



SUSTAINABILITY

The green soul of L'italiana Aromi

Because growth and innovation originate also from environmental sustainability and energy saving.



Since 1890 L'italiana Aromi has been specialising in the manufacture of a wide range of flavours, extracts and distillates for the food and pharmaceutical industry. It collaborates with numerous leading companies in the food sector, supplying them with flavours, natural flavours, extracts, infusions, distillates, essential oils and fruit-based compounds.

In 2006, L'italiana Aromi chooses to limit the environmental impact of her manufacturing processes thanks to a streamlined energy saving system. Not only that, the green soul of L'italiana Aromi is much more than a marketing strategy. This is proved by the Lombard company's last 10 years of activity.

Green was the choice to acquire an **old factory** without knocking it down to then rebuild it, restoring it primarily by means of an indispensable decontamination from asbestos. *Green* was the choice to **enhance the industrial archeology** of the territory and to make the same building the **energetic heart of L'italiana Aromi**, installing photovoltaic panels on the roof and cogeneration and geothermal plants in the inside. *Green* was the decision to **keep** the areas around the buildings **green** by planting new trees. *Green* is the conviction that complying with European standards in the field of environmental policies is important and necessary for a company of great experience which, thanks to its potential, aspires to becoming increasingly **international**.



To meet the high energy requirement of its own production site and, at the same time, impart a concrete change, starting from the year 2006 the Lombard company decided to undertake an important re-conversion process towards a sustainable future. With almost six years of work and an investment of several million Euros, an organic and functional system has been accomplished which is able to bring the company up to European standards for energy saving and sustainable development. **It is a radical re-thinking of the development model aiming at greater environmental sustainability and growing innovation, which catapults L'italiana Aromi among those companies, not only Italian but also international, which are more responsible and attentive towards the environment.** And the route taken by the company, to demonstrate its European and international outlook, represents the future of the whole industrial sector: this is confirmed by the GreenItaly study carried out by Unioncamere (an Italian public entity, representing and caring for the general interests of the Italian Chambers of Commerce), according to which 37.4% of *green* enter-

prises can boast an important presence on overseas markets, compared to 22.2% of companies that do not invest in the environment.

For L'italiana Aromi focusing on ecology and energy saving means:

- **PHOTOVOLTAIC SYSTEM** for the production of electric energy
- **GEOHERMAL SYSTEM** for the supply of refrigerated water and for heating
- **CO-GENERATION SYSTEM** for energy management
- **ABSORPTION REFRIGERATION SYSTEM** for refrigeration units

PHOTOVOLTAIC



The system consists of 2,412 panels and is installed covering four of the five plants which make up the production site of L'italiana Aromi. With a production capacity of 403,24 kWp, it will provide 437.392 kWh/year of electric energy.

The combination of the dimensional features and performance of the modules with the adaptability of the fixing systems has allowed optimisation of the ratio between installed power and space available. The whole electric plant has been suitably assessed to obtain a **coefficient of efficiency of the system which is significantly higher than the minimum required by law.**



This system, designed in such a way that any excess energy is fed back into the main electric network, allows significant coverage of the company's electric energy requirements with a consequent and important cutting of energy costs.

PHOTOVOLTAIC

- Saving of tons of oil equivalent to 96.22 TOE/year
- Avoided emission into the atmosphere of CO² equal to 294,802 kg/year
- Avoided emission into the atmosphere of NO_x equal to 218.70 kg/year
- Avoided emission into the atmosphere of SO² equal to 437.39 kg/year

GEOHERMAL

Geothermal energy embodies a very simple concept: **use of the existing energy in the ground, without having to produce any more.** In particular, having analysed the context in which the production plants of L'italiana Aromi are located, the water from a water table just a few dozen metres away from the factory has been retrieved. The water has a temperature which is always constant and it can be used to provide the company with both hot and cold water. By means of a split unit with heat pump, which heats or cools the water, **all the industrial processes of L'italiana Aromi are supplied**, in addition to the air-conditioning and heating of the rooms and bathrooms. To best meet the needs of the company, the split unit has been specifically designed to produce thermal energy in the form of hot water at a temperature of 50/55°C and, at the same time, refrigeration energy in the form of refrigerated water at a temperature of 4/7°C. At the end of the process, the water from the water table is fed back into the water table through a return well at

a temperature ranging from $\pm 3/4$ °C than the temperature of the incoming water. In addition to a significant reduction in energy costs, the plant allows a **significant improvement from an environmental point of view, given the avoided emissions of greenhouse gases.**

