

ASPROFOS ENGINEERING S.A.

Permitting, Safety and Environmental Engineering Solutions





1. Identifying ASPROFOS

2. ASPROFOS Services

3. Why ASPROFOS ?

4. Successfully Executed Projects



- ✓ The **largest** engineering consultancy company in Greece
- ✓ Established in **1983** as a JV between Hellenic Aspropyrgos Refinery and Foster Wheeler Italiana
- ✓ Belongs to the Hellenic Petroleum Group of Companies
- Provides engineering and consultancy services predominantly in the Oil & Gas Sectors
- Provides economical solutions that cover clients' project needs

Identifying ASPROFOS –

Organization





Identifying ASPROFOS –

Fields of Expertise















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Overview

- ✓ Authorities Engineering and Stakeholders' Engagement
- ✓ Safety Studies
- Environmental and Social Impact Assessment (ESIA), from Feasibility level to Reviewing services, incl. IPPC Studies
- ✓ Landscape Studies
- ✓ Wastes Management
- ✓ Health, Safety and Environment Management Systems

Additionally, services offered include:

- GIS and Remote Sensing for ESIA and Environmental Monitoring
- ✓ Research for European Programs
- Compilation of Technical Expert's Report

Services provided are in full:

- ✓ Compliance with National and International Legislation
- ✓ Compliance with EBRD and WB financing performance requirements





Authorities Engineering & Stakeholders' Engagement

Services offered:

- ✓ Issuance of Installation and Operation Licenses, Power Production Licenses, Environmental License
- Contact with Ministerial, Regional and Municipal Authorities, Decentralized Administration, NGOs, CSOs, Institutes and Third Parties
- Investigation of Engagement with Regional Plans, Land Uses, Development Plans (existing and future), Cultural Heritage, Social and Environmental Constraints
- ✓ Land and Easement Acquisition Consulting, incl. Cadastral Studies and Expropriation Procedure
- ✓ Financing Documentation Preparation
- Consulting for Concession of Use for Seashores and Coastal Areas
- ✓ Site Visits and Follow up of permits issuance
- Project's Disclosure and Public Consultation





O Asprofos

Safety Studies

O Asprofos engineering

- ✓ Internal Contingency Plans
- ✓ SEVESO II, HAZOP, SIL etc.
- ✓ Explosion Protection Documents (EPDs) and Drawings (ATEX)
- ✓ Hazardous Chemicals Management Studies
- ✓ System & Documentation of Health and Safety Preparation
- ✓ Installation & Personnel Security Studies (SECURITY SYSTEMS)
- ✓ Fire Prevention Studies and Fire Fighting Studies
- ✓ Natural Gas Pipeline Systems Safety Studies
- ✓ Risk Management
- ✓ Safety and Risk Assessment Study (incl. population density data, QRA calculations)

Environmental and Social Impact Assessment

- Elaboration of Environmental and Social Impact Assessment
- ✓ Strategic Environmental Impact Assessment
- ✓ Feasibility studies
- Preliminary Identification of Environmental Requirements (Scoping Report)
- ✓ Application file for Renewal and/ or Amendment of Environmental Terms
- ✓ Application file for Forest Characterization Act
- ✓ Social and Environmental Investment Plans
- Environmental Legislation / Environmental Consulting Services
- ✓ Drafting of Environmental Terms
- Baseline data collection activities incl. Onshore and Offshore Natural, Social and Cultural Environment
- ✓ Dispersion Models Aerial, Noise, Water
- ✓ GIS Mapping of Environmental Constraints







Landscape Studies

- ✓ Zone of Visual Influence
- ✓ Photorealistics
- ✓ Special Logging Studies
- ✓ Replantation Studies
- ✓ Landscape Reinstatement Studies







Wastes Management

- ✓ Liquid Wastes Management Study
- ✓ Solid Wastes Management Study
- ✓ Hazardous and Toxic Wastes Management Study
- ✓ Wastes Management Technology Selection
- ✓ Wastes-to-Energy Engineering Support (incl. Energy Efficiency)
- ✓ Wastes Treatment Facilities Design
- ✓ Facilities Construction Supervision

