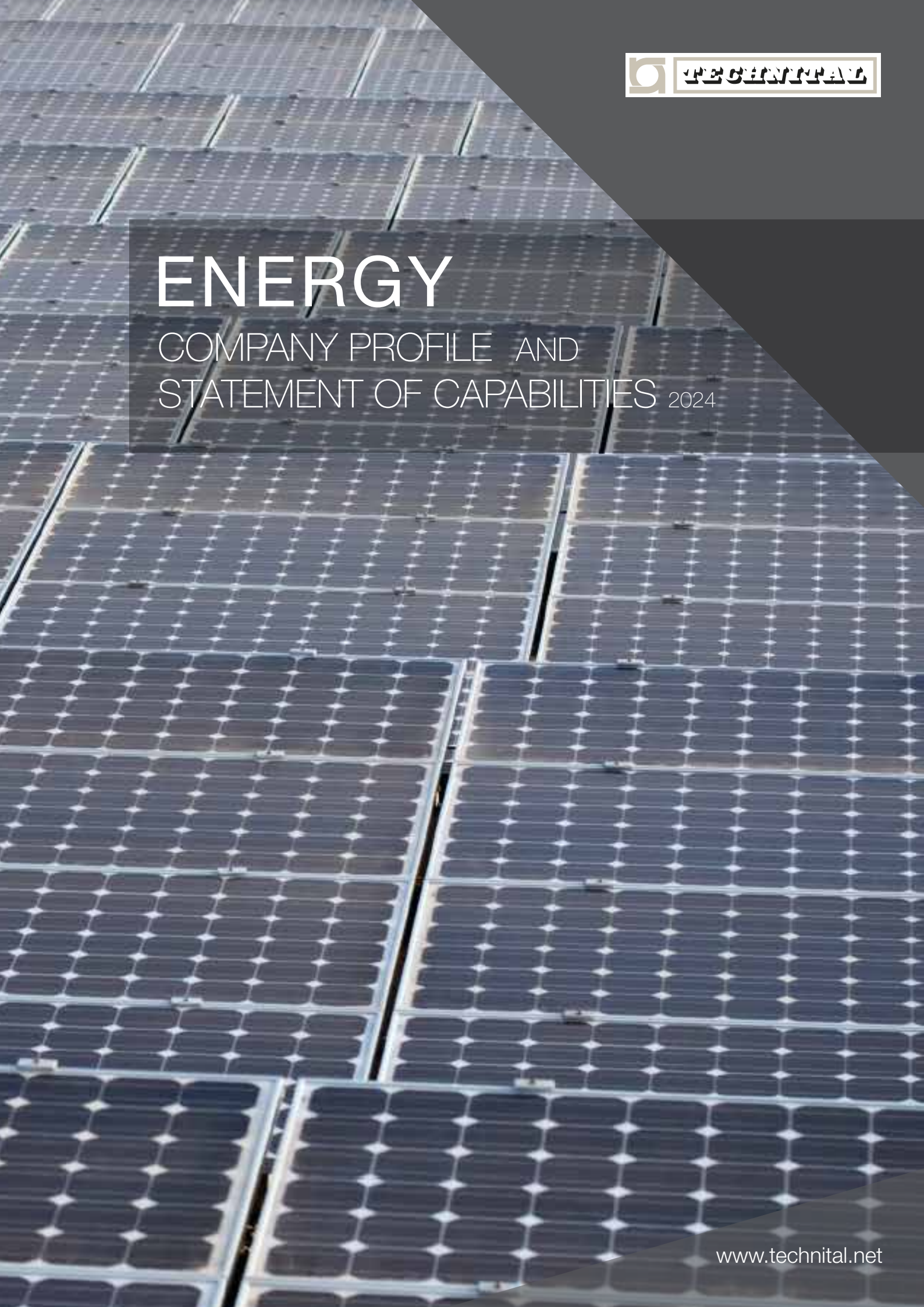


TECHNITAL

ENERGY

COMPANY PROFILE AND STATEMENT OF CAPABILITIES 2024

www.technital.net

CONTENTS

1 Company Profile

About TECHNITAL

Description

TECHNITAL is a private joint stock company established more than 50 years ago (in 1964) and is one of the oldest engineering consultancy companies in Italy. Thanks to its high level of expertise, its dynamic nature and versatility, management autonomy and efficiency and its sophisticated hardware equipment and software libraries, the Company has been awarded large scale international and national projects by major public and private entities and by international funding organizations.

TECHNITAL's headquarters are situated in Verona, Italy. The organization abroad includes 15 between branches and subsidiaries in Algeria, Armenia, Benin, Bosnia & Herzegovina, Croatia,, Georgia, Iraq, Kenya, Kosovo, Qatar, Tanzania, Trinidad & Tobago, Tunisia, Uruguay and Zambia and a number of local offices which is continuously changing according to the on-going international projects (at the moment there are 4 local site offices).

Services

TECHNITAL is a dynamic company working in the fields of transport infrastructure (roads and motorways, railways, inland waterways, urban transport, ports and airports), hydraulics (water treatment and desalination plants, dams, aqueducts, sewerage systems, waste water treatment), marine and coastal engineering, environment, energy (incineration and waste-to-energy plants, hydroelectric plants, solar plants, biogas plants), waste treatment (recycling plants, dump sites), buildings, architecture and urban planning.

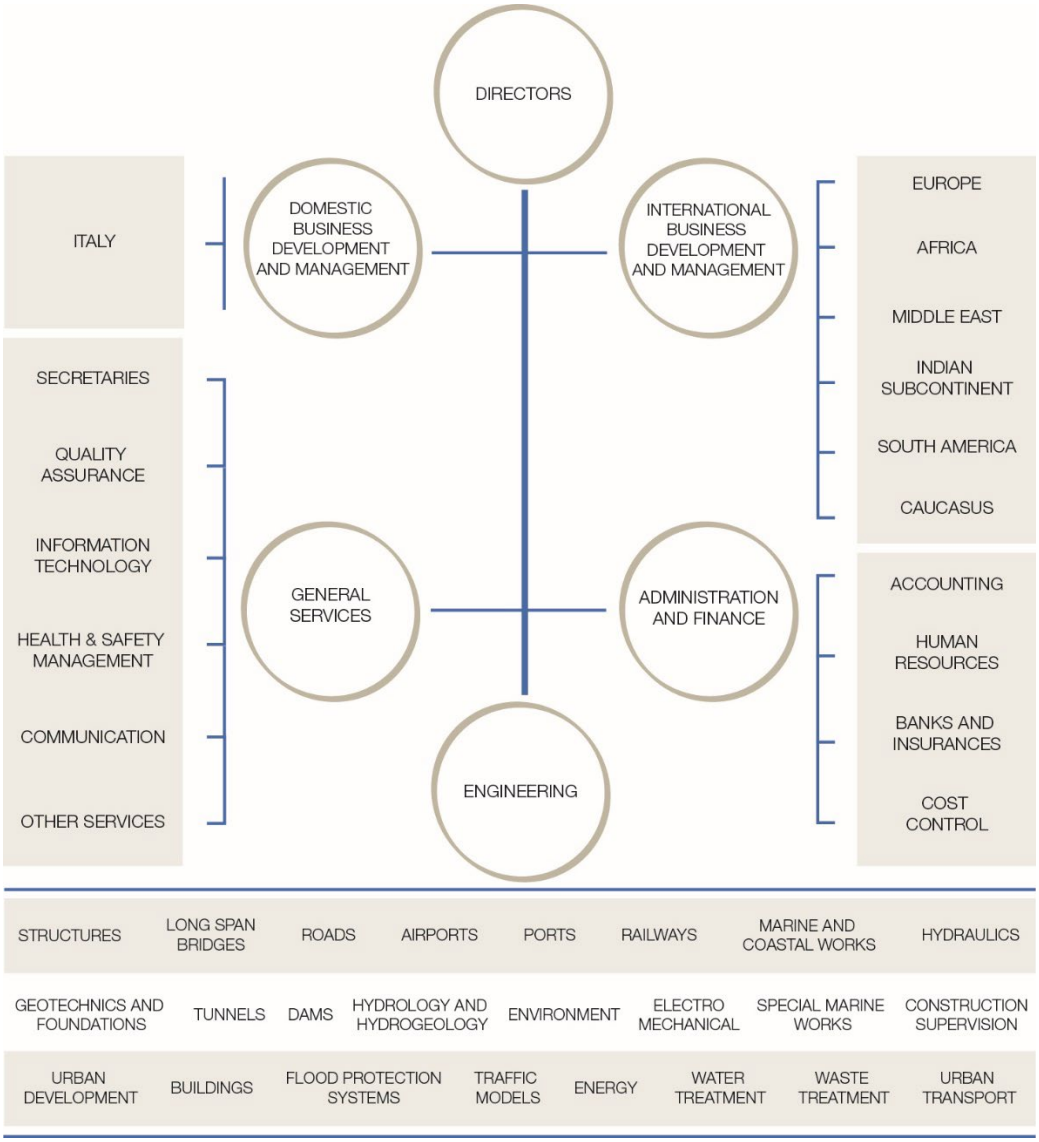
The company covers the full range of services, from planning and feasibility studies through to detailed design, works supervision and technical assistance:

- project management
- planning and economic-financial evaluation of investments
- feasibility studies and technical-economic evaluations
- all levels of design
- environmental impact assessment and studies
- traffic studies
- procurement and assistance with tenders
- construction supervision, quality assurance, testing and commissioning
- co-ordination and supervision of research and laboratory tests
- development of hydrodynamic and hydrogeological analysis and simulations
- development and application of analysis methods and computer modelling.

TECHNITAL has worked in several countries world-wide: Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Bahamas, Benin, Bolivia, Bosnia & Herzegovina, Brazil, Bulgaria, Burkina Faso, Burundi, Cayman Islands, Colombia, Croatia, Cuba, Cyprus, Czech Republic, Democratic Republic of the Congo, Denmark, Djibouti, Dominican Republic, Egypt, Ethiopia, Georgia, Germany, Ghana, Greece, Guatemala, Hungary, India, Iraq, Italy, Jordan, Kenya, Kosovo, Libya, Madagascar, Malawi, Malaysia, Mali, Mauritania, Monaco, Montenegro, Mozambique, Nicaragua, Niger, Norway, Panama, Peru, Poland, Qatar, Republic of Haiti, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Slovenia, Somalia, Spain, Sudan, Syria, Tanzania, Togo, Trinidad & Tobago, Turkey, Uganda, Ukraine, U.A.E., United Kingdom, U.S.A., Uruguay, Venezuela, Yemen, Zambia.

Organization and staffing

TECHNITAL's multidisciplinary staff is organized according to the following chart:



TECHNITAL's multidisciplinary staff includes about 250 professional employees covering the various aspects of the engineering services: Transport, Hydraulics, Geotechnical, Marine & Coastal, Environmental Studies & Territorial Analysis, Structures, Electronic Data Processing & Systems Analysis, Quantity Surveying & Cost Estimation, Electromechanics, BIM/CAD/CAE, Works Supervision, etc.

The above staff is integrated by consultants and specialists, both Italian and foreign. Seeking support and advice from colleagues, scientists, and academics all over the world is part of TECHNITAL's policy of excellence.

Given the firm's considerable international experience, TECHNITAL's staff is proficient in the use of international engineering standards (BS, ASTM, AASHTO, ASME, API and the like) and contract conditions (FIDIC and others).

Quality control

TECHNITAL's activity is ISO 9001:2015 Quality System Management certified. The company is also certified ISO 14001: 2015 Environmental Quality Management, ISO 45001:2018 Occupational Health and Safety Management System and SA 8000:2014 Social Accountability Management System.