GEOTHERMAL

- Production of thermal energy (water at a temperature of 50°C)
- Production of refrigeration energy (water at a temperature of 7°C)
- Only production of refrigerated water:
 - absorbed electric power 146 kW
 - refrigeration power yield 627 kW
- Only production of hot water:
 - absorbed electric power 201 kW
 - refrigeration power yield 639 kW
- Simultaneous production, hot and refrigerated water:
 - absorbed electric power 206 kW
 - refrigeration power yield 487 kW
 - thermal power yield 693 kW

COGENERATION

L'italiana Aromi's cogenerative system, for the combined production of electric energy and integrated heat, is made up of an endothermal engine fuelled with methane gas coming from the town mains system in Carate Brianza. The engine which makes use of both the exhaust fumes and the cooling heat of the engine block, guarantees the production of electric energy which is passed into the network.

COGENERATION

- Electric power 240 kW
- Useful thermal power 366 kW
- Primary thermal power (from methane gas) 669 kW
- Methane gas consumption 69,76 Nm³/h
- Electric efficiency 35,8 %
- Thermal efficiency 54,7 %
- Overall efficiency 90,5 %

The thermal power of 366 kW can therefore be guided to the following circuits, listed in order of precedence:

- refrigerated water circuit (absorber)
- district heating water circuit
- hot water circuit tanks

ABSORPTIVE REFRIGERATION

Unlike conventional industrial refrigerators, the cooling unit at L'italiana Aromi works by absorption, i.e. **it does not use electric energy, but heat.** Fed with hot water and working with a water-lithium bromide solution, the cooling unit used at L'italiana Aromi, therefore, does not have a compressor, but is equipped with an internal system composed of absorber, heat exchanger and generator. In this way the thermal en-

ergy that is produced by the cogenerator is used also for the production of refrigeration energy, avoiding the consumption of additional electric energy.

ABSORPTIVE REFRIGERATION

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|---|-----------------|
| • Refrigeration unit model | LWM-W008 |
| • Type of single-stage refrigeration unit | using hot water |
| • Refrigerating power yield | 255 kW |

COOLING WITH GROUND WATER

Using ground water directly, the consumption of electric energy is avoided for the production of refrigerated water with the aid of conventional refrigeration units.

The air treatment unit for the air-conditioning of the building used for industrial production has two batteries fed with ground water, which act as a support to two batteries fed with refrigerated water, coming from the plant with heat pump and trigeneration. These batteries allow a partial or total cooling – depending on the temperature of the air outside – using ground water at 12°C, with no expenditure of energy apart from that used by the pumps which allow circulation to take place.

COOLING WITH GROUND WATER

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|---|-------------------------|
| • Production of refrigeration energy, water at 12°C | |
| • Airflow treated | 43350 m ³ /h |
| • Refrigeration power yield | 102 kW |

100% AUTOMATED PROCESS

The method of management used for the production processes, the supply and transfer of energy is also cutting-edge. The system is, in fact, totally automated and can be configured according to the different needs of L'italiana Aromi.

The efficiency of the energy-saving system is driven by a single PLC, a single industrial computer installed in the control panel of the thermal/electric power plant which controls all plant machinery. It deals with optimising the thermal energy produced by the co-generator, storing the process data and displaying alarms should there be any anomalies in the system. From his own computer, then, every inspector can configure the system according to company needs, selecting the production of hot or cold water.

MINIMUM BENEFITS OF THE GEOTHERMAL SYSTEM COMBINED WITH THE COGENERATIVE SYSTEM

- Reduction in the energy bills by **35 %**
- Saving of tons of oil equivalent to **173.62 TOE/year**
- Avoided emission into the atmosphere of CO² equal to **721.20 tons/year**
- Avoided emission into the atmosphere of NO_x equal to **630 kg/year**
- Avoided emission into the atmosphere of SO² equal to **1,150 kg/year**