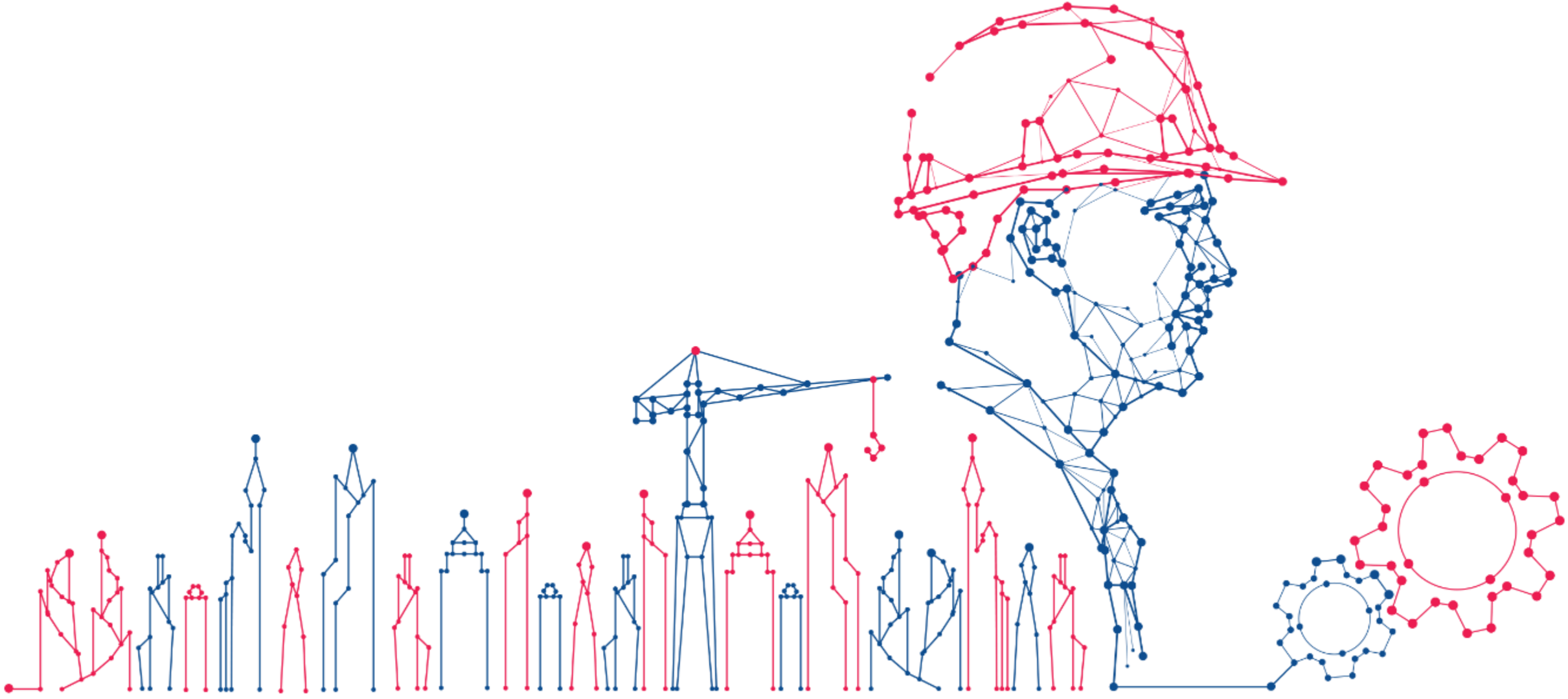
ELSACO®

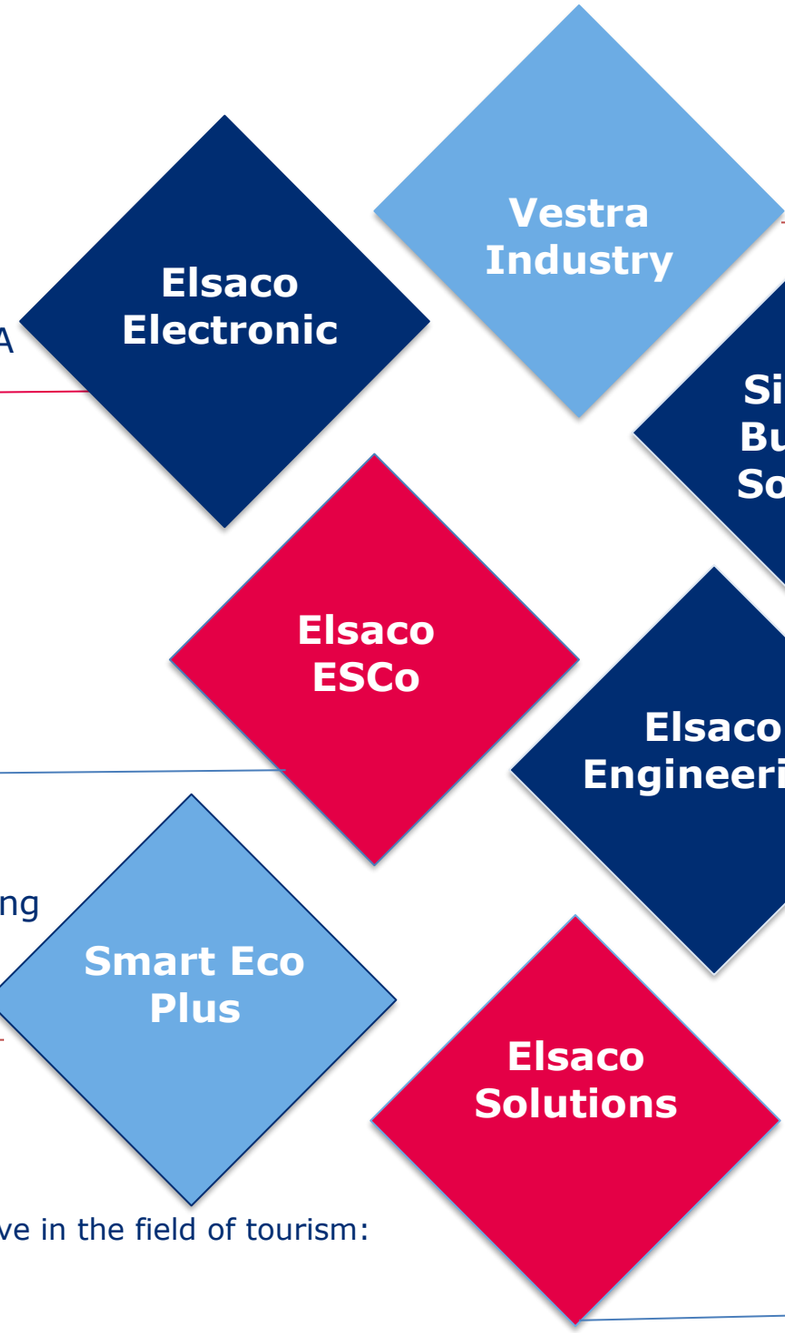


Elsaco

A strong team, united by a single vision

1994	**Year established**
600+	**Employees**
8	**Elsaco companies**
15+	**International projects**
€200 Million	**2023 Turnover**

Elsaco Group



- Equipment and products for the utility industry
- Automation systems and equipment

- Energy projects
- Hydro projects
- Automation and SCADA

- Metering data management software applications: EMMSYS, RMS, MbusNetwork, BVM
- Organizational management software applications: ELITIS, ACE, REP-ET

- Energy audit
- ESCo Projects
- Complex analysis
- Technical due diligence

- Cogeneration projects
- Hydro projects
- Civil and industrial construction

- Residential smart metering
- Installations and cost breakdown services

- Solar PV plants and Energy Storage Solutions ESS
