



WORLDWIDE CONSULTANTS FOR OVER 50 YEARS



COMPANY PROFILE

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Dez Dam, Iran

ELC Electroconsult was established in 1955, with the objective of making available on the international scene the expertise accumulated over the years by three major Italian private firms leading and pioneering since 1905 in the planning, design and construction of hydropower schemes in the Alps mountain range of Northern Italy.

The company is based in Milan (Italy) and is fully privately owned.

ELC is not manufacturing or selling any equipment and has no connection whatsoever with manufacturers or suppliers of equipment. It is a world-wide consulting engineering company, registered with all major international lending agencies.

a bit of history...

The core activity of the company has always been the study, design, construction management of dams, hydraulic structures, hydroelectric and multipurpose projects dealing with irrigation & agricultural development.

In this field, ELC has provided technical and design assistance to several exceptional projects such as:

- Itaipu, on the Brazilian/Paraguayan border;
- Inguri, in the former USSR;
- Inga, on the Congo River;
- Dez, in Iran;
- Pancheswar, on the Indian/Nepalese border;
- Kurobe, in Japan;
- Majes, in Peru.

Since the time of its foundation, ELC has greatly diversified its range of activities.

ELC Electroconsult is historically specialized in hydropower and agricultural development studies and in the related implementation. In all these projects, the thorough assessment of the hydrological, hydro-geological and agricultural issues of the project constitutes an essential element for a successful outcome of the enterprise. At the same time, the conceptual scheme, choice of layout, selection of dam type and design of main project components are all key factors in order to select the best configuration for the project, optimizing the features of the project and overcoming difficult site conditions.

The company has an extensive experience of work in difficult and often seismically active terrains, such as the Andes of Peru and Ecuador, the Malacca Isthmus, Nepal and Mongolia.

fields of activities



Presidente Medici Power Plant, Brazil

Today, ELC is active in several other engineering sectors, such as thermoelectric and geothermal power generation, power transmission and distribution systems, urban and rural areas development, groundwater exploitation, land reclamation, project construction management, environment protection, social and institutional studies, project financing.

A summary of the fields presently covered by ELC services, in Italy and overseas, is shown in the following page.



Sibi-Quetta Railway, Pakistan

Power Generation

power system planning
hydroelectric power generation
thermoelectric power generation
geothermal power generation
non-conventional renewable energy sources
cogeneration and district heating
revamping and re-powering of generating plants
Supervision of plant operation & maintenance

Transmission and Distribution

HV and HHV transmission lines
MV and LV distribution systems
rural electrification
dispatching planning

Water Resources Development

multipurpose projects
dams and associated hydraulic structures
groundwater research and development
water supply for urban and rural areas

Irrigation and Agricultural Development

irrigation and drainage systems
integrated area development
sociological / socio-economic studies
soil & land survey
agricultural development and research
agricultural services
institutional development

fields of activities

Infrastructures

urban development planning
industrial complexes planning
transportation (roads, railway and harbors)
sewerage systems
water treatment plants

Project Construction Management

management of relation with design engineers and contractors
planning and control of timing and costs
quality control
works supervision and assistance

Environment

environmental survey and impact assessment
human settlement and resettlement planning
emission control and water treatment plants
management and monitoring plans

Public Sector Modernization /Private Sector Development

BOT & BOOT projects
strengthening of public institutions
financial analysis and due diligence
project financing

ELC Electroconsult longstanding world-wide experience has included the provision of the following services:

- Planning studies and preliminary design
- Prefeasibility and feasibility studies
- Environmental impact studies
- Final design, preparation of pre-qualification and bidding documents
- Project preparation for international lending agencies and credit sources, assistance in project financing
- Assistance to Clients in bidding processes, bid evaluations and negotiations with contractors and suppliers
- Detailed design
- Construction management and supervision

our services

- Factory inspections, quality control, procurement and expediting, project management services (planning, budgeting, scheduling and supervision)
- Supervision of power plants O&M
- Preparation of O&M manuals, training of operation personnel
- Project commissioning
- Consultancy services and assistance during the plant operation
- Technical assistance programs



Rio Prado Substation, Colombia

Institutional strengthening and training of Client's personnel has always been part of ELC activities, largely carried out in developing countries, both in close cooperation with the Client's personnel and in association with local consulting firms and organizations.

Occasionally, ELC also arranges integrated (technical & financial) packages for its Clients, thus combining the functions of a consulting firm with those of a company supporting customers in securing appropriate financial resources for their undertakings.



Guddu Power Plant, Pakistan

The organization of ELC Electroconsult is characterized by a very agile and flexible structure, that focuses on the provision of customized services to suit the specific needs of the Clients, both in terms of technical and “cultural” requirements.

The operational management of the Company includes the General Manager, the Technical Directors and the Business Development Director.

