



siea

**soluciones de ingeniería
energética aplicada**

We work with energy



The Company

SIEA

Soluciones de Ingeniería Energética Aplicada is a company specialized in energy projects. Among its references can be found both purely thermal projects and joint generation of thermal and electrical energy, highlighting in all of them the use of renewable energies as well as other energy sources that improve efficiency. SIEA's activity ranges from **SPECIALIZED ENERGY CONSULTANCY** to the execution of **ENERGY GENERATION PLANTS** under the "turnkey" modality.



ENERGY ENGINEERING

History More than 10 years at the service of our clients

Since its inception, **SIEA** has specialized professionals in the energy sector involved in this type of projects and facilities since the early 1990s. SIEA has executed a multitude of projects, including **COGENERATION** facilities with gas and biogas, **PHOTOVOLTAIC** plants and **BIOMASS** facilities for the generation of thermal and electrical energy.

Team

The **EXPERIENCE** in energy projects of the professionals who make up **SIEA's** technical team allows undertaking the complete and correct execution of turnkey installations, being able to meet all the needs associated with the development of projects carried out by **SIEA**, including engineering, the design, the selection of contractors and equipment, their installation, the construction management, and ending with the complete legalization of the facilities before public and private entities.

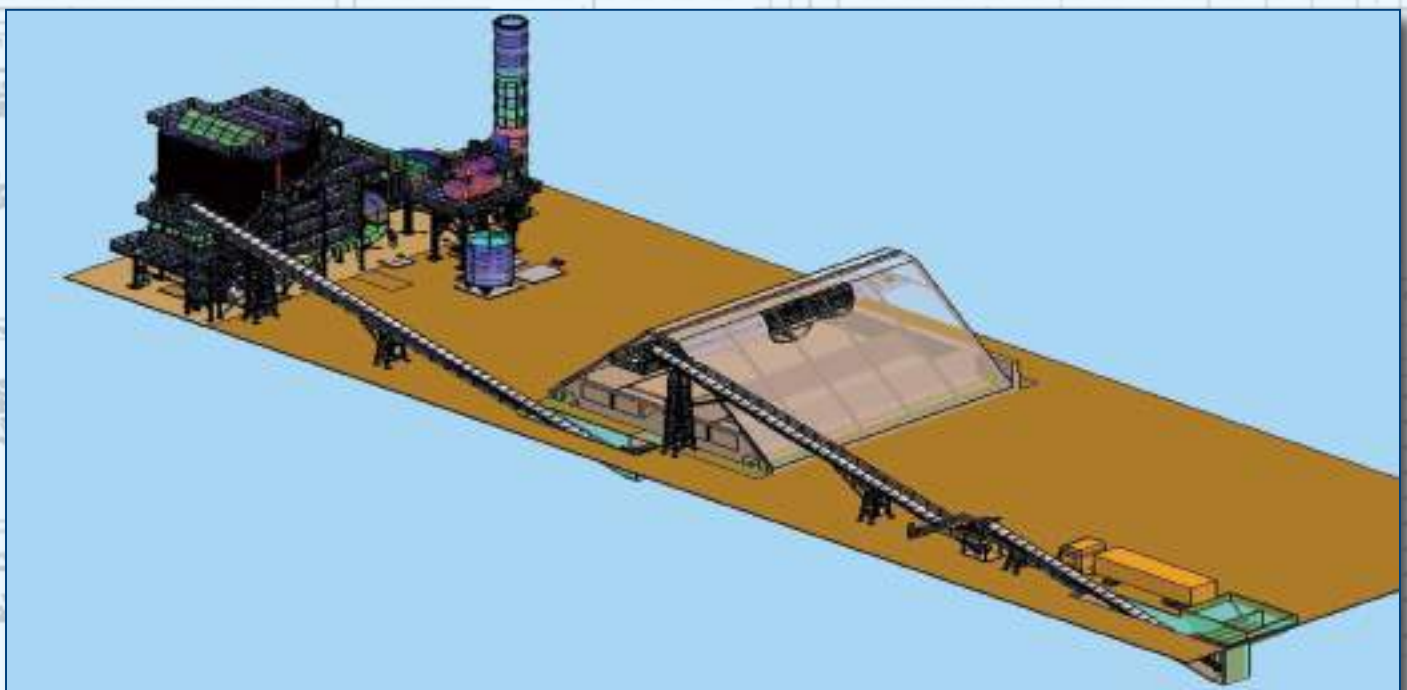


Execution of facilities

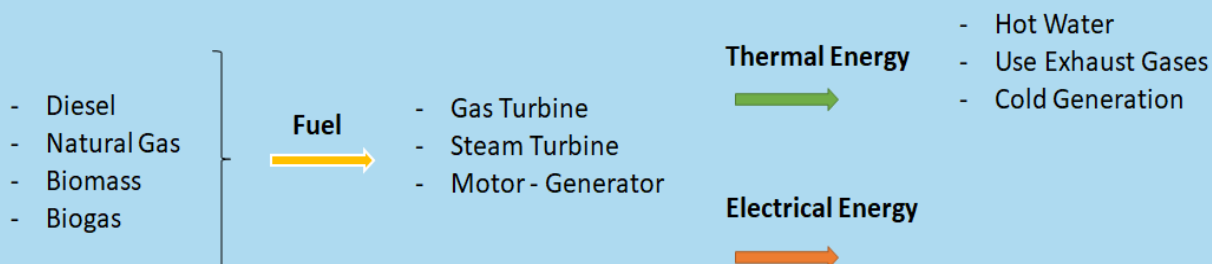
- Engineering, design, construction management and legalization of the facilities:
- COGENERATION PROJECTS.