TECHNITAL has developed a company policy regarding quality control which is constantly being updated and applied, taking into account the costs to be sustained to achieve the objectives of quality and maximum benefit for both the Company and the Client. Thanks to its Quality Control System, TECHNITAL is capable of guaranteeing the quality of its services and of ensuring the Client that these services satisfy the required quality standards.

Code of Ethics

Ethical and responsible decision making is very important for the company in terms of risk management and in order to keep actions within the ethical and legal boundaries.

For that reason, the company is adopting a Code of Ethics (available from the web site of the company) and conduct for its Executives and Directors and for all the Employees able to fulfil requirements for responsible decision taking. Such code aims at reducing the possibility of stepping outside behavioral limits set by the company.

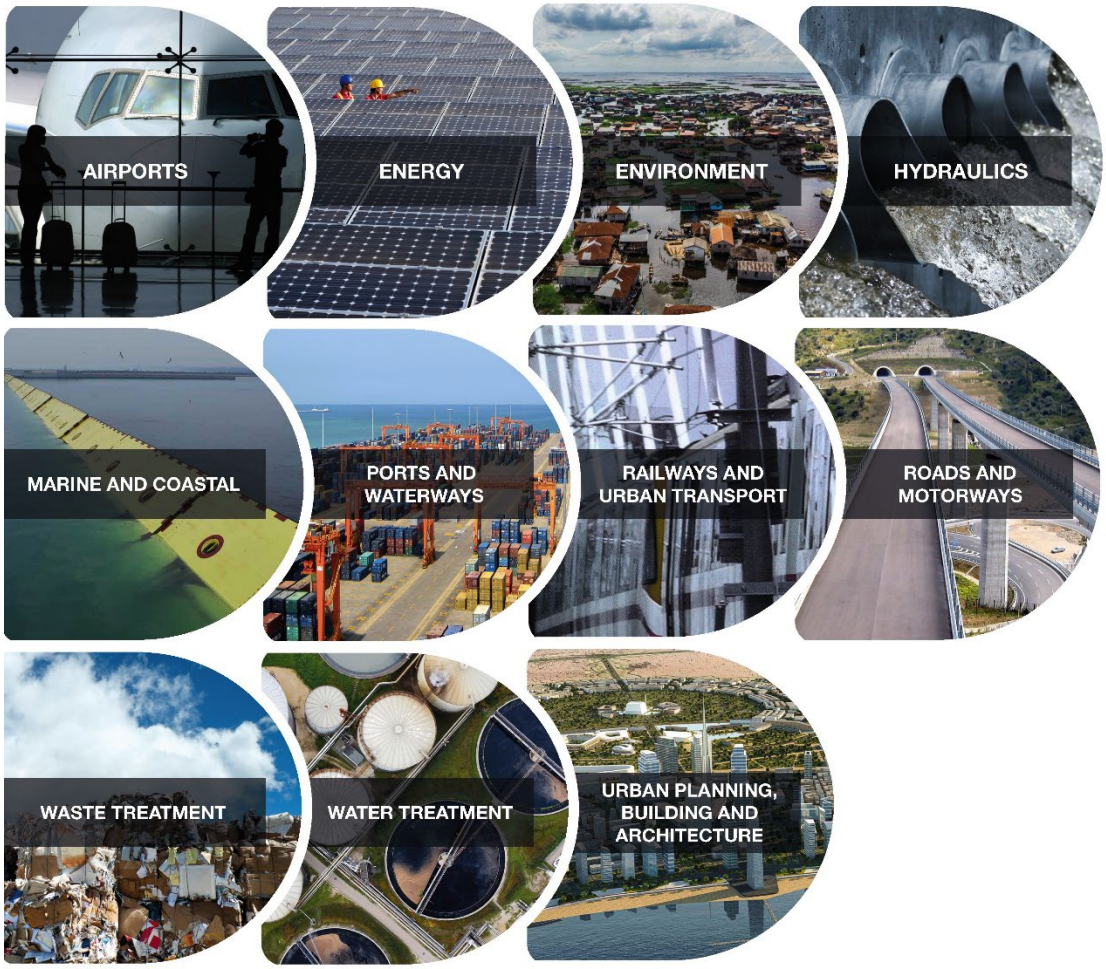
The Code of Ethics the company is adopting also meets the Organization, Management and Control Model pursuant to Italian Legislative Decree n. 231/2001.

Sector of Specialization

TECHNITAL provides high-quality consultancy services in different areas of specialization: Roads and Motorways, Railways and Urban Transport, Airports, Ports and Waterways, Marine and Coastal Engineering, Environmental Engineering, Urban Planning, Buildings and Architecture, Hydraulic Engineering, Water Treatment, Waste Treatment, Energy.

In each of these sectors, TECHNITAL provides innovative project solutions to Government Agencies, International Financial Institutions and Private Sector Organizations.

Services provided by TECHNITAL include master plans, feasibility studies, techno-economical evaluations, traffic studies, mathematical and physical modeling, all phases of design from concept to detailed design, environmental impact studies and monitoring plans, tender document preparation and assistance in the procurement of works, construction supervision.



2 Our Experience

Experience in Energy

TECHNITAL's activities in the field of energy engineering cover a broad range of technologies and systems with special emphasis to waste to energy plants, hydroelectric power plants, solar plants, biogas plants, power stations and electricity distribution grid.

In this sector, TECHNITAL, counting on its consistent multidisciplinary operative structure and its technical and electronic equipment, has successfully undertaken and completed some important and challenging projects, both in Italy and abroad, particularly where the identification of the best technical-technological solution required the use of experienced experts from different complementary disciplines.

The group of highly specialized engineers can in fact be supported by experts and senior engineers with specific know-how in the following fields:

- hydrology;
- geology and hydrogeology;
- geotechnics;
- structures;
- topographical surveying and mapping;
- mathematical modeling;
- computerized graphic simulations;
- electro-mechanical;
- process engineering;
- ecology;
- agriculture and soil science;
- quantity computation and cost estimates.

The services provided in this field include, among others: hydrological studies; geological and geotechnical studies; field measurements and monitoring; process engineering and process optimization; optimization of resources; structural design; electro-mechanical design; feasibility studies and cost/benefit analysis; environmental impact assessment; cost estimates; technical specifications and Tender Documents; construction supervision and management.

The Energy sector is becoming of fundamental importance globe-wide as the demand of energy is facing an exceptional rise because of population growth, urbanization, industrial needs of emerging economies. On the other side the energy sector as a whole is undergoing a major transformation because of the environmental challenges, the resources constraints and the technological advancement.

The consultancy activities related to this sector aims at the energy transition for green under the ambition to build a better society less and less relying on fossil fuels and nuclear plants and under the growing awareness that world can't count on unlimited access to energy and climate change is the real driver of man's future actions.

It is out of question that this sector is very dynamic as it evolves according to the continuous change of globe conditions. This fact also compels the engineers to a dynamic approach aiming at minimizing project footprints by applying modern and better practices and more balanced approaches.

In the specific field of the waste to energy plants, the Company has experience related both to the design/works supervision of new plants and to the upgrade of existing ones. In effects, it is known that the waste to energy technology is quickly developing and upgrading for the reasons mentioned before and, as a consequence, the features of the plants have to be upgraded too.

Here below are some pictures of the implemented plants.

Silla 2 is a waste to energy plant located in the north-west of Milan and it was designed and built for thermal waste incineration and co-generation of power and heat for district heating.

At its full capacity the plant can generate sufficient amount of heat to meet the requirements of 15,000 families living in the nearby districts. Also, the plant generates sufficient power to meet annual power requirements of 80.000 families. The flow capacity is of 60 tons/hour while the power capacity is of about 60 MW.

The most reliable and innovative technologies were implemented to assure the lowest environmental impact concerning emissions to the atmosphere, noise level, liquid and solid waste, and associated vehicle traffic. Special attention was paid to the implementation of control systems aimed at keeping the low impact values achieved unchanged.

Silla 2 (Milan) waste to energy plant

Here below the Leghorn waste to energy plant is pictured. Similar to the previous plant, in this case the energy recovery is made through steam powered turbo-alternator which leads, this time, to a power capacity of 11 MW. The flow capacity is of 230 tons/day.

Leghorn waste to energy plant

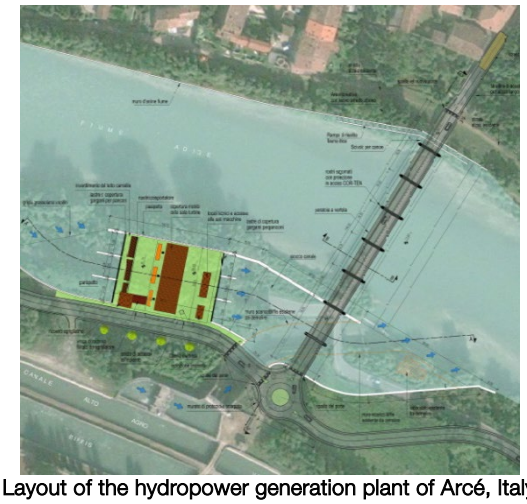
Here below is a picture of the Busto Arsizio waste to energy plant with a flow capacity of 21 tons/hour and power generation of almost 10 MW.

Busto Arsizio waste to energy plant

The waste to energy plant of Lecce has been designed for a flow capacity of 13 tons/hour and a power generation of 9 MW.

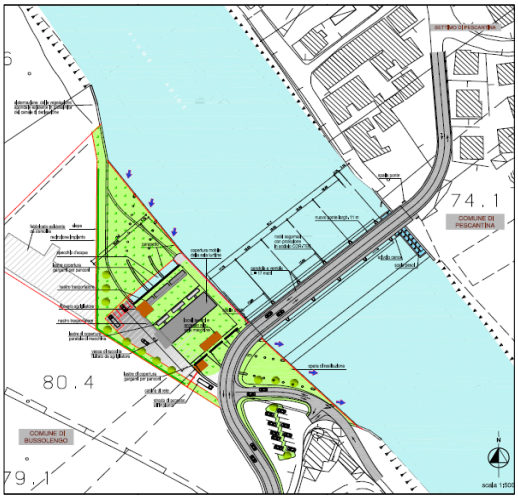
Lecce waste to energy plant

The company has also undertaken a number of projects in the field of hydropower generation both in Italy and abroad.
The below project is for the hydropower plant in Arcé along the Adige river in Veneto, Italy. The company was in charge of the detailed design and of the works supervision of a completely underground plant. The Plant generates 3 MW taking advantage of the river stream and of the elevation difference. The structure of weird is also used for bearing a bridge between the rivers.



Layout of the hydropower generation plant of Arcé, Italy

A very similar project was implemented in Settimo always on the Adige river. Also in this case the company was in charge of the detailed design and of the works supervision. Similar is the power produced and the underground structure and the road bridge over the weird.



Settimo hydropower plant, Italy

The project below is for the new hydroelectric plant of Pont Ventoux, in Val Susa, which foresees the partial use of Dora Riparia river waters. It is a plant for a generation of 388 GW and includes intake/offtake, reservoir (560.000 m3), pressure tunnel (2,75 km).

Pont Ventoux (Val di Susa) hydropower plant, Italy

In addition to the above, it is worth to mention:

- Preliminary and final design of the Valbona hydroelectric power plant reactivation, Italy
- Due diligence of the Pequin hydroelectric plant, Albania
- Due diligence and feasibility study of the new hydroelectric plant Janiski Otoke in Republika Srpska, Bosnia & Herzegovina
- Due diligence for the purchase of the hydropower plants in Duvrava and Lukac, Bosnia & Herzegovina

The company is also involved in the design of Eolic plants.