The technical personnel is divided in four **Departments**, broadly mirroring the basic fields of activity of the company:

- ◆ **Power Development.** In charge of projects relevant to the electric generation, transmission and distribution, rehabilitation of existing plants and of T&D systems, construction management.

... and our organization

- ◆ **Water Resources and Infrastructures.** In charge of projects relevant to the development of hydric and agricultural resources, implementation of irrigation and drainage schemes, implementation of urban and rural infrastructures, construction management.
- ◆ **Natural Sciences and Environment.** In charge of the execution of basic studies (topography, geology, geotechnics, hydrology) and of the environmental assessment for projects of any nature.
- ◆ **Power Sector Modernization & Private Sector Development.** In charge of the assistance to public institutions and utilities, private investors and lending agencies for projects of privatization, institutional strengthening and efficiency improvement.

These Departments are supported and complemented by a **Computer Center** and by a **Quality Control Unit**, which provide all the required basic information and software tools, together with the guarantee of an excellency standard of the final product.

For any new potential assignment, starting from the proposal preparation stage, a Project Manager is identified among the most senior personnel and the work team defined. The Project Manager is then fully responsible for the successful implementation of the task, with the assistance of the Technical Directors, who coordinate the work of the whole personnel, averting possible interference and conflicts among the different projects. Based on this approach, the four Departments do not constitute “watertight compartments”, but rather interact more or less intensely, as a function of the nature and scope of the individual projects.

Whereas about 10% of ELC total annual turnover is normally generated in Italy, the Company operates a well-organized network of overseas Representative Offices, supporting and promoting its overseas activities.

The organizational structure of the Company foresees a *Permanent Staff*, who are entrusted with the day-to-day management of the projects, liaison with the Clients and provision of standard professional services. In order to enhance its flexible approach and to easily adapt to the Client’s requirements, the staff are supported by a group of *Full-time Consultants*, mostly ex-employees of ELC, who assure, besides a highly qualified and international experience, a full appreciation of the Company working methodology.

The following table shows the number of ELC personnel:

Sector	Permanent Staff	Part-time Consultants	Total
Management	5		5
Power Development Department	13	11	24
Water Resources and Infrastructures Department	11	9	20
Natural Sciences and Environment Department	6	5	11
Public Sector Modernization and Private Sector Development Department	3	7	10
Computer Center / Quality Unit	5		5
Business Development	6		6
General Services	3		3
Total	52	32	84

ELC Electroconsult has been developing over the years a range of facilities designed to support its technical activities in Italy and overseas.

Among others, it is worth mentioning the Company's technical library including more than 50,000 volumes, technical reports and documents. The material in the library emphasizes such topics as power generation and geothermal energy, irrigation and agricultural development, electrical topics, hydraulic engineering, civil engineering.

ELC Electroconsult is also equipped with advanced CAD releases and sophisticated home made software. This valuable internal resource enables ELC Electroconsult to provide Clients with computerized design services, including bi-dimensional and three-dimensional (3D) modeling of industrial plants, power plants and any other infrastructures or civil works.



Chiew Larn Multipurpose Project,
Thailand

home office facilities
home office facilities

ELC is also provided with the most recent releases of dedicated and in house software, that allow our technicians to develop complete studies, both in terms of feasibility level calculations and of existing system behavior.

Investigations, Laboratory Tests, Geotechnical and Geomechanical Studies

Programming of site and laboratory geognostic investigations with relevant technical specifications. Supervision of site and laboratory investigations. Data analysis and interpretation. Geotechnical studies, including definition of geotechnical design parameters, appraisal of local and overall stability of excavations, embankments and foundation works. Design and technical specifications of monitoring systems, including processing and interpretation of measurements.

Physical Hydraulic Models

Definition of the hydraulic design features worth to be analyzed through physical models. Preparation of technical specifications and planning of tests. Assistance during tests, analysis and interpretation of results.

Seismic Risk Evaluation and Dynamic Analysis of Structures

Seismic risk analysis of the project area. Modelling and analysis of the local seismic response, evaluation of the dynamic parameters of the Maximum Credible Earthquake and of the Design Earthquake. Finite element mathematical models for the study of dynamic interaction between a structure and its foundation. Appraisal of liquefaction phenomena.

Physical Static and Dynamic Models, Geomechanical Models

Definition of the foundation characteristics and structural design features worth to be investigated by physical models. Preparation of technical specifications and planning of tests. Assistance during tests, analysis and interpretation of results.

special services

Mathematical Models

Finite element models (FEM) to calculate distribution of stresses in the structures, in the corresponding foundations and in the rock masses. Finite element models for the static and dynamic analysis of loose material dams and underground works, adopting different behavior laws for soils and rocks. Finite difference and finite element models for the analysis of filtration and consolidation problems. Models for the study of free and pressure flow water discharge and transients in hydraulic systems.

Automated Design

Development of three-dimensional interactive models simulating both the civil structures and the equipment of projects. Checking of interferences, automatic optimization of piping and cable layouts. Extraction of bi-dimensional drawings. Automatic extraction of bill of quantities. Possibility of generating neutral files for use by other office automation packages.

