

# PETTINAROLI

"THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT"

**SUSTAINABILITY** manifesto

# SUSTAINABILITY MANIFESTO

2022 - v.1.2

##

##

# FOREWORD

## SUSTAINABILITY: A FAMILY VALUE

Throughout its more than eighty-year history, Pettinaroli has always been focused on developing a virtuous business capable of sustaining itself while generating a positive impact on the local area and community.



**There is a lot of talk about sustainable companies. But first of all, it should be clarified what is meant when speaking of sustainability.**

Sustainability is based on three main factors: the environmental, the social, and the economic/financial dimension.

For some years already in the company we have been committed to thinking about how to reduce the impact of our production processes on the environment. Moreover, over the time we have also developed our business by making it more and more “people-friendly” and integrated with the community of which we are a part of.

To do so, we have therefore included the “sustainability factor” in any of our business and marketing strategies by adopting suitable behaviors. Such behaviors are also certified by the prestigious ECOVADIS.

This sustainability rating, is based on four macro-parameters: environment, labor and human rights, ethics and sustainable purchasing.

The current Silver rating sees us way above the industry average, but it is just a trigger for continuous improvement. It is a philosophy of growth where family values are intertwined with those of the company. This progression, certainly, has not stopped even when facing the pandemic-related crisis, which has indeed further emphasized the importance of making every business sustainable to ensure a future for society and the planet.

In this scenario everyone is called upon to play their part, and Pettinaroli has eagerly taken up yet this new challenge!

*The Pettinaroli Family*



THE SOURCE OF INSPIRATION BEHIND  
OUR SUSTAINABILITY MANIFESTO

# UNITED NATIONS 2030 AGENDA

# 17 SUSTAINABLE DEVELOPMENT GOALS

The 17 Sustainable Development Goals (SDGs) and their related 169 subgoals form the vital core of the UN 2030 Agenda, which takes into account the three dimensions of sustainable development: economic, social, and ecological.

The SDGs must be achieved by 2030 globally by all UN member countries.

This means that every country on the planet is asked to make its contribution to addressing these great common challenges.



# SUSTAINABLE DEVELOPMENT GOALS

<b>1</b> NO POVERTY 	<b>2</b> ZERO HUNGER 	<b>3</b> GOOD HEALTH AND WELL-BEING 	<b>4</b> QUALITY EDUCATION 	<b>5</b> GENDER EQUALITY 	<b>6</b> CLEAN WATER AND SANITATION 
<b>7</b> AFFORDABLE AND CLEAN ENERGY 	<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	<b>10</b> REDUCED INEQUALITIES 	<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION 
<b>13</b> CLIMATE ACTION 	<b>14</b> LIFE BELOW WATER 	<b>15</b> LIFE ON LAND 	<b>16</b> PEACE, JUSTICE AND STRONG INSTITUTIONS 	<b>17</b> PARTNERSHIPS FOR THE GOALS 	 <b>SUSTAINABLE DEVELOPMENT GOALS</b>

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Pursuing a business model that respects the society and the environment may seem like the most onerous and complex choice, but it is also the only way to safeguard the world of tomorrow.



THE FIRST  
SUSTAINABILITY REPORT  
MADE IN PETTINAROLI

##

# INTRODUCTION TO THE MANIFESTO



## THE VALUE OF A CHOICE

**WHERE DOES THE NEED FOR A DOCUMENT SUMMARIZING ALL THE ACTIVITIES THAT MAKE PETTINAROLI A SUSTAINABLE COMPANY COMES FROM?**

Sustainability is one of the “trend topics” of recent years. But like all highly contemporary topics, the concept at its root risks becoming misused. This report aims to demonstrate how at Pettinaroli, the attention to sustainability was a priority long before it became a widely shared trending subject.

Choosing to write a report on all the activities that make Pettinaroli a sustainable company was both a challenging and stimulating exercise. Challenging, certainly not because of a lack of topics, but rather for the will to convey in every line the commitment that the company places in making the footprint of its activities increasingly intangible. Stimulating because, scrolling through the list of social and ecological initiatives that we have been carrying out for years, many of which have been going on for over a decade, we realized that the elements for the realization of a meaningful report were really all there, even too many for a single document. Around here, ethics has always been a shared value rather than a simple statement. Therefore, “operate while

protecting the environment that surrounds us” has become an increasingly relevant expression that best represents a concept that we deeply feel is ours. We think that there is no entrepreneurial success without respect for one’s own land and roots. We believe that there is no valuable business that can ignore the safeguard of the environment and the community in which it takes place. For all these reasons, we are convinced that showing you in deeds what we have often told you just with words would not have been a mere exercise of vanity. In fact, this manifesto was developed with a precise intent: to give value to a choice, your choice, the responsible and sustainable choice that you make every time you decide to buy a Pettinaroli product.