Here below is the Eolic plant in Al Faw – Iraq whit the first one of a planned wind farm made of 100 similar elements. The wind generator turbine is 120 m high counted at the turbine and it is 190 m in total with a capacity of 2 MW.

Al Faw Eolic power plants, Iraq

Also, it is worth of attention the design of the offshore Wind Farm shown in the below figures and located in Sardinia, Italy

Off shore wind Farm in Sardina, Italy

The company carried out consultancy services for several Photovoltaic Plants.

In the case of the PMC services for 2 Photovoltaic Parks in Milis (Italy), the scope was to build two photovoltaic parks for electricity production of about 12MWp. Each park has a total power generation of about 6 MWp of renewable energy and is located in Milis near Oristano in the Sardinia Island.

Milis Solar power plants, Italy

Worth of attention is the project for the Final Design and environmental impact study of the Photovoltaic plants in Rotello and Montalto di Castro for respectively 57 MW and 78 MW.

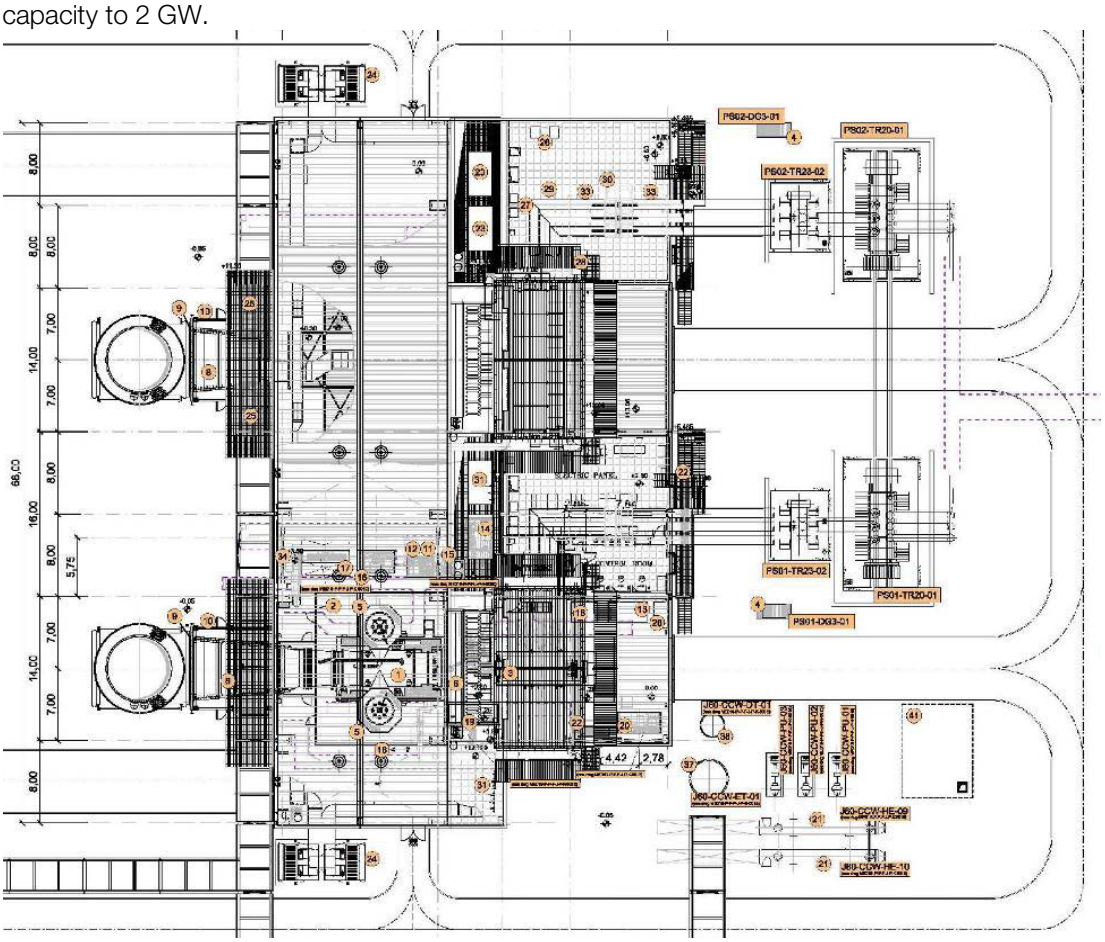
Rotello Solar power plants, Italy

Rotello Solar power plants, Italy

In addition, in is worth to mention:

- Detailed Design and EIA of Palmadula Photovoltaic plant 400 MW
- Detailed Design and EIA of Nuoro Photovoltaic plant 40 MW
- Detailed Design and EIA of Ascoli Satriano plant 90 MW
- Detailed Design, Preliminary layout, and EIA of Torremaggiore plant 90 MW

The company has been working for a power plant inside the port of Al Faw in Iraq. The project had to the consider the need of the new port and of the industrial/urban area in the vicinity of the port itself. The power station is equipped by turbogas turbines fed by fuel oil only in the first stage: in such stage the station is expected to ensure a production of 230 MW. However, the power station design is for modular system able to increase progressively the production capacity to 2 GW.



Al Faw port power station layout and main elements, Iraq

The company has recently been awarded by TERNA (the former national electricity distribution company) with a **framework contract for the detailed design and for the assistance during the implementation of suspended and buried electric backbone lines** for the electricity distribution in the 7 North regions of Italy and in Sardinia.

The most recent projects carried out in this field are illustrated more fully in the following tables and project sheets.

TABLE A – COMPANY'S EXPERIENCE (For titles in **bold** type see project sheets in Appendix A)

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
WASTE TO ENERGY PLANTS						
Updating of the Fume Treatment System of "Silla 2" Waste to Energy Plant in Milan, Italy	AMSA S.p.A.	04/2006	05/2009	PMC	687,000	12,800,000
Waste to Energy Plant of Leghorn, Italy	A.Am.P.S. Spa	01/2004	12/2004	Detailed Design	2,460,000	85,400,000
Waste Pre-Selection and Waste to Energy Plant of "Silla 2" in Milan, Italy	AMSA Spa	01/1999	12/2003	PMC	7,000,000	175,000,000
Waste to Energy Plant of Busto Arsizio, Italy	ACCAM SpA	01/1987	12/2002	Preliminary Design, EIA, Works Supervision	1,400,000	35,000,000
Waste to Energy Plant of Lecce, Italy	Municipality of Lecce	01/1998	12/1998	Detailed design	1,280,000	32,000,000
HYDROELECTRIC PLANTS						
Feasibility Study for the construction of Mini-Hydropower Plants and upgrading the Multisectoral Water System (SIMR) of Noth Sardinia - Italy	OIS – Opere Infrastrutture Sardegna	01/2023	Ongoing	Feasibility Study	200,975	5,736,121
Preliminary design of the upgrade of 7 hydroelectric plants in the Trentino Alto Adige Region, Italy	Hydro Dolomiti Energia S.p.A.	02/2019	12/2021	Preliminary Design	692,000	200,000,000
Detailed design and works supervision of the Arcé hydroelectric plant, Italy	Iniziative Veronesi Srl	10/2017	05/2019	Detailed Design; Works Supervision	1,280,000	17,763,000
Detailed design and works supervision of the Settimo hydroelectric plant, Italy	Iniziative Veronesi Srl	04/2017	05/2019	Detailed Design; Works Supervision	1,280,000	20,807,000

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Due diligence and feasibility study of the hydroelectric plant of Pequin along Pequin-Kavaje canal, Albania	AGSM Verona S.p.A.	11/2015	12/2016	Feasibility Study	39,520	15,000,000
Preliminary and final design of the Valbona hydroelectric power plant reactivation, Italy	AGSM of Verona – Veneto Region	09/2015	12/2015	Preliminary Design	146,000	69,100,000
Due diligence and feasibility study of the new hydroelectric plant Janiski Otoke in Republika Srpska, Bosnia & Herzegovina	AGSM Verona S.p.A.	03/2014	06/2014	Due diligence, Feasibility Study	45,000	17,700,000
Due diligence and assessment of economic benefits of two existing hydropower plants in Durbrava and Lukac, Bosnia & Herzegovina	AGSM Verona S.p.A.	10/2013	02/2014	Due Diligence	60,840	n.a.
Hydrolectric plant of Pont Ventoux in Val di Susa, Italy	AEM, Turin	06/1992	07/1993	Final Design	1,187,800	61,974,800
SOLAR PLANTS						
Agro-photovoltaic plant of Ascoli Satriano - Italy	AGE S.r.l	07/2023	Ongoing	Detailed Design, EIA	224,500	n.a.
Agro-photovoltaic plant of Torremaggiore - Italy	AGE S.r.l	07/2023	Ongoing	Preliminary layout, Detailed design, EIA	233,500	n.a
Feasibility Study and environmental impact study of the Photovoltaic plants in Mumbwa and Shibuyunji - Zambia	AllPro Green Energy	03/2023	Ongoing	Detailed Design, EIA, Feasibility Study	952,380	146,756,892
Detail Design and EIA of Palmadula Photovoltaic plant 400 MW, Italy	AGE s.r.l.	07/2022	Ongoing	Detail Design, EIA	566,000	400,000,000

PROJECT	CLIENT	PERIOD		ACTIVITIES	COST OF SERVICES €	COST OF WORKS €
		FROM	TO			
Detail Design and EIA of Nuoro Photovoltaic plant 40 MW, Italy	AGE s.r.l.	07/2022	Ongoing	Detail Design, EIA	168,000	40,000,000
Final Design and environmental impact study of the Photovoltaic plants in Rotello and Montalto di Castro, Italy	AGE s.r.l.	03/2022	Ongoing	Final Design, EIA,	617,951	120,000,000
PMC for 2 Photovoltaic Parks in Milis, Italy	Milis Energy S.p.A.	10/2010	07/2011	PMC, Works Supervision	236,000	40,000,000
POWER STATION						
Preliminary Desing of an offshore wind farm in Sardinia - Italy	AlternativeGreenEnergy	04/2023	09/2023	Preliminary design, Environmental scoping report, Work cost estimate	150,000	2,655,254,450
Electric Power Station in Al Faw, Iraq	Ministry of Transport of the Republic of Iraq / General Company Ports of Iraq (GCPI)	11/2013	12/2014	FEED Design, Tender Documents	700,000	90,000,000
ELECTRICITY DISTRIBUTION						
Framework contract for implementation of suspended and buried electric backbone lines in 7 North regions of Italy and in Sardinia - Italy	Terna Rete Italia S.p.A.	12/2019	12/2023	Detailed Design, Assistance during construction	2,500,000	n.a.
Engineering Design Services related to Electrical Urban Network for Phase 1 Konza Techno City – Kenya	KoTDA (Konza Technopolis Development Authority)	08/2018	07/2021	Concept/Preliminary, Detailed Design	1,222,310	74,541,465

Appendix A – Company's Experience

Waste to Energy Plants

UPDATING OF THE FUME TREATMENT SYSTEM OF MILAN SILLA 2 WASTE INCINERATOR

Location:	Lombardy, Italy
Client:	AMSA Spa – Milan
Services:	PMC, estimate and accounting of works, safety coordination during execution
Period:	04/2006 - 05/2009
Construction cost:	€ 12,802,744

Project Description:

The existing advanced fume treatment system, completed in 2002, is made up of a two-stage de-dusting line with electrostatic filter and bag filter, a de-acidification dry reactor with powder calcium hydroxide dosing and a non-catalytic reduction system for nitric oxide with urea injection in the combustion chamber (SNCR).