- JINKO SOLAR distributor for PV panels and energy storage
- HUAWEI partner for inverters and energy storage
- Energy production forecast, energy trading , VPP
- ARH distribution: ANPR cameras, ID readers
- Smart metering solutions
- LoRa , NB-IoT and LTE-M modules for water and gas meters
- Distribution of tablets, IT products and services

*The Elsaco group also includes a company active in the field of tourism: Zăicești Manor

Elsaco Electronic

Elsaco Electronic, the biggest company of the group, successfully performs activities in the following fields:

Power

• urban heating systems;

• new installations for producing electricity and heat in cogeneration including biomass, biogas, municipal waste and renewable resources capitalization;

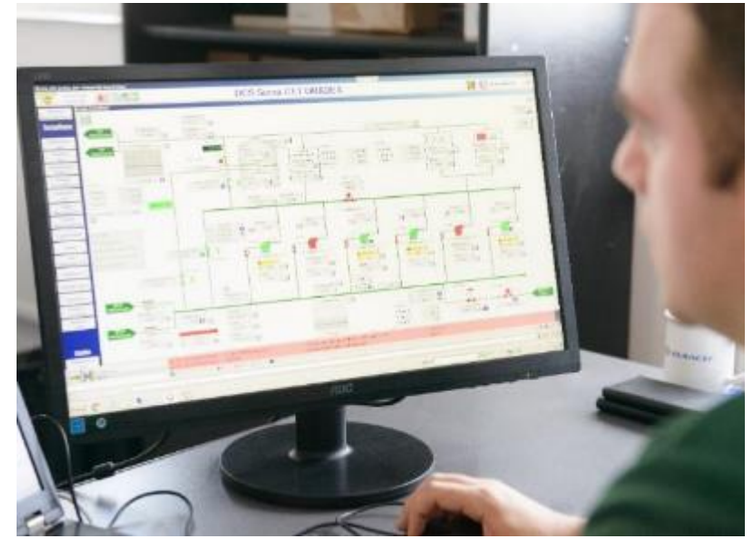
• depollution installations of flue gases in coal power plants (DeSOx, DeNOx).

