RFCC Hydrocracker	Visbreaker Thermal Cracking	Naphtha	Asphalt
EGYPT	MIDOR Alexandria	100000	Topped Crude	CCR Reforming Hydrocracker	Delayed Coker	Naphtha Diesel	Isomerisation Hydrogen
IRAN	Teheran (TORC)	240000	Topped Crude	Semi regenerative Reforming Isomax	Visbreaking	Naphtha Kerosene Diesel	Isomerization Hydrogen Lubricants
IRAN	Tabriz (TZORC)	110000	Topped Crude	Semi regenerative Reforming Isomax	Thermal Cracking	Naphtha	Ethylene Unit Polyethylene Unit
ITALY	Agip Petroli Sannazzaro	200000	Topped Crude	Cyclic and CCR Reforming FCC Hydrocracker	Visbreaker	Naphtha Distillates	Isomerisation Alkylation Asphalt MTBE Hydrogen
ITALY	Agip Petroli Porto Marghera	80000	Topped Crude	CCR Reforming	Visbreaker Thermal Cracking	Naphtha Distillates	Isomerisation Asphalt
ITALY	API Falconara Marittima	83000	Topped Crude	Semi regenerative Reforming	Visbreaker Thermal Cracking	Naphtha Distillates	Isomerisation Gassification Hydrogen
ITALY	ERG MED Priolo	225000	Topped Crude	Semi regenerative Reforming Hydrocracking FCC		Naphtha Diesel	Alkylation MTBE
	ERG MED Melilli	238000	Topped Crude	Semi regenerative Reforming Hydrocracking	Visbreaker Thermal Cracking Delayed Coker	Naphtha Distillates	Isomerisation Deasphalting Gassification Hydrogen
ITALY	IPLOM Busalla	36000	Topped Crude	Hydrocracking		Distillates	Hydrogen

COUNTRY	COMPANY	CDU Capacity [bbl/d]	Vacuum Distillation	Catalytic Conversion	Thermal Conversion	Hydrotreat	Other
ITALY	TAMOIL Cremona	94000		Semi regenerative and CCR Reforming Mid Distillates Upgrade	Visbreaker	Naphtha Distillates	Isomerisation Aromatic Saturation Hydrogen
JORDAN	Jordan Petroleum Zarqa	90000	Topped Crude	Semi regenerative Reforming FCC Hydrocracking		Naphtha	Hydrogen
LIBYA	NOC Zawyia	120000	Reduced Crude	Semi regenerative Reforming		Naphtha Kerosene	Asphalt
	NOC Sarir	10000		Semi regenerative Reforming		Naphtha	
	NOC Tobruk	20000					
	NOC Brega	8000		Semi regenerative Reforming		Naphtha	
	NOC Ras Lanuf	220000		Semi regenerative Reforming		Naphtha	Petchem. Complex
MOROCCO	SAMIR Mohamedia	125000	Topped Crude	Semi regenerative Reforming		Naphtha	Lubricants
PAKISTAN	Attock Rawalpindi	35000	Reduced Crude	Semi regenerative Reforming			Asphalt
PHILIPPINES	Caltex Batangas		Topped Crude	FCC		Naphtha Diesel	
PORTUGAL	Galp Energia Leca da Palmeira	91000	Topped Crude	Semi regenerative et CCR Reforming		Naphtha Distillates	BTX Lubricants
SPAIN	Repsol YPF Tarragona	160000	Topped Crude	Semi regenerative Reforming Hydrocracker	Thermal Cracking	Naphtha Kerosene HVGO	MTBE Hydrogen
TUNISIA	STIR Bizerte	34000		Semi regenerative Reforming		Naphtha	
UK	Petrochem Carless Harwich	6000					Special Fuels Blending Facilities
URUGUAY	ANCAP La Teja Montevideo	50000	Topped Crude	Semi regenerative Reforming FCC	Visbreaker	Naphtha Kerosene	Asphalt

SOFTWARE PRODUCTS

SIMRAF LP OPTIMISER

Application: Refinery Optimisation

Technical and economic simulator/optimiser for Oil refining companies: uses Linear Programming, Recursive methods, embedded plant models and short cut crude Oil characterisation. It supports Multi-period and Multi-refinery modelling options.

- Through an intuitive object-oriented user interface, managers can operate directly without data processing experts' help. Optimisation reports are self-explanatory and intuitive.
- Refinery models are rapidly built by either Prometheus experts or the refinery technicians after a short training program.
- A Plants Library is available, including short cut simulators of principal processes and investment data for investment evaluations
- Allows assessing the economic convenience and the impact of new investments on product quality.

SIMRAF is also a powerful tool to monitor plant yields, consumption and losses and evaluate mass balances and production budgets.