The new project will provide for the installation of a catalytic system for high abatement levels of nitric oxide (SCR) and the replacement of calcium hydroxide with sodium bicarbonate as alkaloid reagent.

These updating works are required in order to keep the waste incineration plant running to ensure waste disposal.

Project Figures:

Wet fumes for treatment	NM^3/h	129,000
Nitric oxide (NO_x) emissions	mg/Nm^3	<50
Hydrochloric acid (HCl) emissions	mg/Nm^3	≤4
Hydrofluoric acid (HF) emissions	mg/Nm^3	≤0.25
Ammonia (NH_3) emissions	mg/Nm^3	≤5

LEGHORN WASTE TO ENERGY PLANT (WASTE INCINERATOR)

Location:	Leghorn – Tuscany, Italy
Client:	A.Am.P.S. Spa – Leghorn
Services:	Detailed design
Period:	01/2004 – 12/2004
Construction cost:	€ 85,400,000.00

Project Description:

Project Figures:

-	Flow capacity	t/day	230
-	Waste LHV	kJ/kg	15,000
-	Thermal capacity	MW	40
-	Steam generation	t/h	50.3
-	Power	MW	10.7

The line includes:

- grate furnace with radiation boiler
- fume recirculation;
- fume dedusting by means of electrofilter and bag filter;
- acid gas removal with wet-type system;
- catalytic reduction system for nitric oxide;
- chemical-physical treatment of process waste;
- energy recovery through steam powered turbo-alternator;
- sludge treatment;
- computer-controlled supervision and monitoring system.

MILAN SILLA 2 WASTE PRE-SELECTION AND INCINERATION PLANT – LOMBARDY

Location:	Italy
Client:	AMSA Spa – Milan
Services:	Project and Construction Management (PMC)
Period:	01/1999 – 12/2003
Construction cost:	€ 175,000,000

Project Description:

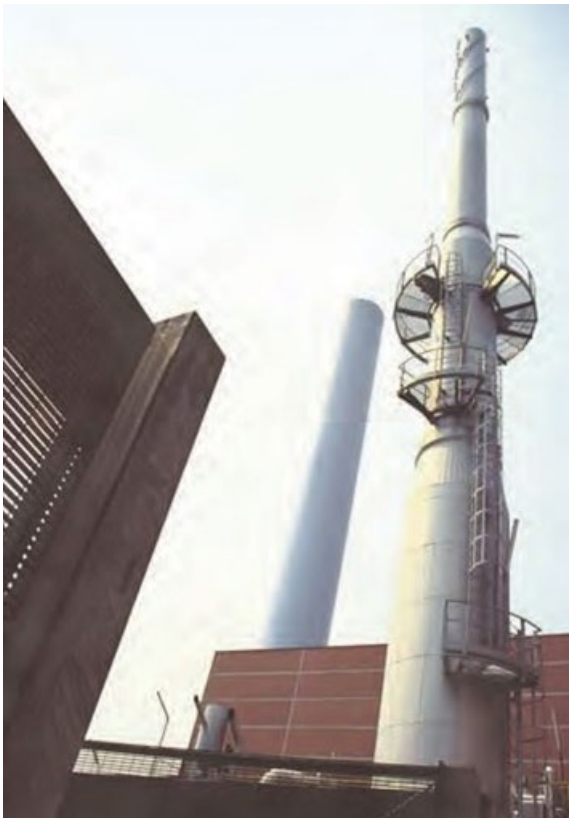
The plant lies north-west to Milan, near Figino, and was built to replace the existing incinerator (named Silla 1).
It was designed and built for thermal waste incineration and co-generation of power and heat for district heating.

At its full capacity the plant can generate sufficient amount of heat to meet the requirements of 15,000 families living in the nearby Gallaratese district and the new Rho-Pero fair- grounds. Also, the plant generates sufficient power to meet annual power requirements of 80,000 families.

The most reliable and innovative technologies were implemented to assure the lowest environmental impact concerning emissions to the atmosphere, noise level, liquid and solid waste, and associated vehicle traffic. Special attention was paid to the implementation of control systems aimed at keeping the low impact values achieved unchanged.

Project Figures:

- Number of lines n 3
- Flow capacity t/h 60.42
- Waste LHV kcal/kg 11,000
- Thermal capacity MW 184.6
- Steam generation t/h 225
- Power MW 59



BUSTO ARSIZIO WASTE INCINERATOR

Location:	Busto Arsizio (Varese) – Lombardy, Italy
Client:	ACCAM SpA – Busto Arsizio
Services:	Preliminary design, Environmental Impact Assessment, Works Supervision
Period:	01/ 1987 –12/ 2002
Construction cost:	€ 35,000,000

Project Description:

The plant has two parallel lines with common waste feed ditch, solid waste processing lines and auxiliary services. From the waste feeding hoppers to furnaces to the atmospheric emissions from the chimney stack, the plant is wholly managed by an automated system controlled by operators from the control room.

Each treatment line has a combustion chamber with horizontal moving grates, a steam generator, a fume purification system (including non-catalytic reduction system for nitric oxide with urea injection, absorption reactor with calcium and activated carbon suspension for acid gas treatment and removal of micro-polluting compounds, de-dusting system by means of a bag filter and the absorption process with a soda solution) and a fume evacuation system (with a fan, a heat exchanger and a stack). Each line is also provided with thermal cycle with a turbo-alternator and air condenser.

Project Figures:

- Number of lines n. 2
- Flow capacity t/h 21
- Waste LHV kcal/kg 2,200
- Thermal capacity MW 53.7
- Steam generation t/h 55
- Power MW 9.2

LECCE WASTE INCINERATOR (PUGLIA)

Location:	Italy
Client:	Municipality of Lecce
Services:	Detailed Design, Environmental Impact Assessment
Period:	1998
Construction cost:	€ 32,000,000.00

Project Description:

Project Figures:

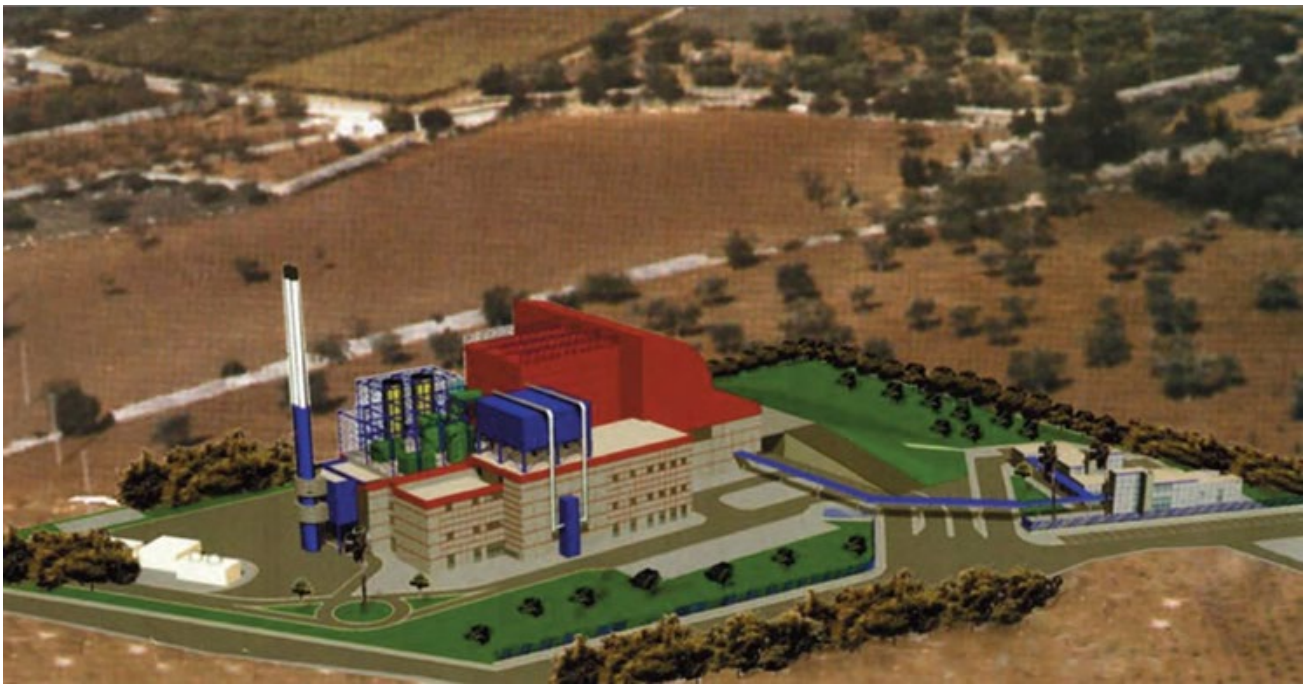
- Number of lines n. 2
- Flow capacity t/h 13
- Thermal capacity MW 26.5
- Power MW 9.2

The Project:

The project developed the plant on two parallel lines with common waste feed ditch, as well as solid waste treatment plants and auxiliary services.

Each line includes:

- combustion chamber with grate system;
- steam generator;
- fume purification system;
- fume evacuation system;
- thermal cycle with a turbo-alternator and air condenser.



Hydroelectric Plants

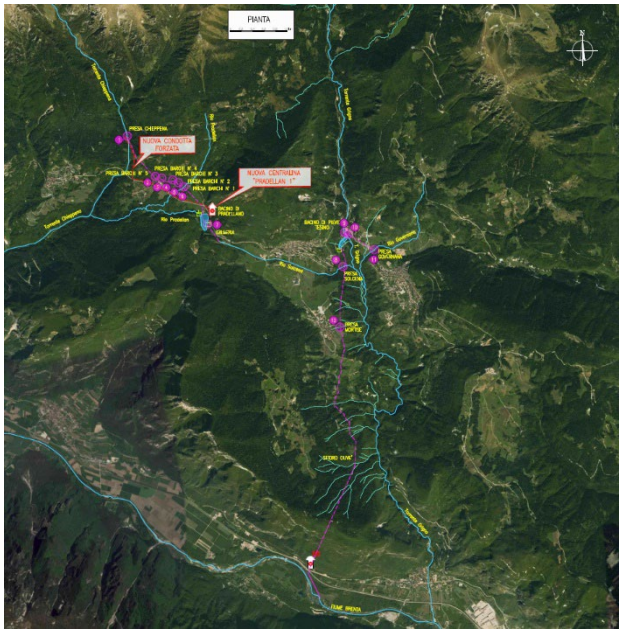
PRELIMINARY DESIGN OF THE UPGRADE OF SEVEN HYDROELECTRIC PLANTS IN THE TRENTINO ALTO ADIGE REGION

Location:	Italy, Trentino – Alto Adige
Client:	Hydro Dolomiti Energia S.r.l.
Services:	Feasibility Study
Period:	02/2019 – 07/2021
Construction cost:	€ 58.063.857,21 (Carzano Plant), € 49.600.594,63 (Avio – Prà da Stua Plant), € 5.388.253,75 (Val Noana Plant)

Project Description:

The services involved a critical analysis of 7 hydroelectric plants, identifying possible upgrade interventions aim to increasing energy production, studying the environmental impact of each intervention.

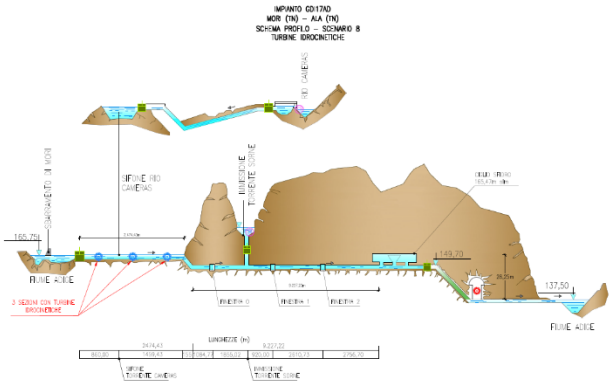
Firstly, a hydrological model for the watershed subtended by each hydroelectric plant has been set up, once known the volume of water available for each plant, possible upgrade interventions have been studied, with the aim of optimizing the use of water, increasing, if possible, the production of energy. Each project scenario has been studied with a calculation algorithm expressly developed for the services. The algorithm simulates the operation of each hydroelectric plant in each project scenario, allowing to estimate the energy production with the volume of water available calculated with the hydrological model.