PETT





“

*The success of any company is inextricably linked to the professional and human qualities of the people that work there. That's why at Pettinaroli care for human resources has always been given central importance in any activity's management.*

”



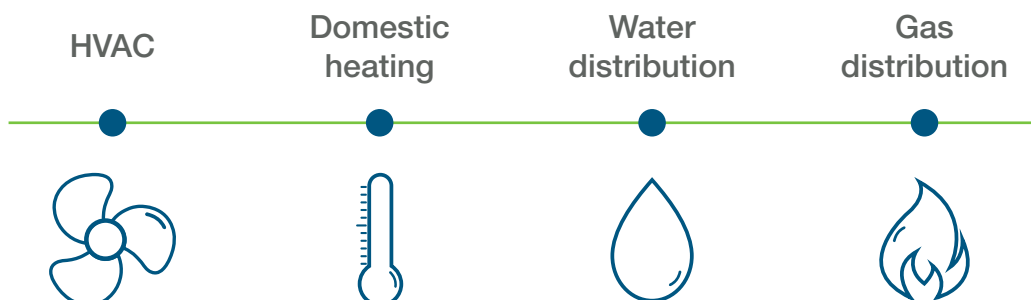
# A SUSTAINABLE COMPANY

01

The company was founded in 1938 by Giuseppe Pettinaroli and his brother Mario. After the world war II that ended in those years, the small local production of water and gas taps gradually expanded, enlarging its operational headquarters and structuring itself with new production departments. In the 50's and 60's Pettinaroli obtained the first international contracts and the business expanded into United States and Russia. Between the 70's and early 80's Pettinaroli experiences a second period of growth that coincides with the construction of a new and larger factory that brings the company to operate in an area of 120.000sqm, of which over 30.000sqm are covered. These were the years on which the second generation, Ugo, Maria Pia and Giulio (Mario's children), joined the company and the first important certifications were obtained, including the one issued by the British Standard Institute (BSI). In 1982 Pettinaroli acquired TSM Galvanocromo, which became its first subsidiary; this was the beginning of a third period of expansion that, this time, would focus on foreign markets. In fact, the 90's and 2000's saw the opening of branches in Switzerland, France, Denmark, United States and UK and dedicated sales desks for Spain & Latin America, Middle East and Far East. Today, more than 80 years after its foundation, still led by the family, Pettinaroli has become an international group with more than 300 employees and a steadily growing business, now involving more than 60 countries around the world.



## BUSINESS AREAS







# OPERATE WHILE PROTECTING THE SURROUNDING ENVIRONMENT

The link between Pettinaroli and its homeland is deep. Since its beginnings, the company has based the development of its business on always putting the safeguard of the environment among its priorities and committing itself to gradually embedding with the local nature and landscape. Today the result is a factory that is fully integrated into the wooded area which extends all around it.



The production facilities are located in San Maurizio d'Opaglio, home to Italy's largest tap manufacturing hub.



## Vision

**We aim to design and develop devices that make building systems more reliable, efficient and sustainable.**

We believe that through continuous research and development it is possible to obtain products with an ever increasing level of energy saving and efficiency. For this reason we pay the utmost attention to quality testing, internal control, process innovation and training of dedicated human resources.

## Mission

Pettinaroli has always been synonymous with quality, in the field of production of components for heating, air conditioning, sanitary installations and gas management. We work daily to create systems that integrate with plants and manage them, constantly improving their performance.



The company, surrounded by a wide garden, is located in the heart of Cusio, a few steps from the shores of Lake Orta.



### 30.000+

SQUARE METERS OF THE PLANTS



### 9

HECTARES OF WOODLAND



### 53

DIFFERENT SPECIES OF TREE



# THE CORE VALUES LEADING PETTINAROLI BUSINESS

In a world where technology and innovation are increasingly central, Pettinaroli continues to keep the legacy and traditions of its distinguished past at its core.