Water and wastewater:

• water supply and sewage systems: water supply networks, water treatment plants, wastewater treatment plants and sludge treatment, wastewater collection and transport networks, pumping stations;

• civil and industrial constructions, including related facilities;

• irrigation systems.



Automation and SCADA

•automation and control systems for the energy, water and sewerage, industry sectors;

•AMR / AMI systems for meter reading, consumption analysis and diagnosis of utility companies;

•SCADA / DCS / Process control systems/ dispatch centers (RTU & PLC panels, servers, PC stations, communication networks, software).

Integrated Management System

Elsaco Electronic has adopted and implemented an integrated management system compliant with the reference standards and the legal requirements and regulations.
The implemented system, certified by SRAC/ IQNET, allows the company to achieve and maintain a high level of competitiveness. In order to meet our clients' expectations, in a highly competitive market, we constantly try to meet all the requirements in terms of quality, environment, pollution prevention, occupational safety and health, information security and energy management, social responsibility.

Implemented standard	Description
ISO 14001	Environmental Management
ISO/EC 27001	Information Security Management System
ISO 9001	Quality Management
ISO 50001	Energy Management
ISO 45001	Occupational Health and Safety Management
SA 8000	Social responsibility
ISO 3834-2	Quality management in the field of welding

Partners

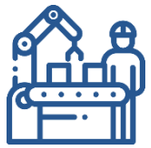
In connection with our potential partners, our policy is simple: the stability and long term partnerships are the key to long term success. By working with several worldwide companies, our team is capable of offering special technical support and the necessary know-how which is required to adopt the optimal solutions.

Clients

We take pride in a good understanding of our clients' needs and their markets. We are open, deliver on time and approach with professionalism each request we receive. Through quality and solid partnerships we succeeded to build durable relationships with each and every one of them. The main markets of our clients are:

utilities (water, heat, gas) – heating/water/gas, companies, municipalities;

power – power producers, investors in new power sources;



industry – companies with productive activities;

residential – development of residential areas, persons (apartments/houses/villas);

retail – distributors, collaborators;

constructions – contractors, subcontractors, designers.

Reference projects

We pride ourselves on a good understanding of our clients’ needs and of the markets which they develop their activity on.

Energy projects

Systems and solutions for increasing energy efficiency, dedicated to public and private companies

Combined Heat and Power Plant
CET Oradea

Customer: Oradea Municipality
Period: 2014-2016
Value: 54 million EUR

Activities:
- project management;
- obtaining approvals and authorizations;
- engineering and design;
- execution of construction and installation works;
- supply of equipment and materials;
- mechanical, electrical and automation technological works;
- personnel training, tests and PIF, performance test, spare parts.

Key elements:
- 88% overall cogeneration efficiency, 96% CAF thermal efficiency;
- 45 MWe high efficiency gas turbine (General Electric);
- 50 MWt turbine heat recovery system;
- heat accumulator of approx. 355 MWh;
- two hot water boilers of 116.3 MWt.

Rehabilitation of Heating System – Lot 2

București

Beneficiary: Bucharest Municipality
Period: 2023–2026
Value: 33.8 million EUR
Role: Leader of association

Activities:

Design and execution for the rehabilitation of the heating network related to the Grozăvești main heating network II-III:

- decommissioning of existing pipelines;
- installation of isolating valves in existing tanks;
- execution and installation of fixed and mobile supports;
- welding works, sleeves, insulation works, fittings;
- pressure tests;
- connecting the signaling wires between the pipe sections and checking their continuity;
- installation of the data transmission cable.

Rehabilitation of primary thermal networks – stage I

Constanța

Beneficiary: Constanța Municipality

Period: 2022–2023

Value: 23.3 million EUR

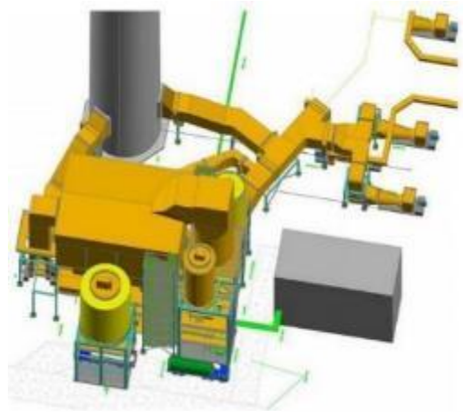
Activities:

- rehabilitation of 22 km of route belonging to the first major pipeline, as well as the connecting strap between the two major pipelines.