Health, Safety & Environment Management Systems



- ✓ Application of Environmental Management Systems EMAS
- ✓ Application of ISO 14001 in Industrial Systems (Oil, Gas and Refinery Sectors)
- ✓ OHSAS 18001 (Occupational Health and Safety Management Systems)
- ✓ HACCP (Hazard Analysis and Critical Control Points)
- ✓ Hazardous Chemical Substances Management Systems
- Other Environmental Management Systems (i.e. Port Environmental Review System - PERS)

ASPROFOS Services – Expert's Report

- ✓ Compilation of Technical Statement and Expert's Report
- ✓ Consulting services for preparation of Project's Owner representative before
 - Courts (National and European)
 - Meetings with Public and Social Entities
 - Meetings with Stakeholders and the Public
- ✓ Project's Technical Consultant providing evidence before:
 - Courts (National and European)
 - Regional and Municipal Councils
 - Public Disclosure to Stakeholders and the Public







Software and Application

- ✓ Utilities Packages (MS Office, etc)
- ✓ Specialized Software, including:
 - AFT Fathom
 - Design II
 - Aspen HYSYS
- ✓ Computer and Graphic Aided Design, including:
 - Autocad
 - Corel Draw
 - Photoshop
- ✓ Geographical Information Systems & Remote Sensing
 - ArcGIS
 - Autocad Map
 - Google Earth Pro







GIS and Remote Sensing



Application in:

- ✓ Data Collection and Geodatabase Structure and Management
- ✓ Image processing, interpretation and remote sensing
- Site investigations and characterizations
- ✓ GIS Mapping of Environmental Constraints
- ✓ Environmental Monitoring (incl. Landuse/ Landcover analysis and assessment).
- ✓ Emergency planning and monitoring
- ✓ Route and corridor selection
- ✓ Water and power plant site selection
- ✓ GIS modeling for prediction of potential impacts
- ✓ GIS in decision making Applied Spatial Analysis
- ✓ Web Mapping Services





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Why ASPROFOS –

Successful Engineering Solutions



- > Extensive know-how in all phases of high complexity projects
- Highly skilled and experienced personnel
- Flexible structure that enables the successful management of a wide variety of projects
- Focus on understanding and meeting the specific needs of each customer
- Provider of services in cooperation with the Hellenic Petroleum Refineries, such as on the job training, best practices etc.
- ISO Certified:
 - ✓ BS-EN-ISO 9001:2008 for Quality Management System
 - ✓ BS EN ISO 14001:2004 for Environmental Management System
 - ✓ OHSAS 18001:2007 for Occupational Health & Safety Management System
 - ✓ ELOT 1429:2008 for Managerial Capability System (Hellenic Organization Standardization)
- Offering of one-stop-shop services, from permits to start-up





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Overview



List of sample projects in:

- Safety Studies
- Environmental Studies
- Landscape Studies
- HSE Management Systems
- Technical Expert's Report
- Key References

Sample Projects on Safety Studies



- Aspropyrgos Refinery (HAZOP, SEVESO II, EPD, Area Classification, Fire Protection Studies, 1995present) [HELPE S.A.]
- Thessaloniki Refinery (Area Classification, Fire Protection Study, 2007-2010) [HELPE S.A.]
- Elefsina Refinery (SEVESO II, HAZOP, EPD, Area Classification, 2008-2013) [HELPE S.A.]
- Megara Tank Farm (Area Classification, SEVESO II study, 2008-2013) [HELPE S.A.]
- Revithousa LNG Terminal Station (SEVESO II, Fire Protection Study, 2011) [DESFA S.A.]
- VTTV Tank Farm, Vassiliko, Cyprus (Fire Protection Study, Area Classification, 2011-present) [VITOL S.A.]
- Aspropyrgos Refinery Athens International Airport Fuel Pipeline, 2003 [HELPE S.A.]
- VPI Factory, Volos, 2007 [VPI S.A.]
- Agia Triada Revithousa Island Undersea Natural Gas Pipeline (Internal Contingency Plan, 2003) [DESFA S.A.]
- Revithousa 15.5 MW CHP Unit (Fire Prevention Study, 2006) [DESFA S.A.]