- BIOMASS PLANTS.
- CONVENTIONAL BOILERS.
- SOLAR INSTALLATIONS.
- Equipment supply.
- "Turnkey" / EPC projects.

Consultancy

- Energy-economic feasibility studies.
- Energy advice.
- Processing of contracting supplies.
- Management of purchase and sale of electrical energy.



SIEA has vast experience in the development of this type of energy efficiency facilities where it is produced simultaneously thermal and electrical energy, prioritizing energy efficiency as well as the use of renewable energy. This type of facility, always associated to an industrial process, their potential users are sectors as various such as chemical, ceramic, wood, water purification, etc, the motor element used being also varied, making installations with diesel engines, biogas engines, natural gas engines and natural gas turbines.



Natural Gas Turbines



Features

- Ceramic industry
- 2 gas turbines of 7+5 MWe
- Interconnection point voltage 66 kV
- Direct recovery of turbine exhaust gases for ground sprayers

Features

- Ceramic industry
- 5,5 MWe gas turbine
- Interconnection point voltage 20 kV
- Direct recovery of turbine exhaust gases for ground sprayers.



Natural Gas Engines



Features

- Polystyrene packaging industry
- 1 MWe natural gas engine
- Interconnection point voltage 20 kV
- Direct recovery of engine exhaust gases to generate steam in a recovery boiler.

Features

- Food industry
- 4,4 MWe natural gas engine
- Interconnection point voltage 132 kV
- Heat recovery for hot water generation.



Biogas Engines



Features

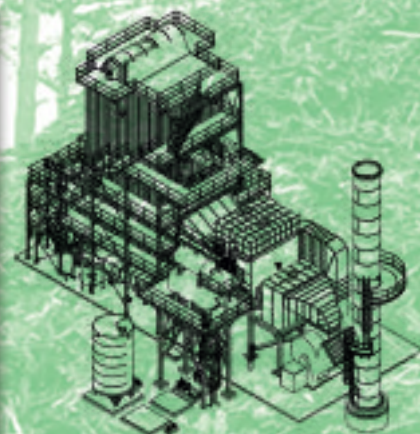
- Wastewater treatment plant
- 1 MWe biogas engine
- Interconnection point voltage 20 kV
- Heat recovery for conditioning the digester.