Key elements:

- increasing the length of the rehabilitated primary thermal networks by 43 km rehabilitated primary thermal network (22 km route);
- reduction of thermal energy losses in transmission networks by 42.311 Gcal / year (177.15 TJ/year);
- reduction of polluting emissions produced by the district heating system in Constanța.

Desulphurisation plant (FGD)
CET Iași



Customer: Iași Municipality
Period: 2014–2016
Value: 21.7 million EUR

Activities:

- general services (surveys, As-built documentation, Operating and maintenance manuals);
- design and engineering services;
- works and services associated with constructions;
- mechanical, electrical and automation technological installations;
- fire detection and signaling facilities, access control;
- supply of spare parts for 2 years;
- commissioning and personal training for the Beneficiary, Performance Tests.

- **Key elements:**

- the plant removes over 97.7% of the sulfur dioxide of the flue gases;
- concentrations of SO2 emissions in the atmosphere <50 mg / Nm3 (well below the 200 mg SO2 / Nm3 required by European standards);
- concentrations of powders emitted in the atmosphere <20 mg / Nm3;
- availability of desulphurisation plant in operation > 95%.

Geothermal energy exploitation in association with heat pumps

Oradea

Beneficiary: Oradea Municipality

Period : 2022-2024

Value: 18.1 million EUR

Activities:

- obtaining approvals and authorizations, drawing up documentation;
- construction of the transport network for thermal agent and geothermal water, over a length of approximately 22 km;
- construction of the geothermal thermal station + 2 reinjection stations;
- making a new borehole for the production of geothermal water with a depth of approx. 2800-2900 m, equipped with an extraction pump;
- the installation, at block level, of 277 mini-thermal points.

Key elements:

Economic impact

- significant reduction of fossil fuel consumption;
- reduction of production costs of the thermal agent for heating.

Social impact

- increasing the thermal comfort of the population and public institutions.

Environmental impact

- pollutant emissions released by aggregates into the atmosphere are insignificant;
- reduction of CO2 emissions by approximately 13.167 tons of CO2/year;
- noise pollution will be greatly reduced;
- thermal and chemical pollution will be zero through the re-injection of thermal waste water;
- installations using geothermal energy do not pose any risk to the environment.

Rehabilitation of heating system– Lot 5

București

Beneficiary: Bucharest Municipality
Period: 2023–2026
Value: 15.7 million EUR
Role: Associate

Activities:

Design and execution for the rehabilitation of the heating network related to the following main heating networks – II South; II-III Grozăvești; V Grozăvești; Progresu-Berceni; II West; I-II-III West:

- decommissioning of existing pipelines;
- installation of isolating valves in existing tanks;
- execution and installation of fixed and mobile supports;
- welding works, sleeves, insulation works, fittings;
- pressure tests;
- connecting the signaling wires between the pipe sections and checking their continuity;
- installation of the data transmission cable.

Secondary thermal networks rehabilitation
Timișoara

Beneficiary: Timișoara Municipality
Period: 2020–2023
Value: 14.7 million EUR

Activities:

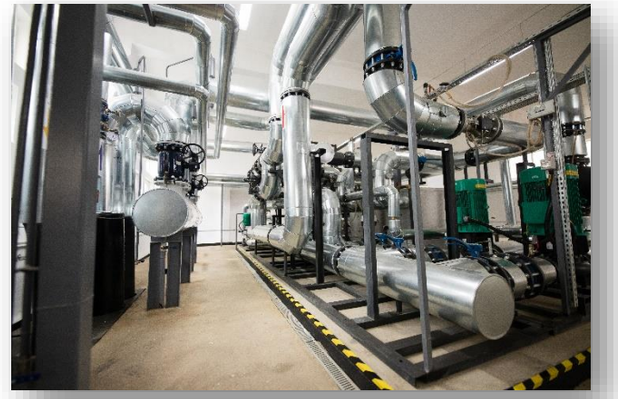
- design of secondary thermal networks in length of approx. 20 km;
- thermomechanical works to replace pipes (round-trip heating, domestic hot water, domestic hot water recirculation) located underground in thermal channels with pre-insulated pipes;

Key elements:

- making the heating system more efficient:
  - reduction of network losses;
  - an increase in the detection speed and the accuracy of locating faults in the network;
  - reduction of network maintenance and operation costs;
- reducing the negative effect on the environment and the health of the inhabitants by: reducing the amount of emissions of greenhouse gases and other pollutants, as a result of the reduction of fuel consumption.

Rehabilitation of the centralized heat supply system – Stage II

Vatra Dornei



Beneficiary: Vatra Dornei Municipality
Period: 2021–2023
Value: 11.8 million EUR

Activities:

- obtaining permits and authorizations;
- purchase of materials and equipment;
- execution of works: rehabilitation and extension of the primary thermal networks (installation of pre-insulated pipes, 58 thermal mini-points, rehabilitation of the connection sections to the primary thermal network for 6 thermal points, replacement / installation of valves), rehabilitation of 6 thermal points: construction, thermomechanical electrical and automation works;
- testing and commissioning (PIF);

Key elements:

- the pre-insulated pipes are provided with a monitoring / fault signaling system, in the thermal insulation made of polyurethane foam;
- in the thermal point are also installed the central units related to the leakage detection system through pipes for the secondary thermal network and for the sections of the primary thermal network, which will be provided with the possibility of remote data transmission.