Sample Projects of Environmental Studies (a)



- E.S.I.A for Transadriatic Natural Gas Pipeline TAP (2012 present) [ENT]
- Strategic Environmental Impact Assessment for High Pressure Natural Gas Pipelines (2011) [DESFA]
- Aspropyrgos Refinery (various EIA) (1995 present) [HELPE S.A.]
- 390 MW Power Production Unit of HELPE in Thessaloniki (EIA, Liquid Waste Study) (2002) [THESSALONIKI POWER S.A.]
- Authorities Engineering for Power Production Units in 5 Aegean Islands (Installation and Operation Permits, ESIA) (2014 – present) [PPC SA]
- Natural Gas Pipeline Main pipe, branches of 3000km length, LNG installations (EIA) (1992 present) [DEPA, DESFA S.A.]
- Burgas- Alexandroupoli Crude Oil Pipeline (2009) [DEP-THRAKI S.A. & I.L.F]
- E.I.A. for the Eleusis Refinery Upgrade Project (2008-2013) [HELPE S.A.]
- E.S.I.A and Feasibility Studies for the offshore High Pressure Natural Gas Pipeline of Interconnector Greece – Italy Project (2006 – 2012) [POSEIDON]



- Technical and Financial Feasibility Study for Connecting Malta to European Gas Network (2014) [Equinox Advisory Ltd, on behalf of the Maltese Ministry of Energy and Health]
- E.S.I.A. for LNG Terminal Cryogenic Facilities and its expansion (2002 2013) [DEPA, DESFA S.A.]
- Technical-Financial Study for the Reduction of Waste Emission from the ELDA, EKO, MOTOR OIL, PETROLA Refineries (2006) [PERPA]
- 15.5 MW CHP Unit on Revithousa Island (EIA) (2005) [DEPA S.A.]
- E.S.I.A. for 16" White Products Pipelines (2009-2013) [HELPE S.A]
- E.I.A. for Kerosene Pipeline from HELPE Aspropyrgos refinery to Spata Airport (2000) [AIA S.A.]
- Feasibility study for LNG Terminal at Kavala area (2009) [DEPA S.A.]
- E.S.I.A. for Biogas Power Plant 4.6 MW at Tychero Evrou (2012) [HELPE Renewable S.A.]
- E.S.I.A and Licensing for various Photovoltaic Arrays in Greece (2011-2012) [HELPE Renewable S.A.]
- Environmental Consulting for Cyprus Energy Regulatory Authority for Power Plants, Wind Farms, LNG Floating Power Station (2005) [E.A.C.], (2007) [CERA]

Sample Projects of Landscape Studies



- ✓ Special Logging Studies for:
 - the HP NG Pipeline 'Stefani-Barnabas-Aliberi' (Prefectures of Attiki, Viotia and Evia -2010)
 - Korintho's branch HP NG Pipeline (2006) [DEPA DESFA S.A.]
- ✓ Replantation Studies for:
 - Korintho's branch HP NG Pipeline (2006)
 - Distomo's branch HP NG Pipeline (2007)
 - ADG's branch HP NG Pipeline (2007)
 - the Main HP NG Pipeline (1996-2000) [DEPA - DESFA S.A.]
- ✓ Reinstatement Study for:
 - the Main HP NG Pipeline (1996-2000) [DEPA DESFA S.A.]
 - the Main HP NG Pipeline in Platamonas' Special Area (2009) [DESFA S.A.]
- ✓ Photorealistics and Zone of Visual Influence for two Compressor Stations for TAP (2013) [ENT AG]
- ✓ Photorealistics for the Construction of the 3rd LNG tank in Revithousa Island (2011) [DESFA S.A.]