Each project scenario has been studied considering the annual volume of water typical of the current climate scenario and considering two different future climate change scenarios, characterized by two different trend of CO2 emissions (one lower and one higher), comparing the results of each scenario in terms of energy production.

The Project Scenarios analyzed the design of:

- Kilometres of pressure pipes with diameters up to 5 m;
- new hydroelectric plants (25 MW);
- installation of hydrokinetic turbines;
- new water intake structures;
- new pump station (25 MW).



DETAILED DESIGN AND CONSTRUCTION SUPERVISION OF ARCE' HYDROELECTRIC PLANT

Location:	Arcé di Pescantina (Verona) - Italy
Client:	Iniziative Veronesi Srl
Services:	Detailed design, works supervision
Period:	10/2017 – 05/2019
Construction cost:	€ 17,763,000

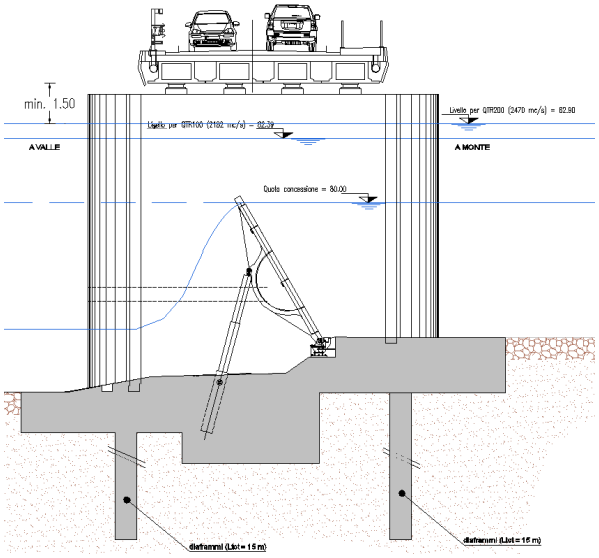
Project Description:

The project is for an hydro-electric plant along the Adige river in the section between Santa Lucia and Arcè di Pescantina.
The plant has been designed to have a very low environmental impact, as it immediately returns waters downstream and it exploits just a part of them whereas the outstanding part keeps on flowing freely.
In addition to the works concerning the hydro-electric plant, the project foresees the requalification and strengthening of the bridge called "Arcè di Pescantina bridge" on the Adige river. It allows the road link between Arcè and Bussolengo.
The main project features are:

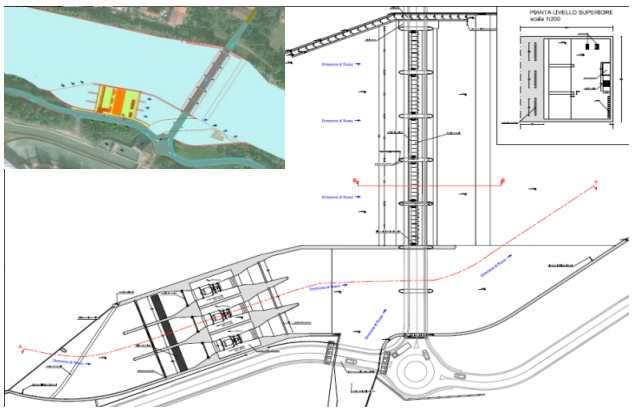
- a lock with 5 flap gates on the bottom, at the Adige river talweg level, for the purpose of supporting the river level and creating the hydroelectric leap;
- a new bridge supported by 7 new piles in riverbed with deck made up of prefabricated beams each with a 18.00 m span and a prefabricated beam with 20.50 m span;
- a fish ladder on the left bank;
- a canoes slide on the left bank;
- a completely underground hydro-electric plant on the right bank, in the Bussolengo Municipality, with intake upstream of the bridge and outlet immediately downstream;
- road link on the Bussolengo side and access road to the plant area;
- small works of road adaptation and link on the Pescantina side.

The hydro-electric plant will be placed in an uncultivated area along the river on the right bank. The river hydraulic flows intake will be just upstream of the river and the flows outlet will be just downstream.

All the hydraulic works related to the plant will be underground and at the same level as the river talweg which is far below ground level.
The plant emerging works are just some access works containing the screen remover to clean the intake grids and the equipment delivering the energy produced.
The hydro-electric plant will produce about 3 MW power for an annual total of about 21.2 GWh; the energy produced will be then entering into the grid by a connection with a medium voltage line already existing.
The lock is made up of five spans, each is 16.5 m wide and they are regulated by as many flap gates, with a water retention level of 79.95 m above sea level, i.e. 5 cm less than the higher free surface (80.00 m above sea level.).



Taking into account the dimensions of the lock piles, each of which is 1.5 m, the lock total width is 95.6 m; in addition to such width 15 m length below the first left bridge span is to be added. Such 15 m length is left free for the public equipped area . The flap gates movement is controlled and regulated by an hydraulic mechanism which triggers the two cylinders at the end of each gate. The cylinders are placed at the back of the gates and they are embedded in the riverbed piles in order to avoid damaging the devices during extraordinary floods. The maximum grade of operating gates is 60° horizontally. The hydraulic plant pipes are placed in a water-tight inspection shaft which can be checked. It is closed by ballasted sheets or concrete slabs and it is placed downstream of the gates. Guide rails have been set upstream and downstream of the gates to close the span by means of mobile boards if it is not possible to carry out otherwise the extraordinary maintenance operations on the mechanical devices The project envisages along its length an accessible inspection shaft where the hydraulic and electric systems pipes are located.



DETAILED DESIGN AND CONSTRUCTION SUPERVISION OF SETTIMO HYDROELECTRIC PLANT

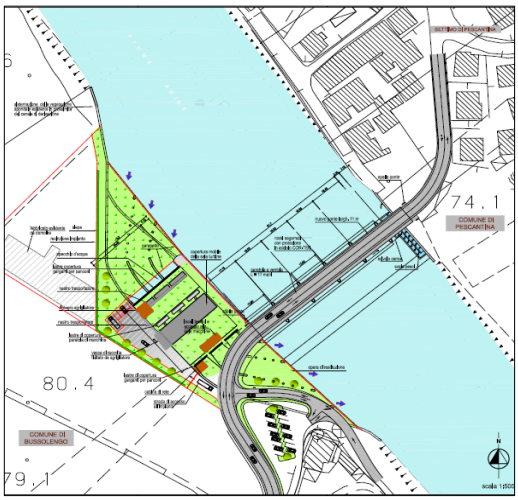
Location:	Settimo di Pescantina (Verona) - Italy
Client:	Iniziative Veronesi Srl
Services:	Detailed design, work supervision
Period:	04/2017 – 05/2019
Construction cost:	€ 20,807,000

Project Description:

The project is for an hydro-electric plant along the Adige river in the section between Pescantina and Verona.
The plant has been designed to have a very low environmental impact, as it immediately returns waters downstream and it exploits just a part of them whereas the outstanding part keeps on flowing freely.
In addition to the works concerning the hydro-electric plant, the project includes the requalification and strengthening of the bridge called “Settimo di Pescantina bridge” on the Adige river. It allows the road link between Pescantina and Bussolengo.
The main project features are:

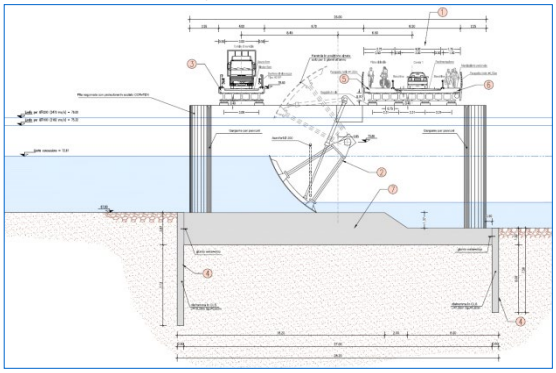
- a lock with 5 flap gates on the bottom, at the Adige river talweg level, for the purpose of supporting the river level and creating the hydroelectric leap;
- a new bridge supported by 5 new piles in riverbed with deck made up of prefabricated beams each with a 18.50 m span;
- a fish ladder on the left bank;
- a canoes slide on the left bank;
- a completely underground hydro-electric plant on the right bank, in the Bussolengo Municipality, with intake upstream of the bridge and outlet immediately downstream;
- road link on the Bussolengo side and access road to the plant area;
- small works of road adaptation and link on the Pescantina side.

The hydro-electric plant will be located in the area where a plant for the treatment of stones and marbles along the river on the right bank used to be operative. The river hydraulic flows intake will be just upstream of the river and the flows outlet will be just downstream.

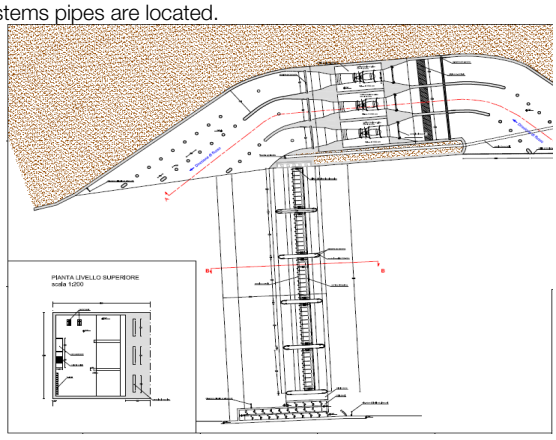


The area occupied by the plant will be about 45 m wide and about 100 m long in parallel with the river. All the hydraulic works related to the plant will be underground and at the same level as the river talweg which is far below ground level. The surface over the plant and the intake and outlet channels will be occupied upstream by a large garden and parking area, downstream of the new road link to the bridge, near the 18th century Corno Church.
The area surrounding said church will be rearranged and improved and even expanded in respect to the existing one.

The plant emerging works are just some access works containing the screen remover to clean the intake grids and the equipment delivering the energy produced.
The hydro-electric plant will produce about 3 MW power for an annual total of about 21.3 GWh; the energy produced will be then entering into the grid by a connection with a medium voltage line already existing.
The lock is made up of five spans, each is 17 m wide and they are regulated by as many flap gates, with a water retention level of 72.56 m above sea level, i.e. 5 cm less than the higher free surface (72.61 m above sea level.).



Taking into account the dimensions of the lock piles, each of which is 1.5 m, the lock total width is 92.5 m; in addition to such width the canoes slide 2.5 m width and the fish ladder total 7.1 m width are to be added. The total width of the works in the riverbed is therefore more than 100 m. The flap gates movement is controlled and regulated by an hydraulic mechanism which triggers the two cylinders at the end of each gate. The cylinders are placed at the back of the gates and they are embedded in the riverbed piles in order to avoid damaging the devices during extraordinary floods. The maximum grade of operating gates is 60° horizontally. The hydraulic plant pipes are placed in a water-tight inspection shaft which can be checked. It is closed by ballasted sheets or concrete slabs and it is placed downstream of the gates. Guide rails have been set upstream and downstream of the gates to close the span by means of mobile boards if it is not possible to carry out otherwise the extraordinary maintenance operations on the mechanical devices. The project envisages along its length an accessible inspection shaft where the hydraulic and electric systems pipes are located.



