



Energy and Environmental Technology – When Experience Matters



Innovation by experience



AF-Colenco Ltd – Who We Are



An international consulting and engineering company



AF-Colenco Ltd is a leading Swiss engineering company with an extensive service portfolio in all areas of energy and environmental technology. Whatever the size of the project, customers benefit from the in-depth know-how and broad experience of a team of highly qualified professionals operating around the world.

As a company of the global ÅF Group, AF-Colenco Ltd has access to a network of several thousand employees.

Optimal integral solutions

Our company operates through a global network in which interdisciplinary thinking and action play a key role. By uniting proven processes with innovative concepts, we create integral solutions of landmark importance in the technical and financial areas.

Our first priority is to provide first-rate engineering services in all fields of energy and environmental technology to secure our customers' market success. In so doing, we also strive to maintain and improve the quality of life while taking all possible measures to preserve and save natural resources. To achieve this goal, we make use of our company's know-how, our international market presence and the full range of potential of our staff. Colenco sees itself as an independent agent of our clients, without affiliations to the suppliers, providing services aligned at all times with the needs and standards of the customers.

Our customers benefit from:

- decades of technological and managerial experience, gained worldwide, in energy and environmental matters
- independent assessments and reviews
- highly qualified personnel
- multidisciplinary capabilities coupled with interdisciplinary working methods

Long-standing customer relations

Our customers are traditionally government offices, public authorities, power supply companies, independent power producers and further industries, including banking and development institutes. Colenco has had successful long-standing business relationships with customers in many of these sectors for decades.

Major foreign projects are often financed by international financial institutes such as the World Bank, the Asian Development Bank, the European Bank for Reconstruction and Development or the Inter-American Development Bank, with all of which Colenco is registered. Studies are also carried out for programmes of the United Nations and other international organizations.



You can rely on us!

Tradition, experience, worldwide presence – these three qualities characterize Colenco best: Founded over 100 years ago, our company can look back on a long, proud tradition. And we have the experience to match it – experience we put to good use in your projects. It stems from the hundreds of plants and installations we have worked on, involving every possible technology and working technique. We are present in our markets worldwide, with employees always ready to serve our customers wherever they are in the world.

As our customer, you are well looked after: You entrust us with your request or vision, and we work out, with you, the economically optimal solution. Then we supervise the completion of your project. Acting as your problem-solver and partner, we align our services with your precise needs. With Colenco, you know you are in good hands. You can rely on us – as many customers do with whom we have had long and successful business relations for decades.

**Roberto Gerosa,
Chairman of the Executive Board**

Hydropower Plants



Expertise and experience,
gained over
more than a century

With demand for clean energy growing, there is both a social and a political need to make increasing use of hydro-electric power. Colenco undertakes the planning and realization of hydro-power plant projects to secure a reliable electricity supply while also making every effort to preserve natural habitats. Our expertise is built on project experience gained in over 100 years in the business.

Our service portfolio

- Studies
- Site selection/environmental impact studies
- Conceptual studies
- Project design
- Project management
- Construction supervision
- Innovative integral solutions
- Financing
- Operation and maintenance

Areas of activity

- Hydropower plants
- Dams/reservoirs
- Geotechnics/foundations
- Electrical and mechanical equipment
- Hydraulic structures
- Hydrology and hydraulic structures
- Construction/statics



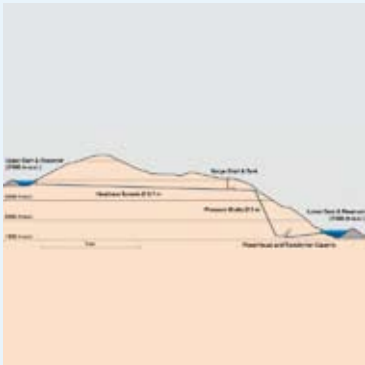
Yeywa hydropower plant, Myanmar

Description of project

The Yeywa project is designed to make use of the hydropower potential of the Myitnge river. Key features of this project are a dam, powerhouse with four 200-MW turbine-generator sets, the transformer station and a 230-kV switching station.

Our services

Site selection studies, conceptual design of the civil works and equipment, as well as assistance with the tender design, project planning, supervision of construction and commissioning.



Siah Bishe pumped storage scheme, Iran

Description of project

The 4x260-MW Siah Bishe pumped storage plant is being built to meet peak energy demand. Two dams are being constructed for the water storage. The powerhouse and transformers are located in caverns. This plant is the first of its kind in Iran, which gets most of its electricity from thermal power plants.

Our services

Consulting and, in collaboration with two Iranian partners, all engineering work for the conceptual design and construction of the plant.