OTTMIX BLENDING OPTIMISER

Application: Blending Optimisation

Linear Programming Blending Optimiser: allows preparation of the best blending recipe for finished products on a day-by-day or week-by-week basis, according to the qualities of available streams and market prices. The tool also enables the application of mixed Integer Programming optimisation techniques.

CUTS CRUDE OIL MANAGER

Application: Crude Oil Data Managing

Crude Oil Database manager and Builder: allows conversion of crude assay data and distillation TBP curves from and into any format. In its database CUTS characterises crude oils by narrow cuts (pseudo-components).

- The tool accurately calculates distribution curves for 35 fundamental characterisation properties: other properties are correlated to these.
- Irrespective of source, form, units and consistency of the available input assay, once entered into CUTS, each crude is always converted into a library of congruent and reliable data and can be queried for all appropriate properties of any fraction. Queries can be executed within the program environment or outside (e.g. from MS Excel spreadsheets).
- CUTS allows predicting real distillation yields and qualities, using a fractionation efficiency parameter for each plant output.

PROLAV
PROCESS PLANTS SCHEDULER

Application: Refinery Plants Scheduling

This tool is applied to schedule refinery processing operations. The user can calculate the foreseen sequence of refinery crude Oil tanks' processing to evaluate the impact on the intermediate and finished products inventories and issue operating instructions for the plant managers. PROLAV uses the Crude oil characterisation database produced by CUTS and the same process simulators available in SIMRAF.

This tool calculates all refinery streams' yields and quality, mass and utility balances, and controls the intermediate stocks and hydrogen balance.

PRORAF
LOGISTICS SCHEDULER

Application: Logistics Scheduling

According to the crude oil supply program and operational constraints, this tool simulates the crude oil logistics from maritime terminal/pipeline to intermediate tank farms.

Crude characterisation data are made available in the modelling environment to track the crude oil batches' evolving quality and target the quality in optimised blending.

PRORAF calculates the crude oil blend for each tank feeding the refinery. It can be linked with the other tools (PRORAF, CDU.SCHED, SIMRAF) to exchange the quality and the composition of the crude tanks available for processing.

CDU.SCHED
TOPPING OPERATOR'S GUIDE

Application: Distillation Unit Simulation

This tool supports Crude Distillation Unit management for troubleshooting and operator training purposes.

The operator can set the feed composition, product qualities, and process variables in the user-friendly wizard mode. Functions are available to manage feed tank stratification issues.

After defining feedstock quality and operating parameters, and production targets, the tool transmits data to process simulators and automatically builds a process simulation and calculates the parameters necessary to obtain Max Energy Saving.

CDU.SCHED uses the CUTS database and can be linked to PRORAF.

EPM
ENERGY PERFORMANCE MONITOR

Application: Energy Performance Monitoring

It supports the daily monitoring of the refinery operation's alignment with the best possible processing according to the process design conditions, the maintenance plant status, the atmospheric conditions of the season, the plants processing severity, and the fuel used in the burners.

With a simple input of crude oil qualities, plants condition and season, the model calculates all the need of heat, steam, cooling water, and energy requested with the plants operated at the design conditions. It measures and the potential savings obtainable if correcting the actual conditions to optimise the consumption. It also estimates each furnace's actual efficiency and boilers of the refinery and the chromatographic composition of the fuel gas in the refinery network and the flare.

SERVICES

Training
- Technical - Economic Fundamentals of Oil Refining Industry
- Training of Refinery Staff to autonomously build, maintain and analyse the solution of optimisation models: long, medium and short term planning, investments and market studies.
- Process Design and Simulation of Refining Units.

Contracts of Permanent Assistance
- Support to refinery Plant Departments.
- Support to refinery Planning Department.
- Support for production re-tuning, in order to meet more restrictive quality specifications.
- Resettlement of refinery organisational structures.
- Internet and on-site Technical Assistance.

Feasibility Studies of New Technological Cycles and Investment Programs
- Preliminary process design for plants de-bottlenecking.
- Improvements for refinery energy saving.
- Accurate evaluation of investment and operational costs for the designed modifications.

Process design
- Prometheus is specialised in **improving products quality and plants re-structuring, minimising investment costs**.
- Production of Process Books, P & I D, Preliminary Plot Plans.
- Calculation of thermal and mass Balances and main equipment sizing.
- Definition of process technical specifications and utilities consumption.

New formulations of products
- Prometheus formulated new products on behalf of its clients, such as **Ecoden** and **Ecofuel**, marketed by IPLOM refinery.

