



# SMIGROUP

## SMI GROUP'S NEW HEADQUARTERS

**O**ur redevelopment project of the former paper mills, which started in late 2011, involved the full reorganization of the old factories and the office buildings, with a focus on sustainable development.

The renovation project was based on a careful study of environmental issues and impact on the territory, which focused on the "Architecture and Environment" combination, which led to the adoption of a set of innovative solutions to minimize energy consumption as well as the environmental impact of SMI's new industrial complex.

The new assembly plants are equipped with a photovoltaic roofing,



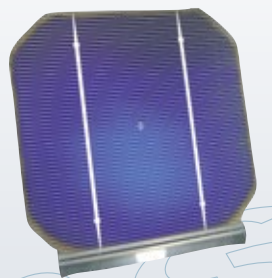
capable of producing electricity for 726 MWh/year, allowing us to reduce CO2 emissions in the surrounding environment by about 320 tons per year.

Among the high energy efficiency facilities installed in the new headquarters, there is also a solar thermal system for heating the water used in the company service areas (bathrooms, gardens, etc.).

There is even a hydroelectric power plant inside the building, operated by

the SMI ENERGY company, which has a top production output of 6 GWh/year of "clean energy" derived from the Brembo River that flows nearby.

The power plant was boosted through the installation of a new Kaplan turbine, which exploits the water's descending leaps and pressure.



**S**MI annually invests a large portion of revenues from sales and services in Research & Development projects, creating innovative projects characterized by the use of advanced technologies, energy savings and respect for the environment, which cater both to the product range and the workplace in which this range is designed and built. The redevelopment project of the industrial location, which had hosted the Cima Paper Mills in San Giovanni Bianco from 1907 to 2004, stemmed

from SMI's aforesaid continuous commitment to innovation. This location recently became the new headquarters of the SMI Group. The strong link with the territory of the Valle Brembana (the Brembana Valley) is one of SMI's hallmarks. In over 25 years of business, SMI has made a number of substantial investments, locally, among which the acquisition of the former Cima Paper Mills in 2004 stands out, the paper production and marketing business of which definitely ceased in 2009. The entire industrial

area of about 30,000 m<sup>2</sup> is part of the architectural heritage of this location and is one of the most significant aspects of the strong economic development experienced in the Brembana Valley in the late nineteenth and early twentieth centuries; hence our idea of renovating this location through the major restructuring and modernization of all the factories and buildings that had been part of it, preserving its historic facilities and improving the huge indoor and outdoor spaces.

# THE IMPORTANCE OF THE ARCHITECTURE AND ENVIRONMENT COMBINATION

**R**efurbishments were carried out in steps, to allow for the gradual transfer of the business from the old location to the new one. SMI started moving its offices and production departments in the second half of 2013 and ended in June 2014.

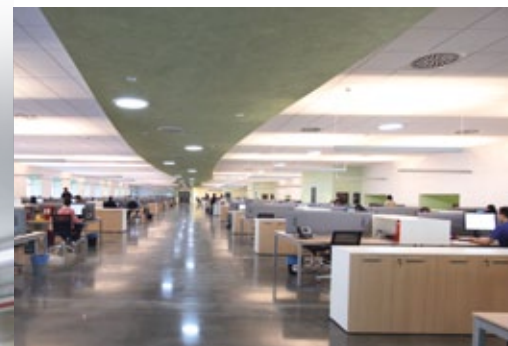


In the summertime, air is conditioned through the use of heat pumps that have replaced the conventional electrical conditioners, whereas latest generation heat generators were installed for winter heating, featuring high efficiency and performance.

In order to avoid losses of hot and cold air from the offices and production departments, an innovative centralized cooling system was implemented, which intakes outdoor air, filters it and then circulates it indoors.

SMI Group's new headquarters also feature a number of innovative solutions to achieve maximum energy saving:

- the new floor heating system in buildings, which uses low-temperature water from a condensation boiler (the energy efficiency of this type of boiler is higher than that of normal heat generators);



## INNOVATIVE TECHNOLOGIES TO PROTECT THE ENVIRONMENT AND SAVE ENERGY

The technological innovations introduced in the SMI Group's new headquarters reaffirm the company's awareness to the issues of renewable energies, which are inexhaustible and have no environmental impact since they do not produce greenhouse gases or harmful pollutants to be disposed of.



In fact, the industry keeps looking to the green economy with increasing interest at global level, due to the significant advantages it offers in terms of low cost energy supply and environmentally sustainable growth of production activities.

Another green aspect of SMI's new production unit is represented by the indoor and outdoor lighting system.

Room lighting was exploited where possible, thanks to the installation of large windows, but the lighting systems were made using LED lights, a low-energy consumption solution which, being directly managed by a centralized supervision system, gradually and fully automatically self-regulates the lights, according to the intensity of the natural light.

An inverter-based technology was applied to the production system's utilities (such as compressed air, for example), which allows the use of reduced power consumption systems.

The innovations adopted also provide a series of measures to reduce the costs of waste management; an example is the installation of a PET shredder inside the machine testing department, which allows us to dispose of the plastic packaging material used in the in-house testing of SMI-produced machines.