Sample Projects of Waste Management



- Oily water collection tank P89-10 at Megara Industrial Compound (2009) [HELPE S.A.]
- Waste water treatment plant for U-7.0 & U-83 at Elefsina Industrial Compound (2012) [HELPE S.A.]
- Waste water treatment plant for U-5500 at Aspropyrgos Industrial Compound (2012) [HELPE S.A.]
- Biogas Cogeneration Unit 2,4 MWe at Arta (2011) [Agricultural Association of Arta]
- Biogas Power Plant 2 MWe at Kilkis (2012) [GDK S.A.]
- Biomass Power Plant 4,68 Mwe at Tychero (2012) [HELPE Renewables S.A.]



Sample Projects of HSE Management Systems



- Development of EMAS Environmental Management System for the Aspropyrgos Refinery (2003-2009) [HELPE S.A.]
- Development of Environmental Management System for the Port of Piraeus (2004) [PPA S.A.]
- Compilation of Environmental Regulation for the Port of Piraeus (HGG 1389/B/10.09.2004) [PPA S.A.]
- Burgas Alexandroupoli Crude Oil Pipeline (Environmental Policy, Environment Management Procedures) (2009) [TBP S.A.]
- Implementation and maintenance support of ISO 14001 and OHSAS 18001 Management Systems at HELPE Aspropyrgos and Eleusis Refineries (2010-2013) [HELPE S.A.]
- Implementation of ISO 14001 and OHSAS 18001 Management Systems at HELPE Head Office (2013) [HELPE S.A.]

Sample Projects of Technical Expert's Report



- For the HP NGP "Stefani Varnavas Aliveri", before the Council of State, supporting the Project's :
 - ✓ Environmental Terms Approval
 - ✓ Installation Permit (2011) [DEPA S.A.]
- For the Main HP NGP Keratsini Branch, before the Council of State supporting the Project's Environmental Terms Approval (1994) [DEPA S.A.]
- For the Main HP NGP Korinthos Branch, before the Council of State, supporting the Project's Environmental Terms Approval (2000) [DEPA S.A.]
- For the Power Plant of 390 MW in Thessaloniki's Industrial Compound, supporting the Project's Environmental Terms Approval, before:
 - ✓ the Council of State
 - ✓ the European Court of Justice (2005) [ELPE S.A.]





KEY REFERENCES - Main National High

Pressure Natural Gas Transmission System



Main National High Pressure Natural Gas Pipeline and branches

Size / length: 36'' / 104 km and 30'' / 411 km : Total 515 km (including the construction of 32 Scraper and Line Valve Stations) and 17 Branches of 790km in total ranging from 10'' - 36'' and from 70 - 150 barg

Services Rendered:

- Basic and Detailed Design,
- Services on Safety,
- Specialized Seismic Studies
- Environmental Impact Studies
- Stakeholders Engagement and Permits Acquisition,
- Construction Management and Construction supervision Services
- Contract Administration Services,
- Services on Quality Matters,
- Close Out Activities,
- Final Documentation packages

Client: Public Gas Corporation of Greece – DEPA S.A.

Location: Main Pipeline routing begins from the Greek-Bulgarian Border and ends in the Attica area, while the branches start from main pipeline towards various cities of Greece.



KEY REFERENCES - Main National High

Pressure Natural Gas Transmission System



Above Ground Installations

- ✓ 1 Compressor Station
- ✓ 2 Border Metering Stations
- ✓ 42 Metering, Regulating, M/R Stations

Services Rendered:

- Stakeholders Engagement and Permits Acquisition
- Safety Studies,
- Environmental Impact Assessment
- Basic Design,
- Technical Evaluation of Bids,
- Review of Contractor's Detailed Engineering,
- Construction Management and Construction Supervision Services,
- Contract Administration,
- Quality Services,
- Close Out Activities

Clients: Public Gas Corporation of Greece - DEPA S.A., Hellenic Gas Transmission System Operator - DESFA S.A. **Location:** Greece