Run-of-river power plants on the Drin river, Albania

Description of project

To ensure more reliable power production, the Fierza (500 MW), Vau i Dejes (250 MW), Shkopeti (25 MW) and Ulza (25 MW) power plants on the Drin river are being rehabilitated. The mechanical, electrical and control equipment as well as the safety systems for the plants, now 25 to 50 years old, are also being modernized.

Our services

For this project, Colenco undertakes the project management and conceptual design, assists with the tender design, and is responsible for contracting and for training the customer's personnel.



Ruppoldingen hydropower plant, Switzerland

Description of project

The plant, built in 1895 on a side canal of the Aare river, has been replaced by a new run-of-river power plant. The new concept allows energy production to be almost tripled. Extensive ecological measures improve the natural environment in the immediate vicinity of the plant.

Our services

As general planner, Colenco was responsible for ensuring an optimal, environmentally compatible realization of the project, comprising construction of the new plant, issues involving the higher water level and dismantling of the former plant.

Thermal Energy Plants



All engineering services
from one source

Colenco's engineers can provide the full range of services our customers require, from project development through detailed design to commissioning. And for every possible size and type of plant, whether coal-fired power plants, combined cycle power plants, cogeneration power plants or waste incineration plants. The many projects in our reference list range from small 100-kW power-generating plants to major power plant stations rated to 1,400 MW.

Our service portfolio

- Project identification and development support
- Project management
- Expertises, project appraisal and consulting
- Energy and environmental impact studies
- Feasibility studies and process evaluations
- Conceptual and detailed project planning
- Tender documents
- Bid evaluation and contract documents
- Supervision of project work, commissioning and acceptance measurements
- Training and plant documentation

Areas of activity

- Coal-, oil- and gas-fired power plants
- Combined cycle power plants
- Biomass cogeneration plants
- Thermal waste treatment plants
- Flue gas cleaning systems
- Plant rehabilitation and optimization
- Electrical and control systems



Na Duong fluidized bed power plant, Vietnam

Description of project

Vinacoal built a power plant to produce electrical energy from waste coal (high ash and sulphur content) at Na Duong in the north of Vietnam. The power plant with an electrical capacity of 110 MW is based on the circulating fluidized bed (CFB) technology.

Our services

As owner's engineer, responsible for overall project management, planning, tendering, engineering and site supervision.



Novel combined cycle power plant Milan, Italy

Description of project

The new, gas-fired combined cycle facility of Novel in Novara for the production of power and process steam commenced operation in 2004. The generation capacity of the plant is 100 MW_e and 80 MW_{th} (100 t/h steam). The process steam is supplied to a neighbouring chemical plant.

Our services

All owner's engineering services, from project development, conceptual design, tender documents, bid evaluation, design review, site supervision up to plant commissioning services.



Phu My 2 (Add-on), Vietnam

Description of project

The Phu My 2 gas turbine power plant of Electricity of Vietnam, located in the south of the country, was converted into a combined cycle power plant by retrofitting it with two heat recovery steam generators and one steam turbine. This increased the electrical output of the plant from 300 to 450 MW. In 2004, the plant started its commercial operation.

Our services

Colenco supplied all owner's engineering services for planning, project management, tender preparation and evaluation, site supervision, commissioning and training.



Pforzheim biomass cogeneration plant, Germany

Description of project

The Pforzheim cogeneration plant supplies the city with electricity and heat via a district heating system. The biomass plant (commissioning 2005) with a capacity of 13.3 MW_e and 25 MW_{th}, fired with waste wood, reduces the fossil energy (coal, gas) consumption and, consequently, the amount of CO₂ emissions.

Our services

Colenco was responsible for the overall project management and planning, approval planning, tender documents, bid evaluation, assistance with drafting contracts, as well as supervision of construction and commissioning.

Nuclear Technology



Optimal solutions for maximum customer benefit

Colenco has been active in the nuclear technology sector since the 1950s, and has played an important role in the planning, design and construction of nuclear power plants in Switzerland and other European countries. Meanwhile, the company has provided consulting and engineering services for more than 100 customers in 35 countries, involving all types and sizes of nuclear facilities. The goal has always been the same: optimal solutions providing maximum benefit for the customer.

Our service portfolio

- Construction and retrofitting of nuclear installations
- Operation of nuclear facilities
- Plant life extension
- Waste management
- Decommissioning and backfilling of nuclear facilities

Areas of activity

- Feasibility studies and design reviews
- Support with procurement and project management
- Control system upgrades: qualification and documentation
- Operational safety analyses
- Investment analyses
- Environmental analyses
- Retrofit concepts
- Maintenance planning
- Emergency/precautionary measures
- Training
- Waste disposal and decommissioning concepts



ZWILAG Würenlingen, Switzerland

Description of project

ZWILAG Central Interim Storage Facility for radioactive waste from the medical, industrial and research sectors. Using the latest technologies, the waste is converted before intermediate storage into a form ready for final disposal.