Thus, more than eighty years after its founding, with an open mind and an eye to the future, the company's philosophy remains firmly rooted in the three basic principles of corporate ethics, as handed down in times by its founders:

- 1** **Never give up**  
learning to adapt to the times and situations changing.
- 2** **Never postpone till tomorrow what can be done today**  
providing quick responses is crucial.
- 3** **Live and work always with honesty and rectitude**  
in full respect of the rules.

## PETTINAROLI STAFF KEY NUMBERS

The success of any company is inextricably linked to the professional and human qualities of the people who work in it. This is why in Pettinaroli the care towards human resources has always been deemed central.

The company has constantly invested in the professional training of staff to whom, moreover, specific welfare and benefits policies have been dedicated for more than a decade. The heterogeneity and multiculturalism of the personnel, at all levels of the organizational chart, show how much the concept of inclusivity is part of a long-standing corporate culture.

EMPLOYEES WORLDWIDE



HEADQUARTERS EMPLOYEES



AVERAGE STAFF AGE



STAFF GENDER DISTRIBUTION

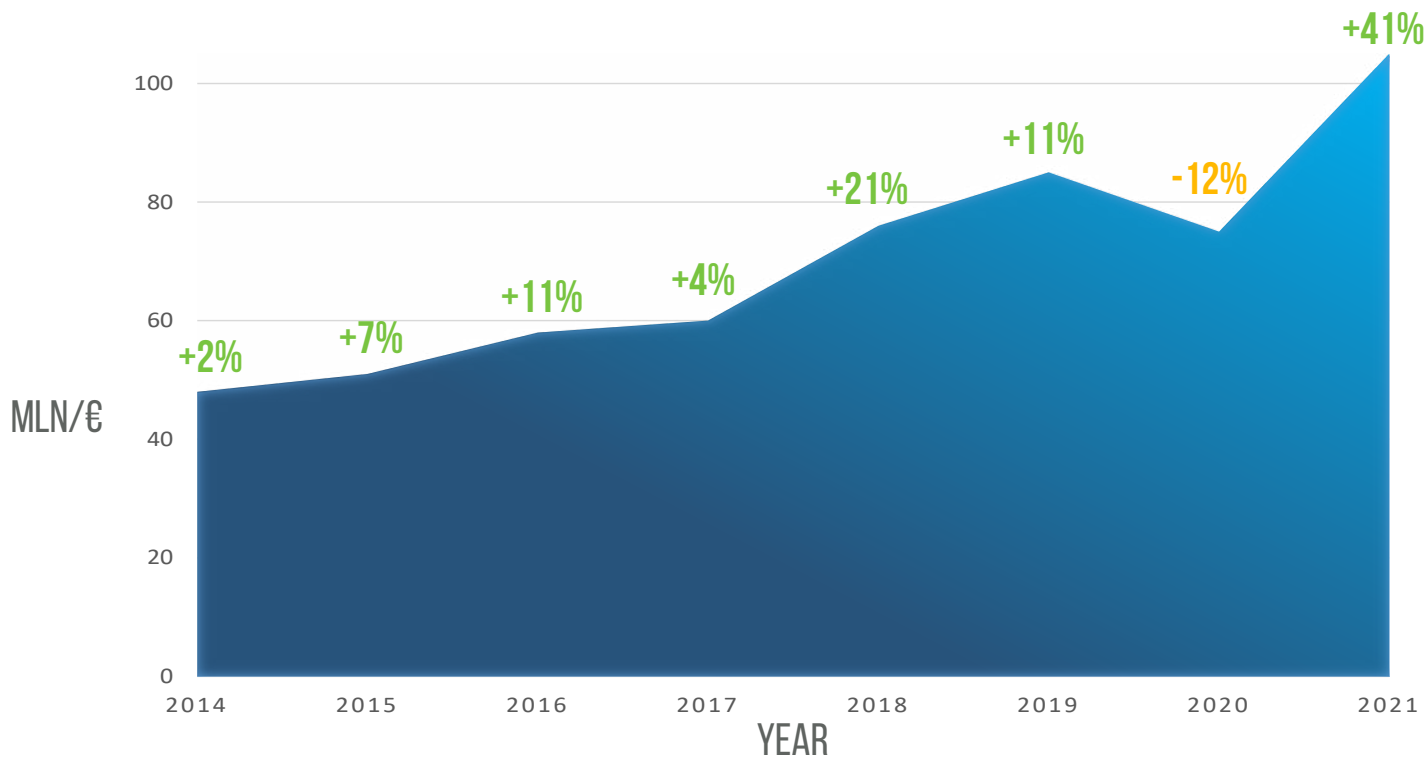


AVERAGE STAFF SENIORITY



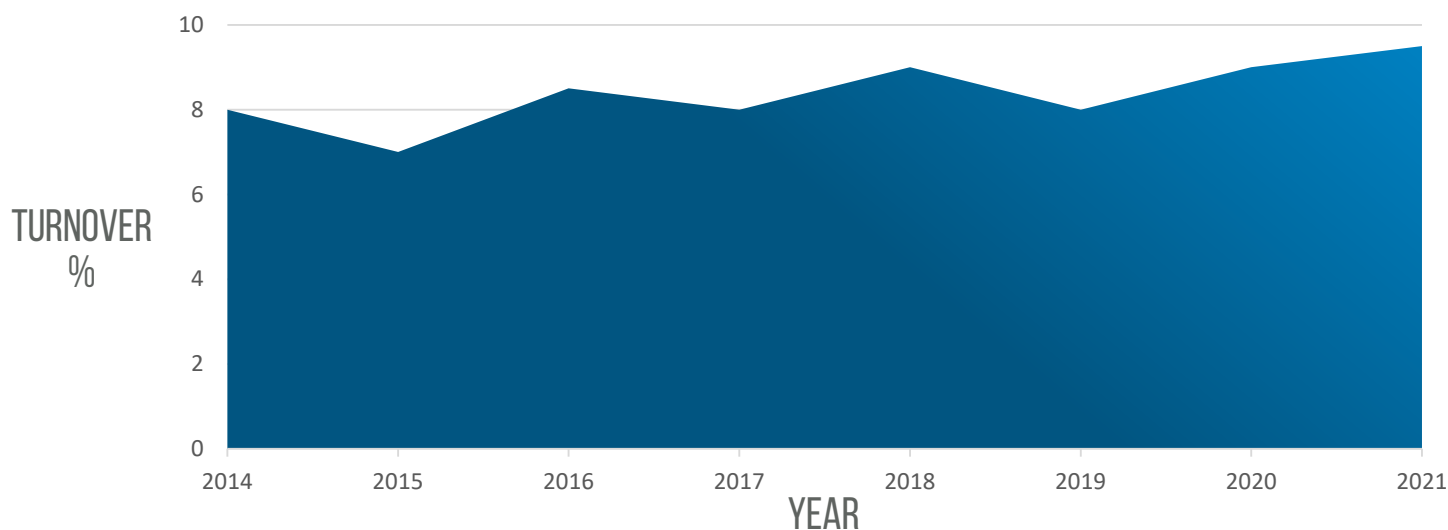
# THE GROUP'S TURNOVER IN THE LAST DECADE

Over the past decade, Pettinaroli Group's turnover has steadily grown, even overcoming the challenges and market slowdown due to the 2020 pandemic and immediately trending back to positive in early 2021.



# CONSTANT INVESTMENTS IN R&D & PRODUCTION

Pettinaroli's business has always been marked by a R&D-oriented and continuous improvement in products and processes philosophy. All this would not be possible without a consistent plan of significant and targeted investments in new technologies and human resources. These are, above all, the key factors behind the stable growth of the Pettinaroli Group over the years.





