

# GEOGREEN

Geogreen is a group operating in the Energy industry, capable of providing an integrated system of products and services, fully respecting the environment.

## NATURE'S ENERGY AT YOUR SERVICE

Geogreen is a RadiciGroup partner in supplying the energy needed for its *Specialty Chemicals, High Performance Polymers, Synthetic Fibers & NonWovens* business areas.

# HYDROELECTRIC

Geogreen has six hydroelectric power plants in Lombardy and Piedmont.

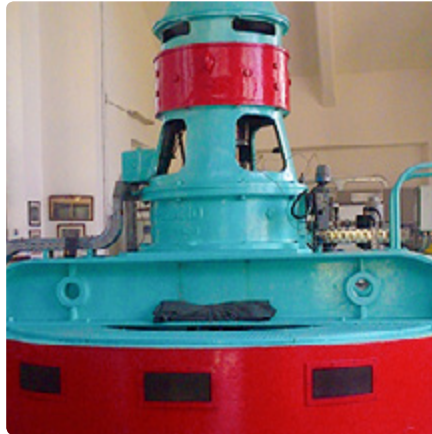
The average annual production is approximately 60 million kWh, with an overall electricity generating capacity of 12 MW.



**COLDIMOSSO POWER PLANT**  
TURIN

Located in Susa (Turin), this is an interesting example of industrial archaeology dating back to the beginning of the 20th century which makes use of water from the Dora Riparia River.

Following the revamping done in 2007, the two production groups, with two horizontal axis Francis turbines have an overall power of 3,200 kW and an average production of 16 million kWh per year.



**CAMPIGNANO POWER PLANT**  
BERGAMO

Located in Parre (Bergamo), it uses water from the Serio River in Villa d'Ogna (Bergamo) and dates back to the 1940s.

The hydroelectric unit is made up of a vertical axis Kaplan turbine with installed power of 1,560 kW and an average production of 8 million kWh per year.



**CAMPIGNANO MVF POWER PLANT**  
BERGAMO

Located in Fontanino, in the municipality of Piario (Bergamo), it was finished in 2017 and uses the minimum vital flow of the Campignano hydroelectric power plant.

The hydroelectric unit is made up of a vertical axis, double-regulated Kaplan turbine with installed power of 50 kW and an average production of 350,000 kWh per year.



**CUNELLA POWER PLANT**  
BERGAMO

Located in Villa d'Ogna (Bergamo), it uses water from the Serio River in Ardesio (Bergamo) and dates back to 1960.

The hydroelectric unit is made up of a horizontal axis Francis turbine with installed power of 1,380 kW and an average production of 7.5 million kWh per year.



**LENNA POWER PLANT**  
BERGAMO

Located in Lenna (Bergamo), it was built in 1937 and renovated in 1998. It uses water from the Brembo River in the municipality of Olmo al Brembo (Bergamo).

Following revamping in 2006, the hydroelectric unit is made up of two vertical axis Francis turbines with a total installed power of 3,600 kW and an average production of 18 million kWh per year.



**MOLINO NUOVO POWER PLANT**  
PAVIA

Located in Ferrera Erbognone (Pavia), the power plant was completed in November 2010 and uses water from the Agogna Stream.

The hydroelectric unit is made up of two S-type Kaplan turbines with installed power of 1,560 kW and an average production of 6.5 million kWh per year.

## THE COMPANY

**Geogreen**, an Italian Group founded in 2000 as a single energy supplier for RadiciGroup, with its companies **GeoEnergie SpA** and **Geogreen SpA**, is now one of the most qualified suppliers of an integrated system of products and services: from **Electricity and Natural Gas supply** to the **production of Hydroelectric and Thermoelectric Energy from Cogeneration**, to the development of projects and specific activities in the Renewable Energy sector.

It is also able to offer consulting services such as the management and promotion of initiatives for energy savings; **management of CO2 emissions trading; trading of energy efficiency credits (white certificates) and Guarantees of Origin for Plants supplied with Renewable Energy Sources (GO)**, and related management of needs; as well as the identification of the best electricity and gas supply proposals.

The group also operates on the **Italian Power Exchange** and in electricity and natural gas trading and sales.

Plus, **Geogreen** is able to promptly notify companies of the latest updates to legislation, evaluate savings opportunities, optimise operation of plants from the economic and environmental point of view, and analyse the feasibility of new production plants or the improvement of existing ones.

**Geogreen** is a single partner, able to meet the needs of its client companies, in harmony with the evolution of the industrial world.