KEY REFERENCES – Transadriatic High

Pressure Natural Gas Pipeline



Size/ length: 48"/ [550 + 215] km (95 barg). [23 + 9] Block Valve Stations. [2 +1] Compressor Stations

Services Rendered:

- Stakeholders Engagement Activities (GR)
- Basic Design (GR & AL),
- Safety Study (GR)
- Baseline data collection activities (GR), incl.
 - Abiotic parameters (air, water, soil, landscape) & Biodiversity (flora and fauna terrestrial and aquatic) surveys,
 - Socioeconomic (household survey, cultural heritage resources)
- Environmental and Social Impact Assessment (GR), incl.
 - Appropriate Assessments
 - Air Dispersion Model
 - Noise Emission Model
 - Zone of Visual Influence and Photorealistic
- ESPOO Report (GR)
- ESIA Consultation and Public Disclosure (GR)
- TAP Permitting in Greece and Albania

Clients: TAP AG, ENT

Location: From Greek-Turkish Border to Greek-Albanian Border.





KEY REFERENCES – High Pressure Natural Gas

Pipeline 'Stefani-Varnavas-Aliveri'



Size / length: 20" / 72 km (14,2 km offshore). 5 Scraper and Block Valve Stations. 2 Metering Stations.

Services Rendered:

- Stakeholders Engagement and Permits Acquisition,
- Basic and Detailed Design,
- Specialized Seismic Studies
- Safety Studies
- Environmental Impact Studies
- Special Logging Studies
- Construction Management and Construction supervision Services
- Contract Administration Services,
- Services on Quality Matters,
- Experts' Report in the High Court
- Close Out Activities,
- Final Documentation packages

Client: Hellenic Gas Transmission System Operator - DESFA S.A..

Location: Prefectures of Attica, Viotia and Evia



KEY REFERENCES – Offshore Interconnector

Greece - Italy

O Asprofos engineering

anyon (C1) head scan

Scale shown I

Size / length: 32" / 146 km (8 km onshore – 136 km offshore), 140 barg. 1 Block Valve Station and 1 Compressor Station

Services Rendered:

- Stakeholders Engagement and Contact with Authorities
- Specialized Seismic Studies
- Environmental Impact Study
- Air Dispersion Model
- Permits Acquisition,
- ESPOO Report

Client: Public Gas Corporation of Greece – DEPA S.A.

Location: Greece (Epirus)





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KEY REFERENCES – Burgas/ Alexandroupolis Crude Oil Pipeline



Size / length: 42" / 125 km. Tankfarm: 95 ha, 1.200.000 m³. Onshore Facilities and 2 SPM at 11 km distance from the shore

Services Rendered:

- Stakeholders Engagement
- Permits Acquisition
- Route Refinement
- Consulting Services
- Documents Review
- Environmental Impact Study, incl. HV Transmission Line
- Wastes Management Plan for Tankfarm
- Oil Spill Scenario
- Appropriate Assessment
- Air Dispersion Model
- ESIA Public Consultation
- ESPOO Report

Client: DEP Thraki, TBP, ILF **Location:** Greece, R. of Evros.







KEY REFERENCES – HELPE Elefsina's Refinery Upgrading Project



Upgrading works for optimization of refinery production with simultaneous increase in white products, minimization of wastes and enhancement of safety. Budget: 1,200 million Euros. **Services Rendered:**

- Engagement in Front End Engineering Design
- Detailed Design of Crude Distillation unit revamp
- Detailed Design of offsites facilities with change of service in storage tanks and pumping networks
- Detailed Design of Waste Water Treatment unit, Nitrogen unit, Water Demineralization unit
- Preparation of Environmental Impact Study
- Preparation of Fire Fighting protection study,
- Preparation of a SEVESO type Safety Study
- Handling the construction permitting issues
- Participation in construction supervision

Client: Hellenic Petroleum S.A.