# HOW MUCH IS THE SUN'S ENERGY WORTH?

Using clean and renewable energy sources is a choice that has been characterizing Pettinaroli's philosophy for a long time and that has been supported by the company through substantial investments made over the years.

One of the most relevant has involved the headquarters in San Maurizio d'Opaglio that, in 2010, has been equipped with a photovoltaic system that covers over 5.000 square meters, covering most of the plants.

In over a decade of operation, the plant has produced remarkable results, both in terms of clean energy generated and in savings of non-renewable energy sources, as summarized in below diagram.

## THE NUMBERS OF THE PHOTOVOLTAIC PLANT ACTIVE SINCE 2010



Despite the significant degree of energy autonomy already achieved, the company is already projected into the future.

Since 2022 Pettinaroli uses electricity entirely derived from renewable sources. Within the decade, then, is expected a further major investment aimed at doubling the size of the photovoltaic system, with the target of generating an electricity production almost sufficient to supply the entire demand of the company.

# 80%

## SELF-PRODUCED HOT WATER DEMAND

# 3.000

**Water litres**

that the storage tanks, located inside the plants, are able to collect and reintroduce in the hydraulic circuit in the form of hot water.

**Pettinaroli's factory buildings are equipped with multiple solar panel systems.**

The presence of solar panels, located in strategic areas of the company that benefit from great exposure to sunlight, allows the self-production of over 80% of the daily demand for hot water consumed by the manufacturing departments and offices.