Our services

As part of a joint venture, Colenco planned the conditioning plant for weak radioactive waste, mechanical and electrical installations, control systems as well as the IT system for the overall facility.



Transport of radioactive waste, Switzerland

Description of project

Transport of six large steel containers with radioactive waste from the decommissioned nuclear power reactor site in Lucens to the ZWILAG Central Interim Storage Facility in Würenlingen.

Our services

Verification that each individual container can be safely loaded onto the heavy-duty trailer and securely positioned during transportation in every traffic situation. Also, the specification of the method used to secure the containers and supervision of the loading.



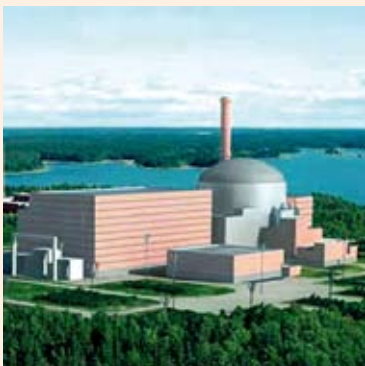
Würgassen nuclear power plant, Germany

Description of project

Decommissioning of the Würgassen nuclear power plant is currently underway with the dismantling of the control systems and equipment. The decision to decommission the plant was taken in 1995 following the identification of cracks in the reactor core shroud, and work should be completed in 2010.

Our services

Preparation and drawing up of documentation for approval of the decommissioning activities, i. e. modification of regulations for the remaining lifetime (operating, test and maintenance manuals, quality management, documentation manual and decommissioning concept).



Olkiluoto 3 nuclear power plant, Finland

Description of project

Olkiluoto 3 is the fifth nuclear power unit to be built in Finland. With an output of 1,600 MW, it is the largest nuclear power facility worldwide.

Our services

Colenco prepared the tender documents and participated in the contract negotiations for this new project (including the fuel for Olkiluoto 3).

AF-Colenco Ltd – the Company



Our highly qualified experts and all-rounders operate globally as one team

Services provided by Colenco have contributed to the success of over 1,500 projects around the world. This performance record was made possible by our employees – highly qualified engineers, scientists and technicians, as well as financial and contract specialists. Thanks are also due to our international and local partners, with whom we have worked together successfully for years, and whose knowledge and experience our customers can rely on.

Our consulting, planning and implementation services are provided through the comprehensive expertise and broad experience of our employees, aided by the very latest support tools and methods.

For every new contract, we bring specialists from different groups and units together in a project team that reports to the executive board.

To continuously grow our knowledge base, our employees regularly attend courses on the newest technologies and developments. We also cooperate closely with universities of applied science and colleges, and we are in regular contact with national and international research institutes and laboratories.

In a number of areas we have also worked closely for several years with international and local partners whose knowledge and experience provide key support for us and our customers.

Whether the energy or environmental project is sited in mountainous terrain, frozen wastes, an Asian or African jungle, or an urban area, our experts and all-rounders always work together as only a well-established team can do.



Electrical Networks



A force in power transmission

As a specialist in electrical network construction, we have been responsible for numerous projects – substations as well as HV power lines – in the power transmission and distribution sector, at voltage levels of 11 to 500 kV. Our vast experience in overhead line construction has enabled us to successfully complete ambitious projects in difficult terrain, such as in snow and ice at 2,400 m a.s.l. in the Swiss Alps, in the Asian and African jungle, and on marshy sites alongside rivers and lakes.

Our service portfolio

- Profitability evaluations
- Studies and expertises
- Project management
- Detailed design and planning
- Tender preparation, evaluations and contract negotiations
- Work planning, quality assurance, construction supervision
- Extension and maintenance planning
- Instruction, training
- Environmental evaluations
- Calculation of electromagnetic fields

Areas of activity

- Development of network projects
- Substations
- Transformer stations
- Overhead HV lines
- Towers and foundations
- Mobile communication systems



Transmission line Switzerland–Italy, Bernina line

Description of project

A more than 1,000-MW increase in capacity for the power interchange between Switzerland and Italy via a double-circuit 400-kV overhead line. Extension of the local network by an additional 150-kV and 60-kV power circuit. Installation of 148 latticed steel towers, involving 5,200 tonnes of steel and 7,400 m² of concrete, mostly transported by helicopter.