Thermal networks and thermal points
Focșani

Beneficiary: Focșani Municipality
Period: 2019–2021
Value: 11.1 million EUR

Activities:

- technical project with execution details and documentation for the Construction Authorization;
- execution of works and commissioning of installations:
  - rehabilitation of 2.8 km thermal transport network with dimensions from DN 700 to DN 100;
  - rehabilitation of 11 km thermal distribution network with dimensions from DN 125 to DN 25;
  - rehabilitation of constructions, thermomechanical and automation works for 9 Thermal Points.

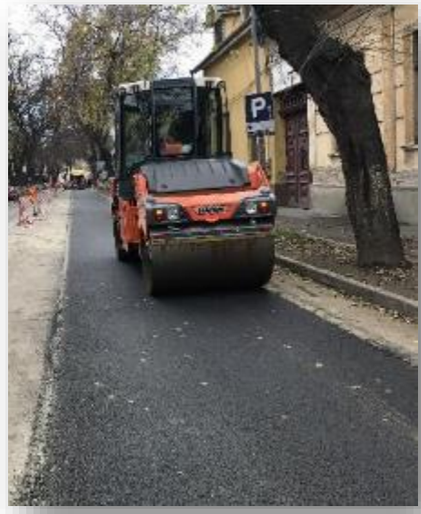
Rehabilitation of heating networks – Stage III
Constanța

Beneficiary: Constanța Municipality
Period: 2022–2024
Value: 9.2 million EUR

Activities:
- the rehabilitation of 4 km of route belonging to the first main thermal network and the rehabilitation of 3 km of the secondary thermal network;
- 24 consumers metering and balancing;

Key elements:
- increasing the length of the rehabilitated primary thermal networks by 8 km rehabilitated primary thermal network and 6 km secondary thermal network;
- reduction of pollutant emissions produced by the urban heating system in the city of Constanța;
- reducing thermal energy losses in the transport networks by 52.00 TJ/year.

Heating networks rehabilitation
Oradea



Beneficiary: Oradea Municipality
Period: 2015-2018
Value: 8 million EUR

Activities:

- replacement of pipes located underground and above ground;
- replacement of valves on the path of the DH arteries and main ramifications and connections;
- construction works;
- creating a system for monitoring the pipes insulation;
- power supply for the motor-operated valves;
- installation of a fiber optic cable for data transmission throughout the whole length of the rehabilitated network.

Rehabilitation of the transport and distribution thermal network

Arad

Beneficiary: Arad Municipality

Period: 2018–2020

Value: 6.2 million EUR

Activities:

- design services (DTAC, PTh, DE, As-Built phases);
- works to replace the thermal energy transport network (route length: approx. 4.5 km);
- works to replace the thermal energy distribution network in the Aradul Nou district (route approx. 2.0 km);
- works to transform the Thermal Point from Aradul Nou into the Thermal Power Plant: supply and installation of gas boilers (3 x 900kW), biomass-pellet boiler (1 x 150 kW).

Rehabilitation of the centralized heat supply system

Vatra Dornei

Beneficiary: Vatra Dornei Municipality
Period: 2018–2020
Value: 5.4 million EUR

Activities:

- design and execution of primary thermal network, 2.1 km long;
- design and execution works for the rehabilitation of the thermal plant on wood waste, sawdust - 12MW:
  - works for the rehabilitation of the existing building: constructions, installations;
  - works for replacement of existing boilers and pipelines with new ones;
  - replacement of existing chimneys;
  - demolition and replacement of the boiler feed system.

Thermal supply system upgrade

Gheorgheni

Beneficiary: Gheorgheni Municipality

Period: 2022-2023

Value: 3.2 million EUR

Activities:

- design and execution of rehabilitation and expansion works for 2.2 km of thermal transport network route;
- the modernization of 41 thermal modules, by installing new fully automated thermal modules;
- testing and commissioning (PIF).

Rehabilitation of pumping stations

Chișinău

Customer: MEPIU, Republic of Moldova
Beneficiary: Termoelectrica Chișinău
Year: 2016
Value: 3.2 million EUR

Activities:

- project management;
- construction works and associated services;
- mechanical, electrical and automation installations;
- commissioning of electrical equipment.

Performances:

- Pumps efficiency >85%;
- Motors efficiency >95%.