Features

- Paper industry
- 330 kWe biogas engine
- Interconnection point voltage 66 kV
- Heat recovery for hot water generation.



At **SIEA** we have extensive experience in projects with boilers for the use of the most varied types of biomass, having special designs of combustion systems with mobile grate and automatic ash extraction systems, perfectly adapted to its operation with high humidity, varied granulometry and high presence of ash, coupled to hot water boilers, superheated water, saturated steam, superheated steam, thermal oil or directly generating hot gases. We also have solutions for the storage and controlled dosing of fuel to the boiler.



SIEA as a supplier of BIOCAL in Europe



SIEA is the official distributor for Europe of **BIOCAL** biomass boilers and burners (Biochamm brand). In the generation of electrical energy, it has installed equipment that can add up to more than 3,000 tn / h of steam, generating 530 MWe / h, taking advantage of various types of fuels for which we have developed specific combustion systems.

BIOCAL and **SIEA** propose joint tailor-made solutions in projects aimed at making use of different types of waste.

Turnkey projects combining the water-tube boilers manufactured by Biocal with turbo-power generators, automatic feed silos, assembly ...

MGV smoke tube boiler



Features

- Water and steam production: from 3 to 25 tn / h. Steam pressure: up to 25 bar
- Mobile grill
- Automatic ash extraction
- Automatic fuel feed
- Air preheater and soot blowers

MGV smoke tube modular boiler

Features

- Steam production: from 1 to 10 tn / h and hot water up to 7,000,000 kcal / h
- Steam pressure: up to 16 bar
- Construction by modules and assembly by blocks: grill and ashtray, water tube fireplace and fire tube drum.
- Fully automated: biomass feeding, combustion, cleaning and ash extraction.
- Surveillance system every 24h / 72h according to TRD 604.



Aquatubular boilers MGV-CA

Features

- Steam production: MGV-CA from 10 tn / h to 200 tn / h
- Steam pressure: up to 100 bar
- Mobile grill and automatic feeding
- Automatic ash extraction
- MGV-BA water-tube boilers up to 400 tn / h



Biomass burners MSRB

Features

- Heat capacity: 645,000 to 65,000,000 kcal / h
- Mobile grill
- Automatic ash extraction
- Automatic fuel feed
- Internally cooled
- Some sizes are supplied fully finished



Storage silos and automatic dosing of biomass

Features

- Capacities: from 50 to 5,000 m³
- Automatic fuel extraction and transportation
- Types: moving floor silos, high capacity screw silos and vertical silos
- Other accessories: conveyor belts, redlers, screens, overbands ...



CONVENTIONAL BOILERS

Features

- Production: up to 20 tn / h
- Pressure: up to 16 bar
- Fuels: gas, diesel, biogas ...
- Fluids: water, steam and thermal oil
- Home with three smoke passages
- Fully water-cooled chamber
- Design that favors increased performance and reduces maintenance cost



SIEA uses the latest technologies and trends in the field of renewable energies, also designing and executing solar power plants, both thermal and photovoltaic.



Features

- Coreses (Zamora)
- Nominal power 3.7 MWe
- Fixed system on ground
- Estimated annual production = 4.6 GWh

Features

- Villalazán (Zamora)
- Nominal power 1.1 MWe
- Fixed system on ground
- Estimated annual production = 1.4 GWhh



Features

- Onda (Castellón)
- Rated power 1.5 MWe
- Fixed system on the ground, with manually adjustable inclination
- Estimated annual production = 2.2 GWh

Features

- Yémeda (Cuenca)
- Nominal power 1 MWe
- Fixed system on ground
- Approximate annual production = 1.4 GWhh



Our collaborators

For some years SIEA's scope of action it has spread beyond our borders. Collaboration with its partners has allowed SIEA to be immersed in international projects, highlighting its presence in countries such as Portugal, Brazil and, more recently, in Mexico.



Clients

The best references for SIEA are those that its customers can provide both in the cogeneration sector, with more than 60 references, as well as in the generation of electrical energy from biomass, the use of this for thermal use or the generation of electrical energy in photovoltaic installations.