Our services

Determination of right-of-way and approval procedure, environmental evaluation, detailed design, including tower statics and workshop drawings, tender design, awarding of contracts and contract negotiations, project management and cost control, site management and commissioning.



Wasgenring substation Basle, Switzerland

Description of project

Rehabilitation of the entire underground substation, including ventilation systems and auxiliaries. Replacement of outdated air-insulated 150/150-kV switchgear by a compact SF6 GIS installation. Use of metal-enclosed 11-kV medium-voltage switchgear and state-of-the-art control and protection systems. Overall management and coordination of all planning (construction, heating, ventilation, plumbing).

Our services

Concept for rehabilitation, overall planning, detailed design, tender preparation and negotiation and awarding of contracts, project management with cost control, commissioning.



Network upgrade in Nigeria

Description of project

Improvement of the power supply for the capital through construction of a 145 km long, 330-kV overhead power line from Shiroro to Abuja and two new substations (330/132/33 kV), plus the laying of an HV cable in the city.

Our services

Review and approval of the work plans of the suppliers and main contractor. Project management with cost control, quality assurance, acceptance tests, management of construction work, including commissioning of all network components.



Rehabilitation of transmission network in Albania

Description of project

Renewal and extension of the country-wide 400/220/110-kV network in Albania. Technical, commercial and financial analysis of the World Bank's investment programme.

Our services

Data recording and conditioning, definition of the project scope and priorities, investment planning and scheduling. Determination of the project's benefits in terms of system stability, availability and financial aspects. Preparation of a financial plan.

Water and Environment



We strive to preserve natural habitats

Natural hazards and environmental problems are likely to remain one of society's central problems in the medium to long term. At the same time, there is strong demand for public safety to be improved. Our services related to hydraulic structures, to the environment and to safety are aimed at preserving natural habitats. Besides committing our full know-how in this area of expertise to such projects, we also offer integral solutions, all from one single source.

Our service portfolio

- Studies
- Concept development
- Project engineering
- Supervision of construction
- Project management
- Consulting
- Integral solutions
- Operation and maintenance
- Know-how transfer and training

Areas of activity

- Hydrology and hydraulics
- Flood protection
- River engineering/renaturalization
- Natural hazards
- Environmental impact studies
- Risk analyses
- Noise mitigation
- Hazardous waste/soil conservation
- Urban and regional planning
- Institutional strengthening
- Water resources development



Environmental sanitation project Ho Chi Minh City, Vietnam

Description of project

Ho Chi Minh City, with a population of over 6 million Vietnam's largest city, needs new wastewater as well as drainage systems in order to achieve improvement goals in the areas of infrastructure, environment and public health. To do this, the urban wastewater organization has to be modernized and strengthened.

Our services

Consulting and institutional strengthening for the urban wastewater organization in the form of build-up of capacity, business planning, new information systems, personnel training and public relations programmes.



Water supply project Karakol, Kyrgyzstan

Description of project

Only 65% of the residents of Karakol are connected to the city's water supply, which is also unreliable and unsafe. Large sections of the supply system need modernizing, not least for health reasons. The goal is to connect the entire city to a safe, reliable water supply by 2010.

Our services

Colenco is preparing, on behalf of the Swiss government, a feasibility study to determine ways to modernize and extend the water supply in the city of Karakol.



Flood protection and renaturization, Switzerland

Description of project

Rivers and lakes in residential areas can periodically flood. When carrying out correction projects, it is important to satisfy the requirement for flood protection while also meeting the need to preserve, protect and upgrade the countryside and landscape.

Our services

Colenco prepares feasibility studies, flood protection and renaturization concepts, and designs all necessary measures.



Environmental compatibility reports, Switzerland

Description of project

When planning installations expected to have a major impact on the environment, it is important to analyze the relevant environmental areas and to integrate measures in the project that will bring improvements.

Our services

Colenco undertakes the management of projects aimed at determining environmental impact and undertakes the interdisciplinary coordination of the relevant specialist areas.

Groundwater Protection and Waste Disposal



Modelling and visualization of flow and transport processes

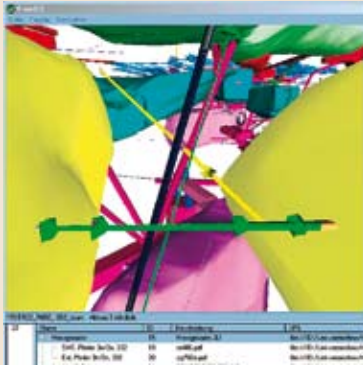
Groundwater is a resource in need of protection, a hazard factor for underground installations, or a transport medium for pollutants. Whatever the case, we study its flow paths and effects and simulate them numerically. Analyzing and interpreting the results requires effort, experience and flair. We take special pride in the comprehensive and attractive presentation of the results in words, as visuals and by animation.