Reconstruction of the thermal interconnection network between CET 1 and CET 2 circuits

Chișinău

Beneficiary: Termoelectrica Chișinău
Year: 2017
Value 2.3 million EUR

Activities:

- construction and installation works;
- supply and installation of pre-insulated thermal pipes;
- excavations, road repairs;
- installation of valves, fittings, sulfonic type compensators;
- rehabilitation of thermal chimneys - constructions and thermomechanics;
- commissioning.

Water and wastewater projects

Innovative solutions for high quality services addressed to utility companies and private companies

Rehabilitation of chlorination station and arrangement of Izvarna capture enclosure; rehabilitation and extension of the supply pipe Izvarna - Craiova thread II section I

Craiova

Beneficiary: Compania de Apă Oltenia
Period: 2020–2023
Value: 29 million EUR

Activities:

- Technical Project, documentation, authorizations and approvals;
- thread II adduction pipe extension works and existing adduction pipe rehabilitation works;
- connecting thread II of the supply pipe to the existing capture chamber;
- special works: construction or rehabilitation of road crossings and river crossings;
- rehabilitation of existing manholes and / or construction of any manhole with necessary insulation, emptying and ventilation valves;
- monitoring system;
- rehabilitation of chlorination station and administrative building;
- testing, commissioning, staff training.

Key elements:

- adduction pipe extension works: 1.587 m;
- adduction pipe rehabilitation works: 18.858 m.

Rehabilitation of the Izvarna – Craiova adduction pipeline, Section VI, Thread II

Craiova

Client: Compania de Apă Oltenia

Period: 2020-2022

Value: 13.5 milioane EUR

Activities:

- PAFSIN pipe, 1200 mm diameter, installation works;
- civil works (concrete manholes, massive and concrete pipe embedding);
- special works on the pipeline route (underpasses, overpasses);
- project management;
- testing, commissioning and personnel training.

Key elements:

- rehabilitation of adduction pipe in length 4.132 meters (nominal pressure: Pn10 bar);
- rehabilitation of adduction pipe in length of 4/426 meters (nominal pressure: Pn12 bar).

Drinking water treatment plants – equipping with filters

Slatina, Olt

Beneficiary: S.C. Compania de Apă Olt S.A.
Period: 2021–2024
Value: 11 million EUR

Activities:

- rehabilitation and extension of Nicolae Bălcescu and Salcia treatment plants: endowment with high-performance equipment for treatment and monitoring of drinking water quality.

Key elements:

- maximum daily flow of 540 m3/h - Nicolae Bălcescu treatment and pumping station;
- maximum daily flow of 490 m3/h - Salcia treatment plant.

Rehabilitation of the main irrigation infrastructure

B.H. Călmățui, Brăila

Beneficiary: ANIF
Period: 2020–2024
Value: 10.6 million EUR

Activities:

- modernization of the irrigation infrastructure;
- construction works and hydromechanical installations;
- rehabilitation of electrical installations.

Key elements:

- flow rate pumping station SRPA 1+3: 59.400 m3/h;
- flow rate pumping station SRP 4: 44.280 m3/h.

Rehabilitation of irrigation facility

Viișoara, Teleorman

Beneficiary: ANIF
Period: 2018–2023
Value: 8.4 million EUR

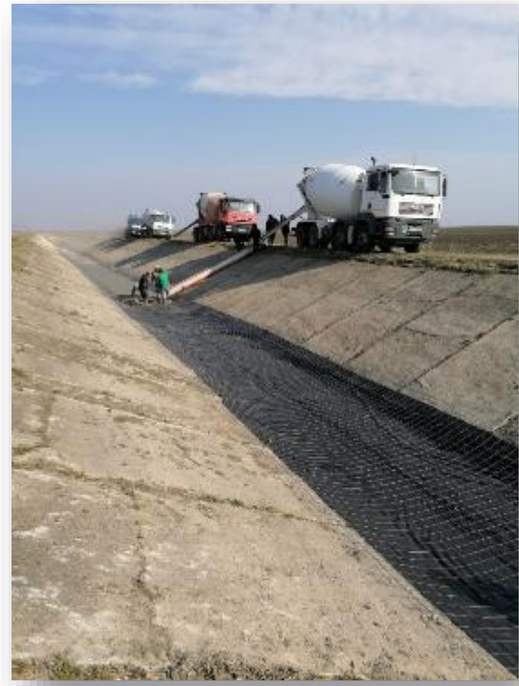
Activities:

- design services;
- construction works;
- hydromechanical works;
- electrical installations: medium voltage, low voltage, automation and supervision.

Key elements:

- Purchase and installation of pumping equipment:
  - SPA Gârla Iancului:
    - 4 pumping units with the following characteristics: Q = 5.33 mc/s, H = 4.5m;
    - 2 submersible pumps with the following characteristics: Q = 4l/s, H = 25m;
    - 2 submersible pumps with the following characteristics: Q = 15l/s, H = 15m;
  - SRP 2 Zimnicea:
    - 2 pumping units + 1 pump with the following characteristics: Q = 1.1 mc/s, H = 54m;
    - 2 submersible pumps with the following characteristics: Q = 3l/s, H = 25m;
    - 1 submersible pump with the following characteristics: Q = 15l/s, H = 15m.