On line simulation Contracts for day-by-day plant operations
- Prometheus offers a continued assistance to Short Term Planning and Refinery Operation Departments, calculating and delivering on the Internet a **report with the optimal operating parameters** for a given plant in given conditions (change of feed quality, plant severity, etc.).
- The **long-demonstrated accuracy of calculated process conditions and product qualities**, verified by comparison with actual plant data, gives to refinery operators **confidence to follow the received suggestions**, drastically **reducing the transition time and quality give-away** between different processing stages.
- Prometheus offers this service at **the most competitive rates:** our priority is to understand the refinery needs, initiating a co-operation which often leads to projects for profitability improvement.

MAIN WORKS

FEASIBILITY STUDIES AND INVESTMENT EVALUATIONS

2019-21 **AGENCE NATIONALE POUR LA MATRISE DE L'ENERGIE (ANME)**
end user
Bizerte Refinery. (Tunisia)

The Tunisian government decided to entrust a 360 degrees study focused on the energy sector to identify strategies to supply the country energy demand at horizon 2030-2040. Prometheus is the member of the project consortium entrusted for the study of the oil downstream sector.

The TOR foresee the execution of two steps:

Pre-feasibility study: comparison of alternative refining capacities and processing schemes with crude oils available in the Mediterranean area

Detailed Feasibility study: an in-depth analysis of the selected configuration with the selected crude oils

2018-19 **MAIRE KT**
end user
Mongol Refinery (Mongolia)

The Mongolian Government has awarded MAIRE KT to execute a Due Diligence on the detailed feasibility study concerning the construction of a new refinery and a new crude pipeline.

In this framework, Prometheus worked as a subcontractor and studied all the technical aspects of Market Study and alternative Processing configurations modelling and analysis to validate results.

2018 **PCS Consulting**

The study is aimed to disprove the origin of Gasoil cargoes from a specific refinery assuming the processing of local feedstock and given processing facilities.

The study has been carried out with Prometheus Simulation Tools and Multi-Variate Analysis Tools.

2016 **STIR**
Bizerte Refinery. (Tunisia)

Consulting activities for the assessment of the process specification of the new atmospheric distillation column in view of the replacement of the existing one.

2011 **STIR**
Bizerte Refinery. (Tunisia)

Study of refinery profitability with new crude oils.

2009 **STIR**
Bizerte Refinery. (Tunisia)

Energy Audit. Revamping of Topping Unit: study of the profitability and evaluation of investments involved by alternative process configurations.

2005 **NOC**
National Oil Co. (Libya)

Product Prices Cost Procedure and incentives for Refineries profitability improvement

2004 **ASORC**
Asyut Refinery (Egypt)

Process Improvement for Refinery Optimisation: general Survey for Refinery profitability improvement

FEASIBILITY STUDIES AND INVESTMENT EVALUATIONS

2003	**CORC** *Tanta Refinery (Egypt)*	Process Improvement for Refinery Optimisation: general Survey for Refinery profitability improvement
2003	**CORC** *Mostorod Refinery (Egypt)*	Process Improvement for Refinery Optimisation: general Survey for Refinery profitability improvement
2003	**APC** *Alexandria Refinery (Egypt)*	Process Improvement for Refinery Optimisation: general Survey for Refinery profitability improvement
2003	**APRC** *Alexandria Refinery (Egypt)*	Process Improvement for Refinery Optimisation: general Survey for Refinery profitability improvement
2002	**NPC** *Suez Refinery (Egypt)*	Process Improvement for Refinery Optimisation: general Survey for Refinery profitability improvement
2002	**SOPC** *Suez Refinery (Egypt)*	Process Improvement for Refinery Optimisation: general Survey for Refinery profitability improvement
2000	**IES** *Mantua Refinery (Italy)*	Study to adapt the refinery to European specifications for years 2000 and 2005
1998	**IPLOM** *Busalla Refinery (Italy)*	Process innovations due to new European Motor gasoline and Distillates specifications 1998
1994	**IES** *Mantua Refinery (Italy)*	Technical and economic evaluation of the refinery and preparation of an investment program for a technological updating of plants and logistic structures and for energy saving .
1991	**IPLOM** *Busalla Refinery (Italy)*	Simulation of the use of crude oils and products storage in order to plan new investments.
1991	*Odessa Refinery (Ukraine)*	Feasibility study of new Desulphurisation units for kerosene and gas oil. Products quality, environmental impact and emissions were required to be compatible with the tourist ambitions of the town.
1990	**IPLOM** *Busalla Refinery (Italy)*	Modelling of refinery for the investments planning.
1988	**IPLOM** *Busalla Refinery (Italy)*	Modelling of the refinery economic results as a means of economic and financial estimate.
1988	*Public Administration*	Assessment of the impact of the government decision to renounce to use nuclear energy in Italy on the National Energy Plan.