Thanks to this technology, PET waste to be disposed of has been completely eliminated because PET is first treated and then shredded, thus becoming the raw material to be sold to the moulding industry and to produce the preforms.

- building insulation, which reduces heat loss from the building's shell and acts on floors and false ceilings, with the consequent reduction of the primary energy needed to heat the rooms;
- complete renovation of the lighting systems, with the introduction of an advanced home automation control system that allows you to turn on all or just a few lights, depending on the number of people present in a certain room and the amount of natural light coming through the windows and the solar tubes installed.

Thanks to such energy-saving works and to Sansaving company's consultancy, the GME ("Gestore dei Mercati Energetici", i.e. the Italian authority managing the electricity market) has granted SMI a certain number of "Energy Efficiency Certificates" and a precise reckoning of savings deriving from those works. These Titles, also known as "White Tags", are a public incentive, paid in the form of financial contributions to



companies which undertake energy efficiency measures to reduce fuel consumption and achieve the best use of available resources; they are used in the United States and in many EU countries, where they are known as "Energy Savings Certificate (ESC)", "Energy Efficiency Credit (EEC)" or simply "white tags".

The implementation of the foregoing eco-friendly solutions will allow SMI to obtain energy savings, on a yearly basis, in the consumption of natural gas estimated at about 24,500 €, 70,000 scm (standard cubic meters) or 57 TOE (Tons of Oil Equivalent) and gain 167 EEC (Energy Efficiency Credits).

## SMI's new facility, between history and modernity



The synergy created between the initiative of some "foreign" entrepreneurs and the courage of local communities enabled acquiring, interpreting and implementing the ideas brought on by the new times, making it possible to launch major industrial initiatives in the towns of the Brembana Valley. This was the context in which the Cima Paper Mills of San Giovanni Bianco were founded in 1907. Today, 114 years later, this industrial area shines once again and people are talking about it thanks to a combination of solutions of great architectural value, carried out in full respect of the environment and according to sustainable development dictates. The recovery of the hydroelectric power plant deserves recognition among the most significant interventions. This plant was used by the old paper mills and produced current from the water leap of the Brembo River, from which the valley takes its name. Thanks to the installation of a new Kaplan turbine, SMI has given new life and "energy" to one of the oldest power plants of the Brembana Valley, preserving the original structure and modernizing its plants and premises.

When SMI decided to take over the former production site of the Cima Paper Mills in 2004, it started the actual process of renovating an industrial center that had made the history of the Brembana Valley and which had determined its economic and social development in the two decades between 1895 and 1915 (one of the most important in the history of this territory). The arrival of the railroad in 1906, hydroelectric and industrial development, the boom of spas and elite tourism in the town of San Pellegrino Terme, as well as the emergence of a new social consciousness, marked a period of transition in actual fact, allowing the Brembana Valley to come out of the deep backwardness and geographic isolation besetting the nineteenth century.



# RENEWABLE

## ENERGY PRODUCED BY SMIGROUP FROM THE WATERS OF THE BREMBO RIVER

The hydroelectric power plant managed by SMI ENERGIA converts into electrical energy the hydraulic energy of the Brembo River watercourse and consists of a series of hydraulic engineering works, positioned in a certain sequence and coupled to a series of machines suitable for producing electrical energy from masses of moving water. The produced energy is the renewable type since the water can be reused unlimited numbers of times for the same purpose without the need for a purification process.

The power plant includes the damming of the river and a dam, which intercepts the watercourse and creates a reservoir where the water level is kept constant. There is a "grid cleaner" at dam entrance, which is an electromechanical device designed to remove waste from the river, thus ensuring proper water cleaning. Waste removed from the grid is conveyed on a conveyor belt to a special area where it is disposed of. Water is conveyed to loading tanks and then reaches the turbines,



through penstocks, which rotate by means of the water's thrust. There are several sluices along the canal that eliminate any excess water and stabilize its volume so as to supply the power plant with the max admissible range of flow. The Kaplan turbine, developed in 1913 by the Austrian professor Viktor Kaplan, is an inward flow reaction turbine that exploits small differences in level up to even a few dozen meters, but with high flow rates. Constructively speaking, it is a propeller-type water turbine which has adjustable blades that, when the water flow changes, allow achieving and maintaining efficiency over a wide range of flow up to 20-30% of the nominal flow rate.



The water reaches the turbine through a scroll-shaped tube that wraps around the turbine's wicket gate and is then directed tangentially through the wicket gate and spirals on to a propeller shaped runner, causing it to spin. The turbines' speed is generated by a difference in height of the water flow, called "leap", which translates into hydrodynamic pressure at the lower level where the Kaplan turbine is located. An alternator is directly connected to the turbine; the former is an electrical rotary device that transforms the mechanical energy transmitted from the turbine into electrical energy. The hydroelectric power plant installed in SMI Group's new industrial

site has a maximum production capacity of 6 GWh per year; all the information related to daily output, max output, etc., is displayed on the touch-screen of a computer located in the power plant's premises which allows controlling it "remotely", i.e. unmanned.