Rehabilitation of the main irrigation infrastructure,
Nămoloasa Maxineni, Brăila



Beneficiary: ANIF
Period: 2019–2024
Value: 6.9 million EUR

Activities:
- modernization of the irrigation infrastructure;
- construction works and hydromechanical installations;
- rehabilitation of electrical and automation installations.

Key elements:
- flow rate pumping station SPA Nămoloasa: 14.832 m³/h;
- flow rate pumping station SRPA I: 13.680 m³/h.

Irrigation system implementation

Țigănași, Iași

Beneficiary : Agricola 96 S.A., Iași
Period: 2017–2019
Value: 4.1 million EUR

Activities:

- civil works at: pumping station buildings, water tank, pumping stations basins and ventilation booths;
- mechanical works: pipelines and pumping stations;
- low-voltage electrical works: panels, equipment circuits, lighting and automation;
- medium voltage electrical works: connections and transformation stations.

Irrigation system rehabilitation

Grădiștea-Făurei-Jirlău, Brăila

Beneficiary : ANIF
Duration: 2019-2023
Value: 4 million EUR

Activities:

- pumping stations (replacement of pumping units, suction and discharge pipes, hydromechanical installations and fittings, provision of priming and ventilation facilities);
- adduction channels (cleaning works, mechanized reprofiling, filling of broken tiles, rehabilitation of floors, replacement of valves);
- pipes / collectors (suction pipes, duct / discharge manifolds, priming plant, exhaust system, aeration-deaeration connection pipe defense dam).

Romcarton Project – Electrical Works

Popești-Leordeni, Ilfov

Beneficiary: Romcarton, Ilfov
Year: 2017
Value: 2.1 million EUR

Elsaco carried out:

- power supply;
- electricity distribution;
- interior and safety lighting;
- 230 / 400 V outlets, power receptors;
- protection against atmospheric discharge.

Water and sewerage network

Roșiori, Răchiți, Botoșani

Beneficiary: Răchiți Commune, Botoșani
Period: 2018–2020
Value: 1.7 million EUR

Activities:

- water network extension;
- execution of water connections, water branching, sewer network, sewer connections, manholes and connections;
- execution of wastewater pumping stations.

Water supply system

Curtești, Botoșani

Beneficiary: Curtești Commune, Botoșani
Period: 2019–2021
Value: 1.7 million EUR

Activities:

- design services;
- construction works and installations for the water supply;
- supply and installation of technological equipment and machinery;
- execution of water supply connections and valve manholes;
- construction works for water pumping stations and water storage tanks;
- testing and commissioning.

Rehabilitation of irrigation facility

Zimnicea, Teleorman

Beneficiary: ANIF

Period: 2018–2020

Value: 1.6 million EUR

Activities:

- procurement and installation of technological equipment, electrical equipment, facilities;
- electric power, lighting works in pumping stations;
- suction and discharge pipes embankment;
- priming equipment in pumping stations;
- -aspiration-discharge technology lines Qp. = 1200 mc / h, 2800 mc / h, 5900 mc / h.

Modernization and rehabilitation of SPA LUNCA pumping station

Iași

Beneficiary: Federația de Organizații ale Utilizatorilor de Apă pentru Irigații „Aqua Lunca Prut”, Iași
Period: 2018–2019
Value: 1.4 million EUR

Activities:

- modernization of the irrigation infrastructure;
- construction works and hydromechanical installations;
- rehabilitation of electrical installations and automation.

Key elements:

- cumulative flow rate pumping station 18.000 mc/h;
- 3 direct suction pipes from Prut, with a diameter of 1.200 mm and a length of 200 ml each;
- the pumping station provides the water needed for an irrigation ring which will serve an area of 12.000 hectares.

Automation and SCADA projects

Smart solutions for advanced technologies

Acquisition and installation of SCADA equipment

Harviz, Miercurea Ciuc

Customer: Harviz SA, Miercurea Ciuc
Period: 2014 – 2016
Value: 1.3 million EUR

Activities:

- supply and installation of the process instrumentation;
- design, execution and installation of the electrical cabinets of automation and control;
- parameterizing the automation systems;
- monitoring and central controlling of the local automation systems;
- implementation of the communication system;
- hardware and software equipment for the Regional Dispatching and 2 Local Dispatching Areas;
- commissioning, testing and maintenance of the entire Regional SCADA System.