A player able to offer a complete range of services, with the best cost to quality ratio and **fully respecting the environment**. A solid, agile, and flexible group, focused on continual improvement and perfecting its products and services.

## COGENERATION

The **Geogreen** production facilities also include the **Novel cogeneration power plant (with 49% ownership; the remaining 51% belongs to the Alpiq Group)**.



### NOVEL POWER PLANT NOVARA

The power plant, built in 2004 and located in Novara, is certified as a High-Efficiency Cogeneration (HEC) plant according to the highest energy efficiency standards.

Supplied with natural gas, it is made up of a plant for the combined production of electricity and steam (cogeneration) based on the modern turbogas-turbosteam combined cycle technology. It has an electrical power of 105 MW (71 MW Turbogas and 34 MW Turbosteam) and is capable of producing approximately 700 GWh/year of electricity.

Of this, about 80 GWh/year is transferred to Radici Chimica SpA, a Radici-Group company.

The remaining power is inserted in the national grid to be sold in the Energy Exchange or used by other RadiciGroup facilities and Geoenergie customers.

The over 600,000 tons of steam produced per year is transferred, in its entirety, to Radici Chimica SpA, to be used in the production cycle.

In this manner, Radici Chimica SpA reduces emissions by approximately 35%, thanks to the advantages of cogeneration, which are combined with the use of advanced technology and the reduced environmental impact of natural gas.

## ELECTRICITY

The energy produced comes from hydroelectric power plants and cogeneration combined-cycle turbogas/steam thermoelectric power plants.

Through **GeoEnergie SpA**, **Geogreen** is active as a wholesaler on the Italian electricity market, taking care of **trading and sales of electricity for businesses**.

It is also operational in the Italian Power Exchange. Special relationships with major European producers and traders allow us to offer competitive prices.

Thanks to the procurement portfolio from **hydroelectric plants (small hydro)** owned by **Geogreen SpA**, **GeoEnergie SpA** makes it possible for its clientele to certify that the energy consumed is from a renewable source. This certification calls for the cancellation of a number of **GO (Guarantees of Origin for Plants supplied with Renewable Energy Sources)** equal to the amount of electricity provided to be certified through the process managed by GSE (*Gestore dei Servizi Energetici* or Energy Services Manager).

A particularly significant example of this is represented by the certified hydroelectric energy supply to the RadiciGroup production plants.

This attention to renewable sources can also be seen in the composition of the energy mix used for the production of electricity sold by **GeoEnergie SpA**.

Finally, the experience acquired in the industry and the willingness to continue along the path of using energy from renewable sources is further shown in the development of new activities in the Renewable Energy sector.

## GAS

**GeoEnergie SpA** is a wholesaler in the Italian natural gas market. As a company authorised to sell to end customers, it is involved in the **procurement, trading, and marketing of natural gas to industrial customers**.

Through the ownership of transport capacity on pipelines that import gas into Italy and special relationships with major Italian and European traders, it is also able to purchase gas abroad and offer its customers competitive prices.

## SERVICES

**Geogreen** offers companies more than just electricity and gas. Through **GeoEnergie SpA**, it offers information and consulting services:

- promptly notifying companies of the latest updates in industry legislation;
- analysing the feasibility of new production plants or improvements of existing ones;
- optimising the operation of plants from the economic and environmental point of view;
- identifying the best electricity and gas supply proposals, evaluating saving opportunities;
- promoting initiatives aimed at energy savings;
- managing the needs and trading of Energy Efficiency Credits (White Certificates) and Guarantees of Origin for Plants supplied with Renewable Energy Sources (GO);
- supporting and coordinating the relationships of its electricity producing customers with the organisations involved in managing the plants they own;
- supervising the activities for obtaining incentives from renewable sources and the correct supply by GSE (*Gestore dei Servizi Energetici* or Energy Services Manager);
- coordinating "Emissions Trading" activities, the CO2 emission allowances exchange system.

## GEOGREEN ALSO OFFERS...

**Geogreen SpA** is directly involved in managing hydroelectric power plants owned by its customer companies, offering its know-how and a series of services:

- **production monitoring;**
- **routine maintenance;**
- prompt restarts in the event of a shutdown due to failure or protective measures;
- internal and external cleaning of machinery;
- repairs to hydraulic machinery (turbines, separators, etc.) and electrical systems;
- software modifications;
- search for improvement solutions and production **optimisation**.

**Geogreen SpA** makes its experience in the creation and management of "**cogeneration**" plants available to its customers.



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