PRELIMINARY AND FINAL OF THE VALBONA HYDROELECTRIC POWER PLANT REACTIVATION

Location:	Italy
Client:	AGSM of Verona
Services:	Preliminary design
Period:	09/2015 – 12/2015
Construction cost:	€ 69,100,000

Project Description:

AGSM Verona S.p.A. appointed Technital S.p.A. to draw up the preliminary and final design of the Valbona hydroelectric power plant reactivation.

The Valbona plant is able to exploit the Ala river flows by means of an intake placed in Acque Nere, at 606 m above sea level, which supplies a 7.8 km long trapeizodal section channel. Such channel is made up of prefabricated pre-stressed reinforced concrete segments and carries through gravity (1.3% slope) a 600 l/s maximum flow up to the load tank.

The channel is placed on the right side of the valley and it is subject to rock falls events from the rocky walls above. In the past, maintenance interventions were carried out due to such events. Moreover in those sections concerned by moraine or debris deposits during extraordinary weather conditions landslide events such as mud flow – debris flow may occur, affect some channels sections and take them away. The channel breaking and the following water spill entails other and more serious landslides in the sections downstream of the damages. These landslides are very dangerous in the works lower half as there are roads and buildings which are supposed to be concerned both by the landslides and by the flow issued by the channel in an uncontrolled way.

The Valbona power plant is able to produce nearly 2 MW power by exploiting a derivation concession of a maximum 600 l/s flow taken from the Ala river, with a useful difference in height of 390 m. The structure is as follows:

1) Water intake on Ala river in Acque Nere, with a maximum level of the free water at 605.80 m on above sea level;
2) Pre-stressed reinforced concrete trapezoidal section channel (bases 1.10 and 0.70 m, height 0.75 m) laid on level on concrete plinths cast against rock which is about 7.8 km long and constant slope equal to 1.3%; two canal bridges grant continuity on the Delle Chiese and Muravalle valleys and 3 tunnels;
3) Load tank in Pozzo Basso, with 595.5 m above sea level retaining level;
4) DN 500 mm 660 m long penstock to supply centrally the plant;
5) DN 250 mm 660 m long penstock to discharge overflow;
6) Plant with Pelton turbin with axis at 206.20 m.

The channel is equipped with an automatic closing system which is triggered in case of break. It is made up of a gate placed at about half the length. It blocks the flow and it discharges it into a side small valley which reaches then the valley bottom and the Ala river.

The following scenarios have been studied:

1) Valbona plant revamping, renovation of the intake and disposal of the channel, carrying out of a penstock on a forest/municipal road with a constant DN 800 mm diameter, and carrying out of pumping at the load tank towards the Speccheri penstock;
2) Valbona plant revamping, renovation of the intake, restoration and safety of the by-pass I-II-III sections, carrying out of a by-pass tunnel of sections IV and its disposal, carrying out of pumping at the load tank towards the Speccheri penstock;

2bis) Valbona plant revamping, renovation of the intake, restoration and safety of the by-pass I -III sections, carrying out of a by-pass tunnel of sections III – IV and their disposal, carrying out of pumping at the load tank towards the Speccheri penstock;

3) Valbona plant decommissioning, renovation of the intake and disposal of the channel; carrying out of a by-pass tunnel of by-pass sections I-II, of a new load tank and pumping; new medium voltage supply line and a new penstock towards the Specchieri penstock;
4) Valbona plant revamping, renovation of the intake and disposal of the channel; carrying out of a by-pass tunnel of by-pass sections I-II, of a new load tank and of a DN 800 mm penstock on forest/municipal road; carrying out of pumping at the load tank towards the Speccheri penstock.

The total project scenarios are 11.

The analyses carried out have allowed to point out as follows:

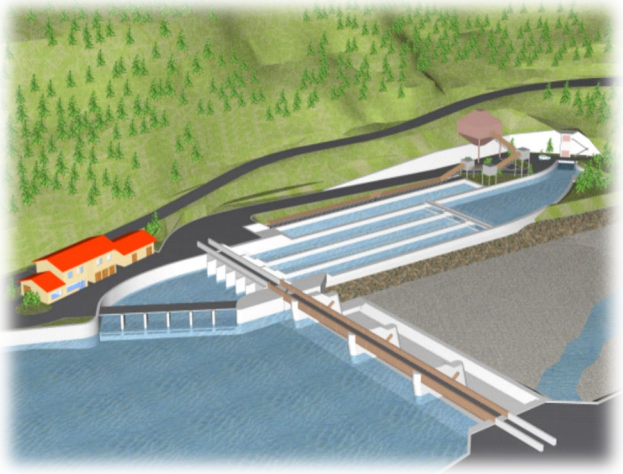
- Taking into account only the profitability parameter with reference to the investment costs seems partially misleading as the solutions A and B and the related Bis corollary solutions always have weak features which are linked to the position of the channel or of the pipe replacing it. The rock wall and the slope instability on which the channel or the new pipe is placed is not a sufficient guarantee for the need to carry out future maintenance interventions, even heavy interventions. Such interventions may increase the cost evaluation which may reach values next to the values of other solutions, mainly solutions 1 and 2;
- The final solution to be adopted must be chosen by taking into account not only the reference economic parameters but all the comparison parameters elements indicated above;
- Foreseeing tunnels instead of transfer pipes do not entail significant positive effects as the reasonably eligible tunnels dimensions in the Ronchi valley do not allow more than daily adjustments and it significantly reduces the positive effect of a possible accumulation.

HYDROELECTRIC POWER PLANT OF PONT VENTOUX IN SUSA VALLEY

Location:	Piedmont Region, Italy
Client:	Temporary Association of contractors (Spie Battignoles, Grandi Lavori Fincosit, Vianini, Condotte) for "Azienda Elettrica Municipale (AEM)" of Turin
Services:	Final design
Period:	06/1992 – 07/1993
Construction cost:	€ 61,974,800

Project Description:

The AEM of Torino has tendered the construction of the new Hydroelectric Plant of Pont Ventoux, in Val Susa, which foresees the partial utilisation of Dora Riparia river waters.



The project includes:

- the main diversion structure constituted by a dam on Dora Riparia River, a water intake structure and all ancillary works;
- a free surface offtake canal constructed in tunnel for a length of 14 km and a peak flow of 30 m3/sec.;
- a regulating reservoir in Val Clarea of 560,000 m3 capacity, constituted by a 33 m. high dam and bypass canal;
- pressure tunnel of 2.75 km in length connected to a pressure steel pipeline of 685 m. in length and 2.8 m. dia.;
- electric power plant of 388 GW;
- ancillary works such as access roads and tunnels, restitution canal etc.

The project was carried out in association with Electricitè de France and Coyne et Bellier of France.

Works under construction and after completion

Solar Plants

AGRO-PHOTOVOLTAIC PLANT OF ASCOLI SATRIANO

Location:	Italy, Ascoli Satriano and Candela
Client:	AGE S.r.l
Services:	Detailed design, EIA
Period:	07/2023 - Ongoing
Construction cost:	n.a.

Project Description:

The aim of the project is to provide the detailed design of an agro-photovoltaic plant system with a total power of approximately 90 MW, and related connection to the electrical grid, equipped with a storage system with a power of approximately 20 MW to be built in the municipality of Ascoli Satriano and Candela (FG).

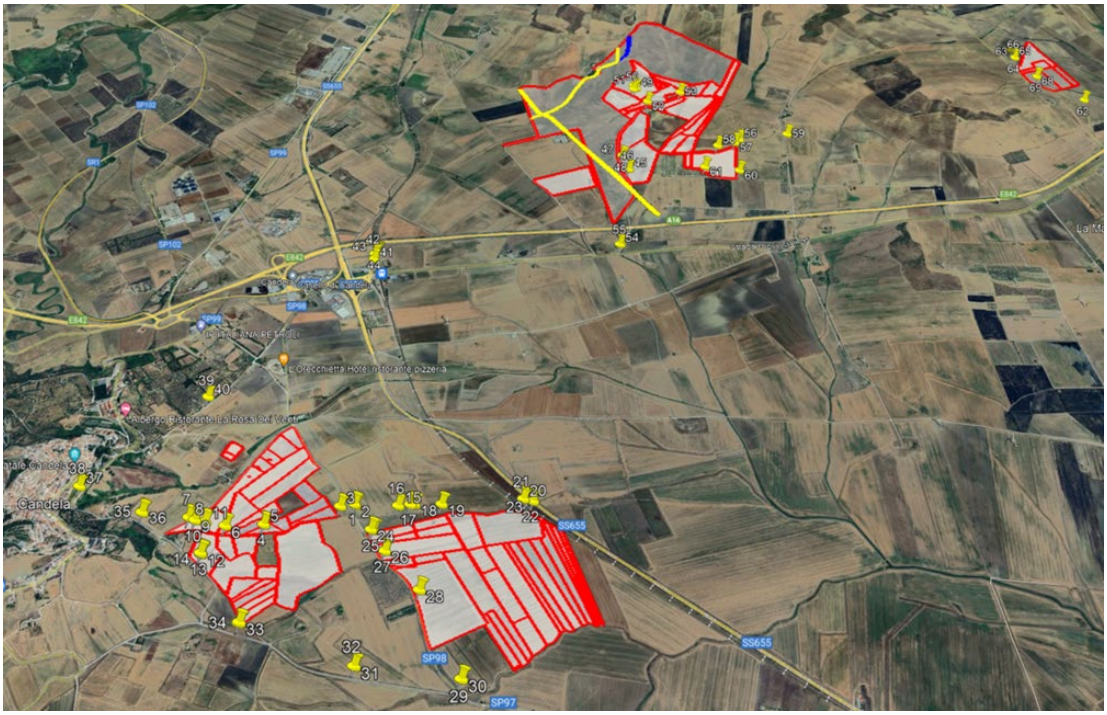
The agro-photovoltaic plant is divided in four parts: three lots on which the agrovoltaic generator will be installed and a smaller lot where the storage will be installed together with some photovoltaic generation.

The service concerns electrical project and EIA. These elaborations will be used in the procedure for the permitting (in Italy is called Autorizzazione Unica).

The project has been developed according to CEI (Comitato Elettrotecnico Italiano) norms for the electrical part and according to Italian regulations for the environmental impact assessment (Legislative decree n. 42/2004 and local dispositions).

The company has developed the installations of ground mounted trackers (N-S axis with backtracking) equipped with 710 Wp bifacial modules. The energy will be converted and transformed by 6400 kVA inverter stations, and the grid connection will be performed by a MV/HV substation 132/30kV connected to a 132kV stall of a new HV grid substation.

The territory presents slopes on the two lots while the third lot has a flat layout. Therefore, in the two irregular lots, the areas with slopes greater than 20% on the NS and EW axes were discarded for the installation of the trackers.



FINAL DESIGN AND ENVIRONMENTAL IMPACT STUDY OF THE PHOTOVOLTAIC PLANT IN PALMADULA - AGRO-PHOTOVOLTAIC SYSTEMS 400 MWP

Location:	Italy, Palmadula
Client:	AGE S.r.l.
Services:	Final Design, EIA
Period:	09/2022 –Ongoing
Construction cost:	€ 400,000,000.00

Project Description:

The engineering consultancy services cover final design and environmental impact study (EIA) aiming at obtaining permission from the Ministry of Ecological Transition (MITE) to build and operate a 400MW agro-photovoltaic plant in the Municipality of Palmadula (SS).