Automation, electrical installations and SCADA system

Galați

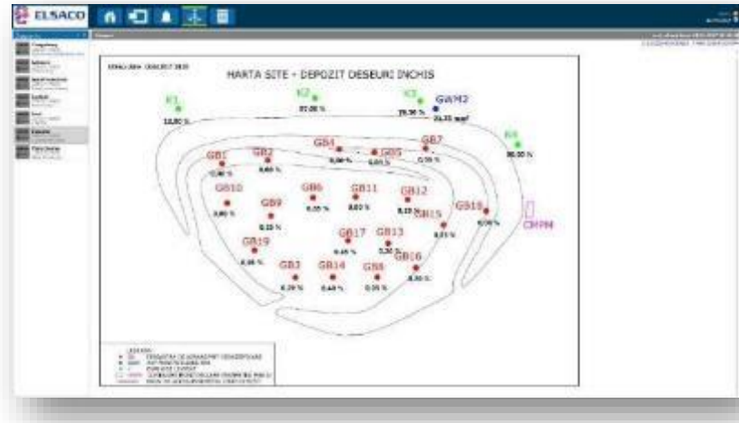
Beneficiary: Apă Canal S.A. Galați
Period: 2018-2023
Value: 0.7 million EUR

Activities:

- automation design and execution works;
- electrical installations;
- SCADA Regional Water System development / implementation;
- SCADA Regional Sewerage System development / implementation.

Online system for monitoring environmental parameters

Suceava



Beneficiary: Suceava County Council
Period: 2015-2016

Elsaco provided:

- purchase, delivery and commissioning of IT equipment;
- installation, configuration and commissioning of monitoring parameters software :
  WinDISP – local stations;
  EMMSYS – server.

Elsaco Solutions

Solar PV Plants

ELSACO SOLUTIONS designs, supplies, installs and finances the construction of photovoltaic power plants.

Solar PV plants for self-consumption for customers in trade and industry

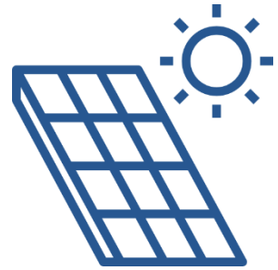
These solar PV plants are usually placed on the roofs of the beneficiaries' buildings, the power of the solar PV plant being correlated with the energy consumption.

Among the partners for which we've implemented such PV plants we mention KAUFLAND Romania, E.ON Romania, Continental Romania, Heraeus Romania.

Solar PV plants for energy delivery in the national network

They are usually made on the ground. ELSACO can also provide on request the services for the sale of energy produced by these PV plants, in accordance with the regulations of the energy market.

Prosumer solar PV plants

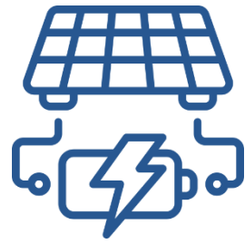


They are PV plants with a power of up to 1000 kW (according to current legislation) for which the excess energy is automatically taken over in the national grid.
ELSACO carries out the design and installation of these plants, being able to ensure, on request, the financing of these projects.

Solar PV plants for residential customers

They are low power plants (up to 30 kWp), usually made for residential customers.
These projects are funded by government programs (AFM) or the costs are borne by the beneficiaries.

Solar PV plants and energy storage

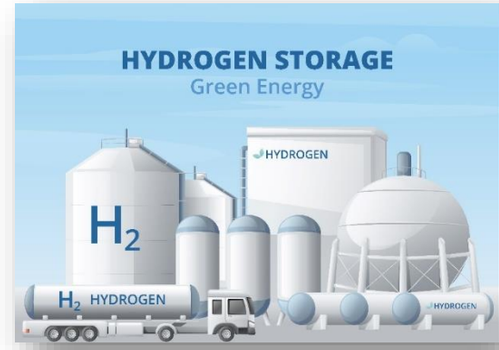


For all solar PV plant projects carried out by ELSACO, the PV plant solution and energy storage in batteries can also be offered.
The solar PV plant + energy storage, depending on the specifics of the project, ensures primarily:

- reduced costs (even up to 0) with the energy to be purchased;
- the continuity of electricity supply, even in the event of accidental interruptions from the energy supplier;
- optimal capitalization, maximizing the price obtained, for the energy produced by the solar PV plant.

For all solar PV plants developed by ELSACO SOLUTIONS, maintenance and monitoring services of the plant can be provided on request. Our customers have the guarantee of the good operation of the solar PV plant for a period of 25-30 years.

Energy storage solutions from ELSACO: Batteries, Hydrogen and Gravitational



International projects

Our professionalism and skills are worldwide recognized.

List of countries where Elsaco has implemented projects:

- Qatar
- Mauritius
- Poland
- Dubai
- Egypt
- Brazil
- Republic of Moldova
- Belgium
- Mali
- Morocco
- Zambia
- Australia

ELSACO®

Elsaco
41A Pacea Street
Botoșani, Romania

+4 0231 507 060 phone

+4 0231 532 905 fax

www.elsaco.com