Location: Attica, Elefsina



KEY REFERENCES – Waste water treatment plant at Aspropyrgos Industrial Compound



Process Data:

Design Flow Rate: 350m³/h. Influent Oil: Average 50 mg/l, Peak 300mg/l. TSS: Average 80mg/l.
Skimmed froth flow rate: 5-10% of incoming flow.

Services Rendered:

- Permits Acquisition
- Basic Design,
- Safety Study
- Environmental Impact Assessment
- Construction Management and Construction Supervision

Clients: HELPE s.a.

Location: Greece, Athens



KEY REFERENCES – LNG Terminal at

Revithousa Island

Size: 130.000 m³ LNG storage capacity/ 3rd tank expansion + 95.000 m³. Cogeneration Power Unit: 13 MWe

Services Rendered:

- Basic Design and Review of Detail Design,
- Stakeholders Engagement and Permits Acquisition
- Specialized Seismic Studies
- Safety Study
- Environmental Impact Assessments (incl. Initial 2 tanks and expansion, Land reclamation works, Power generation plant
- Wastes Management Study (Liquid and Solid)
- Oceanic Study for Dispersion of Cold Water
- Air Dispersion Model
- Construction Management and Supervision
- Services on Quality Matters
- Close Out Activities,
- Final Documentation packages

Clients: Public Gas Corporation of Greece - DEPA S.A., Hellenic Gas Transmission System Operator - DESFA S.A. **Location:** Greece, Revithousa Island







KEY REFERENCES – Feasibility Study for LNG Kavala



- Siting Investigation
- Feasibility Study
- Oceanographic Data report
- Contact with Authorities

Clients: Public Gas Corporation of Greece - DEPA S.A. **Location:** Greece , Municipality of Kavala









KEY REFERENCES – 390 MW Power Production Unit in Thessaloniki



Size: 390 MWe Power Plant

Services Rendered:

- Permits Acquisition
- Basic Design,
- Specialized Seismic Studies
- Safety Study
- Environmental Impact Assessment
- Air Dispersion Model
- Wastes Management Study (Liquid and Solid)
- Thermal Plume Dispersion Model Air and Water
- ESIA Consultation and Public Disclosure
- Construction Management and Construction Supervision

Clients: Thessaloniki Energy – ELPEDISON

Location: Greece, Thessaloniki



KEY REFERENCES – Power Production Plants in 5 Aegean Islands

Size: 1. 18.7 MWe in Andros Isl.

- 2. 4.2 MWe in Astypalaia Isl.
- 3. 16 MWe in Ikaria Isl.
- 4. 10 MWe in Symi Isl.
- 5. 8 MWe in Skyros Isl.

Services Rendered:

- Installation Permit Acquisition
- Operation Permit Acquisition
- Environmental and Social Impact Assessment
- Air Dispersion Model
- Noise Emulation Model
- Wastes Management Study (Liquid and Solid)

Clients: Public Power Production (PPC) SA

Location: Greece, Aegean Sea





KEY REFERENCES – Biogas Power Plant

4.6MW at Tychero



Services Rendered:

- Contact with Authorities,
- Compatibility with Special Physical Planning for Renewable Energy Sources Projects
- Baseline data collection activities, incl.
 - Abiotic parameters (air, water, soil, landscape)
 - Biodiversity (flora and fauna) surveys,
- Environmental and Social Impact Assessment
- Forest Characterization Application File
- Follow up of Environmental Terms Application

Clients: HELPE Renewables sa

Location: Greece, Municipality of Soufli



KEY REFERENCES – Photovoltaic Array 4MW at HELPE Industrial Compound of Thessaloniki



Size: 3,998 MWe. 13.328 Solar Panels. Area: 8 ha.

Services Rendered:

- Contact with Authorities,
- Baseline data collection activities, incl.
 - Abiotic parameters (air, water, soil, landscape)
 - Biodiversity (flora and fauna) surveys,
- Environmental and Social Impact Assessment,
- Forest Characterization Application File
- Follow up of Environmental Terms Application

Clients: HELPE Renewables sa

Location: Greece, Thessaloniki











THANK YOU FOR YOUR ATTENTION!

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