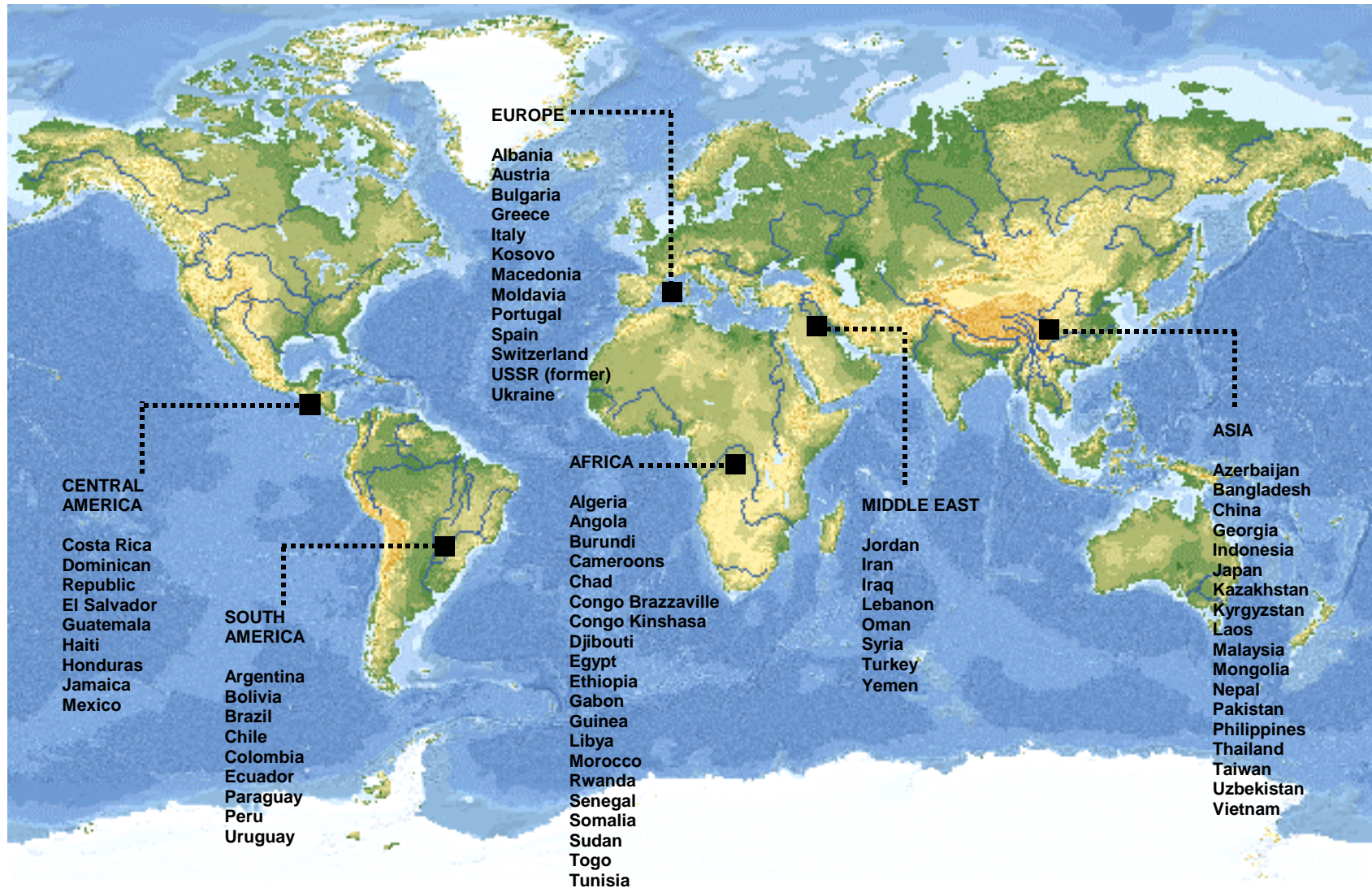
On the competitive scene of the international engineering consulting services, ELC Electroconsult has earned over the years a sound reputation for technical and financial reliability.

A milestone in the company's history is represented by the services provided over a period of about 25 years to the Governments of Brazil and Paraguay for the planning, design, construction supervision and operation of Itaipu hydropower scheme, that remains, with a total installed capacity of 12,600 MW (18 units of 700 MW each) one of the largest hydropower schemes in the world.

achievements achievements

The firm has developed close relationships with virtually all major international lending agencies, including the World Bank, Asian Development Bank, African Development Bank, Inter-American Development Bank, Commission of the European Community and an array of national development banks.

As of the end of 2001, ELC Electroconsult has undertaken over 1,650 assignments in Italy and overseas, and it is ready to face newer challenging ones.



ELC worldwide experience