Our service portfolio

- Hydraulic borehole investigations
- Hydrogeological characterization of underground systems
- Safety, risk and hazard assessments
- Software engineering and geomatics

Areas of activity

- Groundwater management
- Mine water predictions (water chemistry, flooding, exfiltration)
- Safety assessments for repositories
- Characterization of underground gas storage and hydrocarbon reservoirs
- Use of aquifers for heating and cooling purposes
- Geotechnical siting
- Probability assessment of natural hazards



Morsleben radioactive waste repository (ERAM), Germany

Description of project

The Federal Office for Radiation Protection (BfS) operates a repository for radioactive waste in Morsleben which it intends to close down in the foreseeable future.

Our services

Safety assessment for the repository: development of a model for the closure concept of extensive backfilling of the former salt mine, numerical simulation of the physical and chemical processes, visualization of the underground structures with interactive information scanning, support with licensing process.



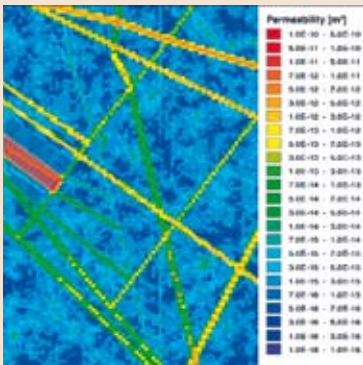
Hydrogeological field investigations Bure, France

Description of project

Clay is considered by the French National Radioactive Waste Management Agency (Andra) to be a potential host rock. To investigate the flow processes, hydraulic tests are carried out in boreholes at Bure in the rock laboratory and at surface.

Our services

The full service portfolio: support with the planning of the test programme, presence during the tests in Bure, analysis of the recorded data using a borehole simulator programmed by Colenco, assistance with the synthesis of the results, presentation to the authorities.



Hydrogeological modelling with density effects, Sweden

Description of project

Studies by the Swedish Nuclear Fuel and Waste Management Company (SKB) are focused on three generic sites with crystalline host rock. Formation water with a high saline content plays an important role in the hydrogeological conditions in Beberg.

Our services

3D modelling of the groundwater flow and saline transport using a stochastic approach to take account of fractures in the host rock, evaluation of the effect of an underground repository on the local flow system in the operational and post-closure phases.



Groundwater model Reusstal, Switzerland

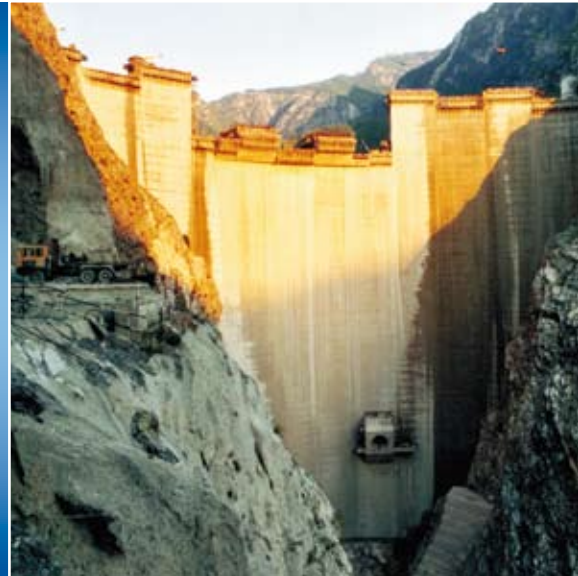
Description of project

Protection of the groundwater in the Reuss Valley – the source of fresh water for some 200,000 people – has a high priority. Use of a groundwater flow model allows the consequences of intervention in the complex water balance to be simulated for the canton of Lucerne.

Our services

Representation of the local hydrological conditions in a quasi-3D model for an approximately 15 km long section of the Reuss river, calibration of the model and simulation of scenarios.

A Global Market Presence



AF-Colenco Ltd
Active on all five continents

Our company is active all over the world. For decades, clients on all five continents have been able to rely on our sense of responsibility, our proven working techniques and our independent judgement. Projects have been successfully completed in over 50 countries around the world.



Innovation by experience



The ÅF Group is a leader in technical consulting, with expertise founded on more than a century of experience. We offer highly qualified services and solutions for industrial processes, infrastructure projects and the development of products and IT systems. We are also one of the leading

names in certified third-party testing and inspection work.

Today the ÅF Group has several thousand employees. Our base is in Europe, but our business and our clients are found all over the world.



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