The services provided include electrical design of the photovoltaic generator, high voltage substation, design of the tracking photovoltaic generator, design of the storage system (BESS), agronomic and environmental mitigation design, geological, hydraulic and environmental investigations and reports, landscape study for harmonization with the surrounding landscape, studies and environmental impact assessments, archaeological reports, expropriation practices, structural calculations, construction site organization and structure, safety and coordination plans.

The agro-photovoltaic plant of Palmadula is located in an area of about 900ha, with a power of 400MW and an energy storage BESS of 80MWh.

The new plant is in an area with existing crops. The territory is heterogeneous with natural slopes, flat parts, and some depressions. The problems to be addressed are mainly of an archaeological and landscape nature, with also the presence at times of landslides and hydrogeological constraints. Agro-photovoltaic systems are a newcomer in the regulatory landscape in Italy. There are currently no specific laws but the decree of the Ministry of Ecological Transition – MITE- issued in June 2022.

FINAL DESIGN AND ENVIRONMENTAL IMPACT STUDY OF THE PHOTOVOLTAIC PLANT IN NUORO - AGRO-PHOTOVOLTAIC SYSTEMS 40 MWP

Location:	Italy, Nuoro
Client:	AGE S.r.l.
Services:	Detailed Design, EIA
Period:	09/2022 –Ongoing
Construction cost:	€ 40,000,000.00

Project Description:

The engineering consultancy services cover final design and environmental impact study (EIA) aiming at obtaining permission from the Ministry of Ecological Transition (MITE) to build and operate a 40MW agro-photovoltaic plant in the Municipality of Nuoro (NU).

The services provided include electrical design of the photovoltaic generator, high voltage substation, design of the tracking photovoltaic generator, design of the storage system (BESS), agronomic and environmental mitigation design, geological, hydraulic and environmental investigations and reports, landscape study for harmonization with the surrounding landscape, studies and environmental impact assessments, archaeological reports, expropriation practices, structural calculations, construction site organization and structure, safety and coordination plans.

The agro-photovoltaic plant of Nuoro is located in an area of about 60ha, with a power of approx. 40MW and an energy storage BESS of 22MWh.

The new plant is in an area with existing crops. The territory is heterogeneous with natural slopes, flat parts and some depressions. The problems to be addressed are mainly of an archaeological and landscape nature, with also the presence at times of landslides and hydrogeological constraints. Agro-photovoltaic systems are a newcomer in the regulatory landscape in Italy. There are currently no specific laws but the decree of the Ministry of Ecological Transition – MITE- issued in June 2022.

FINAL DESIGN AND ENVIRONMENTAL IMPACT STUDY OF THE PHOTOVOLTAIC PLANTS IN ROTELLO AND MONTALTO DI CASTRO

Location:	Montalto di Castro (VT), Rotello (CB), Italy
Client:	AGE S.r.l.
Services:	Detailed Design, EIA
Period:	03/2022 - Ongoing
Construction cost:	120.000.000,00 €

Project Description:

The consultancy engineering services cover final design and environmental impact study (EIA) aiming at obtaining permission from the Ministry of Ecological Transition (MITE) to build and operate two agro-photovoltaic plants in the Municipality of Montalto di Castro (VT) of 78MW and in the Municipality of Rotello (CB) of 57MW.

The services provided are for electrical design of the photovoltaic generator, high voltage substation, design of the tracking photovoltaic generator, design of the storage system (BESS), agronomic and environmental mitigation design, geological, hydraulic and environmental investigations and reports, landscape study of integration into the territory, studies and environmental impact assessments, archaeological reports, expropriation practices, structural calculations, construction site organization and structure, safety and coordination plans.
The agro voltaic plant of Montalto is located in an area of 174ha, with a power of 78MW and an energy storage BESS of 8MWh; The agro voltaic plant of Rotello is located in an area of 132ha, with a power of 57MW and an energy storage BESS of 10MWh.

The agro voltaic plant of Montalto is located in an area with existing crops. The territory has a flat conformation, with various depressions especially in the Rotello area. The problems to be addressed are above all an archaeological and landscape nature, with the presence at times of landslides and hydrogeological constraints. Agro-photovoltaic systems are a newcomers in the regulatory landscape in Italy. There are currently no specific laws but the decree of the Ministry of Ecological Transition – MITE- issued in June 2022.

PROJECT MANAGEMENT SERVICES FOR THE CONSTRUCTION OF 2 PHOTOVOLTAIC PARKS OF 5.9 MW EACH IN THE MUNICIPALITY OF MILIS

Location:	Italy
Client:	MILIS Energy S.p.A.
Services:	Project and construction management; Works' supervision
Period:	10/2010 – 07/2011
Construction cost:	€ 40,000,000

Project Description:

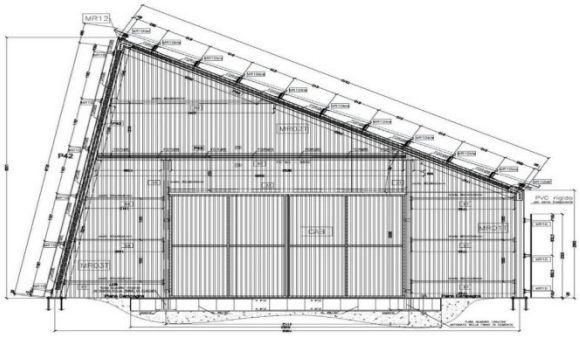
The scope of work is to build two photovoltaic parks for electricity production of about 12MWp. Each park has a total power generation of about 6 MWp of renewable energy and is located in Milis near Oristano in the Sardinia Island. The two photovoltaic parks are called respectively MILIS1 and MILIS2.

The project consists in the construction of greenhouses (steal structural works) upon which the photovoltaic panels are installed.

The greenhouses of the MILIS 1 plant are 49 of the same size, plus a smaller one.

The greenhouses of the MILIS 2 plant are 49 of the same size, plus a smaller one.

The 98 greenhouses (MILIS1+MILIS2) are 99.53 m long and 7.9 m wide; the two smaller greenhouses are 28.44 m long and 7.9 m wide. The foundations of the greenhouses are composed by plints for a total of 4340 plinths.



The greenhouses are designed for farm cultivation, and in particular, for the first two years, there will be a plantation of alfalfa.

The choice to install the photovoltaic panels on the top of the greenhouses, allows the maximum Italian economic incentives according to the present Italian law for the production and sale of renewable Energy.

In each greenhouse there are 630 panels and in the two smaller greenhouses there are 180 panels.

In total both in MILIS1 and MILIS2 there are 31050 panels for a total of 62100 panels.

Each of them has a nominal peak power of 190 W.

The parks will be connected to the first electricity cabin located in Narbolia (about 8.8 km from Milis) provided by the distribution operator (Enel distribution S.p.A.).

The photovoltaic parks are under construction by TERNYENERGIA S.p.A.

The activity required to Technital was the supervision of the works. Team was also be in charge of the following tasks:

- Convening and chairing the meetings to define the project contents and the schedule of the activities, to check that all the necessary authorisation procedures are abided by, and to solve possible critical situations that may happen during the works;
- Before the approval of the Detailed Design, verifying the conformity of the document contents with the existing regulations, with the instructions of the Final Design, the available financial supplies, as well as the existence of the technical and administrative elements necessary to obtain the complete availability of the areas and of the parks;
- Supporting the Client in drafting all the documents and the correspondence necessary to assure that the project progresses smoothly, with regard to the design, authorisation and works execution aspects;
- Verifying the date of the real start of the works and of any other deadline referring to the works progress;
- Making sure that all contractual requirements are obeyed, informing the Client about possible defaults and delays by the EPC in the execution of the works, suggesting remedial actions in order to reduce delays to the utmost.

Power Station

PRELIMINARY DESING OF AN OFFSHORE WIND FARM IN SARDINIA

Location:	Italy, Portoscuso, Sardinia
Client:	AlternativeGreenEnergy
Services:	Preliminary design, environmental scoping report, work cost estimate
Period:	04/2023 – 09/2023
Construction cost:	€ 2,655,254,450

Project Description:

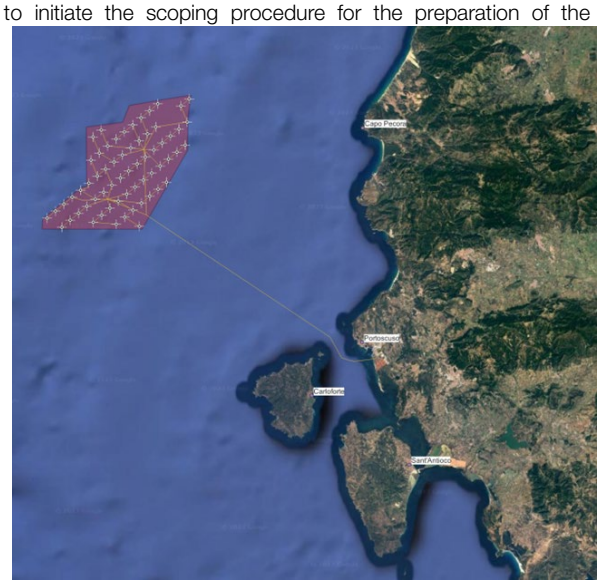
Offshore wind energy has shown enormous potential for sustainable energy production due to intense winds in marine areas and the reduced impact on the landscape due to its distance from the coast.

The project foresees the development of a wind farm off the coast of Sardinia, Italy, consisting of 63 wind turbines that will provide 945 MW of power to the national grid, located about 33 km from the town of Portoscuso and more than 26 km from the coast of the island of Carloforte.

A double trio of submarine cables will run from the wind farm to the connection point located on the coast of the Portovesme industrial area (Sardinia). An electrical user substation (SSEU) reached by the submarine cable, is planned to be built in an area close to the "Sulcis" power plant, for which Terna S.p.A. has approved the connection to the national transmission grid. An electricity storage system called Battery Energy Storage System (BESS) will be built in an area close to the SSEU, consisting of a park with several lithium-ion batteries with a total capacity of 360 MWh and a discharge time of 4 hours.

The service consists in carrying out the preliminary plant design and analysis of the wind farm's yield and productivity. Different options were evaluated for anchoring the floating platforms and developed the preliminary design of the floating structures for the wind turbines and for the floating substations, as well as the study of the cables connecting the turbines and those transporting the energy to the mainland.

In addition, the preliminary environmental study was developed to initiate the scoping procedure for the preparation of the



environmental impact assessment report.

The project area is divided in two subfields, each composed by 31-32 wind turbines and a floating electrical substation.

The wind turbine is a Vestas model V236 with a rated output of 15 MW, a prototype of which successfully passed the first production tests. The main operating characteristics were assumed as:

Rotor diameter	236 m	Hub height	123.8 m
Swept area	43743 m2	Blade length	115.5 m
Max. height	241.8 m	Tower height	119 m

The two offshore electrical stations of floating type are arranged in a barycentric position with respect to the wind power subfields. To each of them, on the AT 66KV side, 8 lines from the wind power subfields are connected, each consisting of groups of 3-4 wind power generators.

The offshore electrical station contains the high-voltage equipment and machines and additional elements serving the main plant, as well as auxiliary equipment for management, communication, hospitality, etc. with power factor correction systems. They will be machines with KNAF-type cooling, i.e. organic oil with forced air cooling.

Wind turbines and transformer substations are located on semi-submersible steel structures anchored to the bottom with a system of pre-tensioned catenaries. The structure is composed of three columns, arranged at a 120° angle to each other and connected by tubular or rectangular cross-pieces of naval type on the lower level and by smaller tubular cross-pieces on the upper level to support the connecting gangway that allows access from the dock installed on one of the three columns. Inside all the columns are ballast water tanks, which are stored in smaller quantities at the wind tower for trim reasons. Each column is equipped with three double mooring lines of pre-tensioned catenaries.