CONCEPTUAL DESIGN ACTIVITY

2015	**ARCHA Laboratories** *Research Institute (Italy)*	Construction of a Pilot Plant to simulate an industrial water / solvent distillation process
2010	**STIR** *Bizerte Refinery. (Tunisia)*	Study for Topping Unit Revamping aimed to the improvement of energy performance and of production quality.
2010	**STIR** *Bizerte Refinery. (Tunisia)*	Study for refinery utilities and general services optimisation and balancing.
2009	**STIR** *Bizerte Refinery. (Tunisia)*	Study for Reforming Unit Revamping aimed to the extension of furnace capacity.
2005	**IES** *Mantua Refinery (Italy)*	Study for creation of improved Short cut Simulation Models for Thermal Cracking and Mild Hydrocracking.
2000	**IES** *Mantua Refinery (Italy)*	Restructuring of a Distillate Catalytic Desulphurisation unit to more severe operation
2000	**IES** *Mantua Refinery (Italy)*	Restructuring of a Deisohexaniser distillation column aimed to the change of reboiler heating medium from hot oil to hot water
1998	**IES** *Mantua Refinery (Italy)*	Restructuring of Topping units with thermal cycle splitting
1997	**IES** *Mantua Refinery (Italy)*	Restructuring of Visbreaking and Thermal Cracking units in order to reduce the coal formation and to increase the conversion capacity.
1997	**IES** *Mantua Refinery (Italy)*	Revamping of the Topping thermal integration capacity with the Hot Oil Circuit.
1997	**IES** *Mantua Refinery (Italy)*	Revamping of the Hot Oil Circuit.
1997	**IES** *Mantua Refinery (Italy)*	Revamping of the Mantua District Heating Circuit.
1996	**IES** *Mantua Refinery (Italy)*	Modifications to the refinery Light Ends Treatment Plant in order to allow the production of low benzene gasoline with improvement of energy recovery in Unifying and Reforming Plants.
1996	**IES** *Mantua Refinery (Italy)*	Transformation of a once through Isomerisation into an Isomerisation with recycle.
1994	**IPLOM** *Busalla Refinery (Italy)*	Design of the refinery Sour Water Stripper.
1994	**IPLOM** *Busalla Refinery (Italy)*	Restructuring of Topping units with thermal cycle splitting and installing of a pre-flash column.
1993	*Our research*	Design of a pilot plant for the production of active coals.
1993	*Our research*	Development and registering of Multifiner plant

CONCEPTUAL DESIGN ACTIVITY

1992	**IPLOM** *Busalla Refinery (Italy)*	Restructuring of Main Topping units oriented to energy saving and plant capacity improvement.
1991	**IPLOM** *Busalla Refinery (Italy)*	Process design of the Refinery Light ends Stabilizer.
1991	**IPLOM** *Busalla Refinery (Italy)*	Process design of the revamping of the Vacuum unit and of a Temperate Water System.
1990	**IPLOM** *Busalla Refinery (Italy)*	Process design of a Thermal Cracking unit.
1990	**IPLOM** *Busalla Refinery (Italy)*	Process design of a Distillate Desulphurization unit.
1989	*Municipality of Genoa*	Feasibility Study and Preliminary Design of a new System of Petrochemical Storage Genoa Port.
1989	**IPLOM** *Busalla Refinery (Italy)*	Process design of a new Vacuum Distillation unit.

LONG TERM ASSISTANCE

2020	**Mongol Refinery** *"Mongol Refinery" State Owned LLC*	Owner's engineer services to support the client during the preliminary construction phases (basic engineering, feed, technology selection, EPC bidding) of Sainshand Refinery.
2002	**EGPC** *Egyptian General Petroleum Corporation*	Crude oil refining in Egypt: production optimisation and management training. Project partially supported by the Italian Ministry of Productive Activities
1995	**IES** *Mantua Refinery (Italy)*	Long term contract of managerial advice and technical assistance.
1993	**IPLOM** *Busalla Refinery (Italy)*	Long term contract of managerial advice and technical assistance

TECHNICAL AND COMMERCIAL PROMOTION

1991/94	*Vostochny (Russia)*	Preliminary design of a new Oil Port designed by ANSALDO Industry S.p.A. with the collaboration of CODEST Engineering.
1991	*Ministry of Oil and Vnipinefte Chemistry URSS*	Organisation with the Institute of Moscow of a Symposium on Refinery Optimisation, during which the techniques and services offered by K.T.I. Italiana S.p.A., GLITSCH Italia S.p.A. and ANSALDO group were presented.
1989/92	*Regional Council of Odessa (Ukraine)*	New Water Supply Plant for the Region of Odessa designed by ANSALDO Industry S.p.A.
1989	*Ufa Refinery (Russia)*	Revamping of Vacuum unit made by GLITSCH Italia S.p.A.
1989	*Odessa Refinery (Ukraine)*	New Kerosene and Gas Oils Desulphurization plant, built by CTIP S.p.A. of Rome.