SIEA's technical team has executed more than 60 electric power generation cogeneration facilities, some of which are listed below:

COGENERATION PROJECTS

PAPELERA SAN LUIS	Paper industry	Natural gas engine	1 x 1.979 kWe	San Luis de Potosí (México)
GIVAUDAN	Chemical Industry	Natural gas engine	1 x 2.657 kWe	Querétaro (México)
RONAL	Automotive Industry	Motor de gas natural	5.937 kWe (3 x 1.979 kWe)	San Luis Potosí (México)
ATOMIZADAS DE ALCORA	Clay spraying	Natural gas turbine	12.069 kWe (1 x 6.908 kWe + 1 x 5.161 kWe)	Alcora (Castellón, Spain)
ATOMIZADORA S.A.	Clay spraying	Natural gas turbine	1 x 5.505 kWe	Onda (Castellón, Spain)
ATOMIX	Clay spraying	Turbina gas natural	2 x 5.000 kWe	Onda (Castellón, Spain)
ROQUETTE-LAISA ESPAÑA	Feeding	Natural gas engine	1 x 4.400 kWe	Benifaió (Valencia, Spain)
ENDESA (AIADHESA)	Feeding	Natural gas engine	1 x 1.000 kWe	San Vicente del Raspeig (Alicante, Spain)
CERÁMICA NULENSE	Ceramic	Natural gas turbine	1 x 6.850 kWe	Nules (Castellón, Spain)
EDAR PINEDO	Water depuration	Biogas engine	2 x 1.015 kWe	Pinedo (Valencia, Spain)

Several of our references in the photovoltaic sector are the following:

PHOTOVOLTAIC INSTALLATIONS

PHOTOVOLTAIC SOLAR INSTALLATION CONNECTED TO A 3.7 MWe NETWORK	IRSOL	Energy	Coreses (Spain)
PHOTOVOLTAIC SOLAR INSTALLATION CONNECTED TO A 1.1 MWe NETWORK	IRSOL	Energy	Villalazán (Spain)
PHOTOVOLTAIC SOLAR INSTALLATION CONNECTED TO A 1.5 MWe NETWORK	ESA	Energy	Onda (Spain)
PHOTOVOLTAIC SOLAR INSTALLATION CONNECTED TO A 1 MWe NETWORK	PISCIFACTORÍA YÉMEDA	Feeding	Yémeda (Spain)

Some of the **BIOCAL** biomass burner and boiler installations carried out by **SIEA** in Spain and Portugal are the following:

BIOMASS FACILITIES

AQUOTUBULAR BIOMASS BOILER OF 10,700 KG / H OF STEAM AT 40 BAR FOR PRODUCTION OF 2 MWe	DALKIA, S.A.	Energy	Barcelona (Spain)
BIOMASS AQUOTUBULAR BOILER OF 11,000 KG / H OF STEAM AT 42 BAR FOR PRODUCTION OF 2 MWe	IBERDROLA, S.A.	Energy	Corduente (Spain)
BIOMASS AQUOTUBULAR BOILER OF 21,000 KG / H OF STEAM AT 64 BAR FOR PRODUCTION OF 4.5 MWe	IBERFER-PALSER	Timber	Tondela (Portugal)
AQUOTUBULAR BIOMASS BOILER OF 10,500 KG / H OF STEAM AT 42 BAR FOR PRODUCTION OF 2 MWe	NUFRI	Horticulture sector	Mollerussa (Spain)
6.96 MW BIOMASS BURNER FOR DRYING IN PELLET PLANT	HIJOS DE TOMÁS MARTÍN, S.L.	Timber	Doña Santos (Spain)
AQUO-PIROTUBULAR BIOMASS BOILER OF 6,000 KG / H OF STEAM AT 16 BAR FOR STEAM PRODUCTION	CARTONAJES BERNABÉU, S.A.	Cartons	L'Olleria (Spain)



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