For the electrical transformer substation, the floating foundation structure will have a rectangular plan and the mooring lines will be connected in pairs to each column.

Prior to the actual development of the project, a thorough analysis of available data was carried out with regard to the bathymetry of the seabed, current spatial planning, environmental and geomorphological evidence, and the analysis of prevailing winds. All the information gathered in this way was entered into a georeferenced database, so that it could be consulted and represented by proceeding in successive steps to refine the design solution.

The most interesting areas from a production point of view were identified, imposing a distance from the coast greater than 12 nautical miles to reduce impacts on the landscape and navigation routes. Using GIS software, the other plants for which a public concession was requested were identified, located, and drawn, plotting the coordinates of the wind turbines and water surfaces identified by the proponents.

Two macro-areas were then identified in which a detailed analysis was carried out, taking into account any obstacles, primarily environmental and geomorphological, thus obtaining detailed areas that were analysed for comparison.

Having identified the most interesting area to the west of the town of Portoscuso, in the province of Cagliari (Sardinia), a hypothesis was developed with two subfields and the foreseen number of wind turbines.

The project has been submitted to the Italian Ministry of Infrastructures and the Coastal Guard for the state concession of the marine area. Consequently, the project underwent an environmental scoping procedure to define the content and methodology of the environmental impact assessment, to be carried out at a later project level, following the Italian Environmental Law n°152 of 2006.

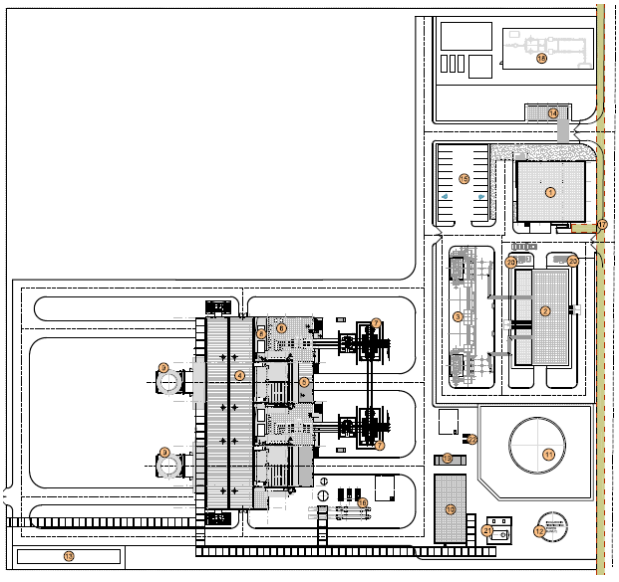
ELECTRIC POWER STATION IN AL FAW

Location:	Iraq, Al Faw
Client:	Ministry of Transport of the Republic of Iraq / General Company Ports of Iraq (GCPI)
Services:	Design and Tender Documents (FIDIC yellow book)
Period:	11/2013 – 12/2014
Construction cost:	Euro 90,000,000

Project Description:

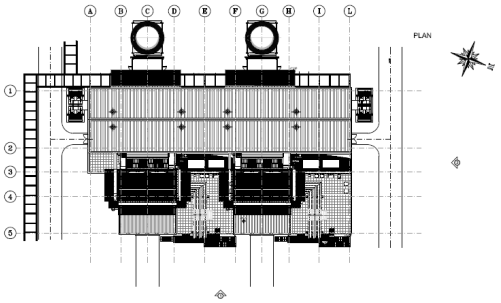
The area on which the Al Faw Grand Port is under development is not currently served by the national High Voltage network; consequently, it was planned to build a power plant that, in the first stage, will work in islanded configuration. Given the development programs of the port that involve a period of approximately twenty years, it was decided to propose a modular plant capable of satisfying energy requirements in various steps, also foreseeing the future availability of a national HV/MV network. The expansion includes both power station and distribution system, according to an expected load increasing of the port area.
The power station for this stage of development of the port is composed by Nr. 2x115 MW gas turbines, fed by fuel oil Each turbine is equipped with a synchronous generator; 175 MVA (at 40°C), 15 kV +/- 5%, cos =0,8. Fuel oil storage will be provided through the Tank Area, completed with the relevant pumping system, with a total capacity of 60,000 m3. The storage will ensure 45 operation days.

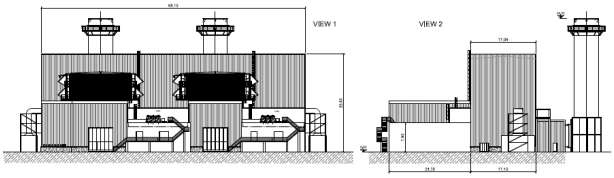
The power plant conveniently is located close to the tank farm and to the desalination plant. In this way, feeding of power station from fuel tanks and the steam supply from power station to desalination plant are facilitated, as well as fuel unloading from the barges.

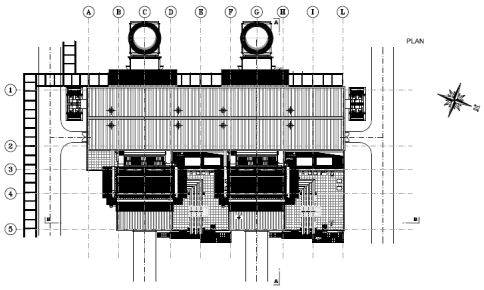


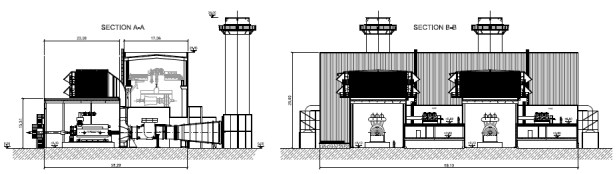
The power station includes the following systems:

- Air intake system
- Exhaust system
- Fuel gas supply system
- Diesel fuel oil system
- Lube oil and rotor lifting system for GT and generator
- Hydraulic oil system
- Closed Cycle Cooling Water (CCCW) System
- Demi water System
- Compressed air System
- Buildings:
  - Gas turbine enclosure,
  - Gas Turbine Building (“Power house”), equipped with crane for rotor lifting
  - Demi-water and Fire Fighting Pumps Building
  - Guardhouse Building
- Fire fighting system
- Fire detection systems
- Natural gas detection system
- Ventilation, heating and air conditioning systems
- Fuel Gas Pressure Reducing Station (common for n°2 GT)
- Chimney, about 35 m high
- Diesel emergency generator for start-up, about 5 MVA power
- Control system









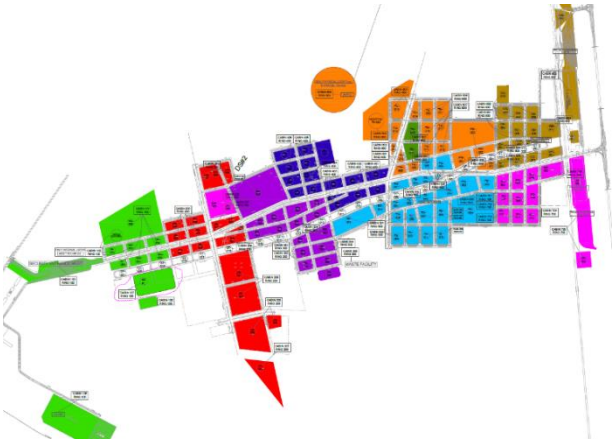
Electricity Distribution

ELECTRICAL DESIGN SERVICES FOR PHASE 1 KONZA TECHNO CITY

Location:	Kenya, Machakos County
Client:	DELMA UK (ICM Group); final Client: KoTDA (Konza Technopolis Development Authority)
Services:	Concept/Preliminary, Detailed Design (approved for construction)
Period:	08/2018 – 07/2021
Construction cost:	Aprox € 66,000,000

Project Description:

The Konza Technology City (KTC) is a project of the Government of Kenya (GoK), implemented through EPCF (Engineering, Procurement, Construction and Finance) by the Konza Technopolis Development Authority (KoTDA), under the Ministry of Information and Communication Technology (MOICT). Konza City will be constructed over a 5000-acre land, located approximately 60 Km south of Nairobi Center. The city is designed to allow phased development, and Phase 1 includes various types of land uses and infrastructures that would support future phases of development. The project, implemented through EPCF (FIDIC Silver Book), concerns the development of a new

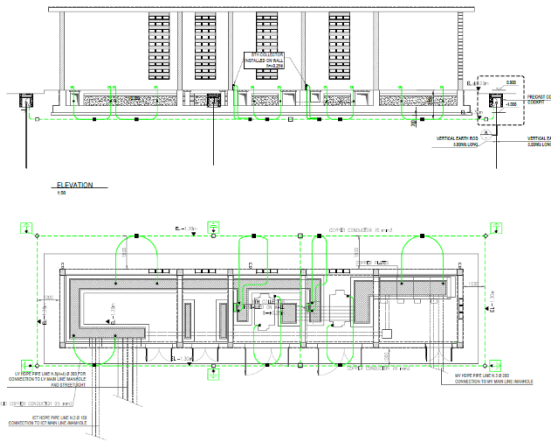


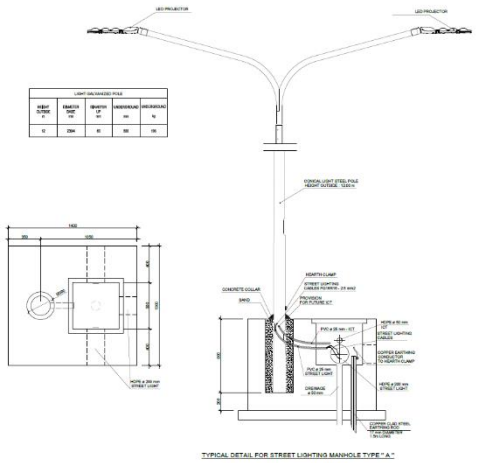
smart technology city of about 28'000 inhabitants.

The electrical design for KTC covers the entire electrical distribution services. As such, it includes:

- A main 66/11kV substation equipped with three 40MVA transformers, two in operation, one stand-by, designed for the medium voltage distribution system with capabilities to be connected to the future 132kV/66kV, 100MVA transmission station and the incoming lines from Mombasa station;
- MV distribution network comprising 9 Nos 11kV loops/rings + 1 spare, for an approx. total length of 42 Km;
- 53 Nos 11/0.4kV substations completed with two oil transformers each of different powers according to the specific area requirements (transformer size varies from 400KVA to 2000KVA);
- Civil infrastructure (i.e. ducts and manholes) to house the low voltage cables which will deliver power to each parcel from the 11/0.4kV substations;
- Street lighting for roads and boulevards (total length about 40km), which includes the systems and the related lighting equipment, inserted in the architectural context of the work;
- Utility tunnel 2.5m x 2.5m in reinforced concrete, approx. total length 6.1 Km, containing the infrastructures for medium and low voltage electricity, potable and irrigation water pipelines, data network ICT conduits, and Automatic Solid Waste Collection system (ASWC);
- Electrical distribution systems serving the Wastewater Reclamation Facility (WRF), designed as a treatment plant for a 28'000 equivalent population;
- Electrical power supply and distribution works necessary to power the wastewater Temporary Treatment Facility (TTP);
- Electrical distribution systems serving the Water Treatment Plant (WTP), which supplies water to the city through approx. 48 km of pipelines;
- Civil infrastructure (ducts) to house the fiber optic cables which will provide connectivity throughout the entire city.

Also, the Electrical Design for KTC includes the complete public lighting system for all roads, green areas, parks and large areas with high lighting intensity (such as athletic fields and city entrances).





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