**PETTINAROLI**  
TECHNOLOGY S.p.A.



938  
018

**PETTINAROLI**  
TECHNOLOGY S.p.A.

**PETTINAROLI**  
WORLDWIDE GROUP

- PETTINAROLI** S.p.A.
- PETTINAROLI** S.p.A.
- PETTINAROLI** S.p.A.
- PETTINAROLI** S.p.A.
- MARFLOW** HYDRONICS



FCS

Row 92  
SYNASTY





**“** Exhibition events in our industry represent an essential showcase however they are the source of possible and significant waste of disposable materials. For this reason, we decided to move toward the use of a system that would allow the recovery of nearly the total of structures used for each event in order to reuse them to build the following exhibition booths. **”**



Joining numerous trade shows throughout the year requires the construction of large booths.

Therefore, in Pettinaroli we worked to build our exhibition stand by limiting the use of disposable materials as much as possible.

03

## EXHIBITING WHILE LIMITING WASTE

BUILDING TEMPORARY  
DISPLAY SPACES WITH A  
STRONG VISUAL IMPACT  
WHILE LIMITING WASTE?  
IT CAN BE DONE!



THANKS TO THE OCTANORM® MODULAR SYSTEM  
EXHIBITION STRUCTURES ARE REUSED OVER TIME.  
SAME MATERIALS, DIFFERENT STANDS EACH TIME!

Attending an average of at least two major international trade fair events per year and dozens of other smaller national events in various countries around the world, the use of disposable structures to build exhibition booths

would have resulted in a huge amount of one-use material ending up being added to the “waste” list. For this reason, in Pettinaroli we decided to opt for the use of a system that would allow the recovery of almost all the materials needed for

each event, in order to reuse them to make the structures of the following exhibitions. The Octanorm® system, which the company has chosen since the early 80’s, perfectly accommodates this purpose. From fair to fair, the stands are thus assembled and then disassembled, allowing the modular steel structures and much of the panels and canvas already used to be transported to the next event venues, thus limiting the use of new components.

# PLASTICS: A PRECIOUS MATERIAL TO BE USED RESPONSIBLY



10 recycled bottles

allow to produce a polyester sweater



400 years

the time it takes for a plastic bottle to degrade



it takes 17.500 liters of water to produce 30.000 bottles

to transport water, almost half of its content is consumed!

# 12.000+

disposable plastic bottles saved every year

## FAREWELL TO DISPOSABLE PLASTIC BOTTLES!

The safeguarding of our surroundings goes not only through great choices, but also through simple everyday actions. Often from our most trivial habits spring enormous consequences for the environment around us. This is the case, for example, with the use of disposable plastic bottles, which contain a commodity as basic but quickly and immediately consumed as water. Plastic is a noble material with

excellent qualities of strength and durability. This is precisely why its use is antithetical to a “disposable” purpose. Moreover, the high environmental impact for its production makes it incompatible with the concept of eco-sustainability. That is why, in 2019, this issue prompted serious reflection that led Pettinaroli to choose to immediately zero out a monthly consumption of more than a thousand

disposable plastic bottles, introducing the use of drinking water dispensing machines and practical reusable water bottles. Thanks to this decision, the company has already achieved the remarkable goal of avoiding the consumption of more than 12,000 disposable plastic bottles consumed each year! Plastic is a useful and important material, it is how we use it that makes the difference!



# ECOSUSTAINABLE PRODUCTION

## RECYCLABLE PACKAGING DESIGNED TO REDUCE WASTE

### What does the data tell us about logistics?

A company like Pettinaroli generates very significant numbers in terms of material and goods handling. Clearly, consumption and pollution deriving from packaging would increase accordingly if responsible choices were not made. To meet this crucial need, the company has chosen packaging made

entirely of recyclable (and, where possible, recycled) material and each component is enclosed in packaging designed to require the least possible amount of boxing objects. Moreover, the inks used for the numerous pad-prints on the products (for example on the handles of the ball valves) are water-based and therefore non-toxic.

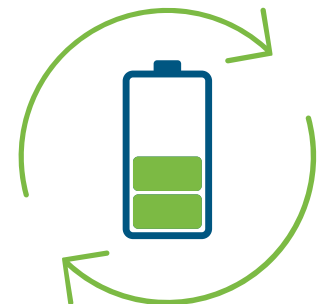


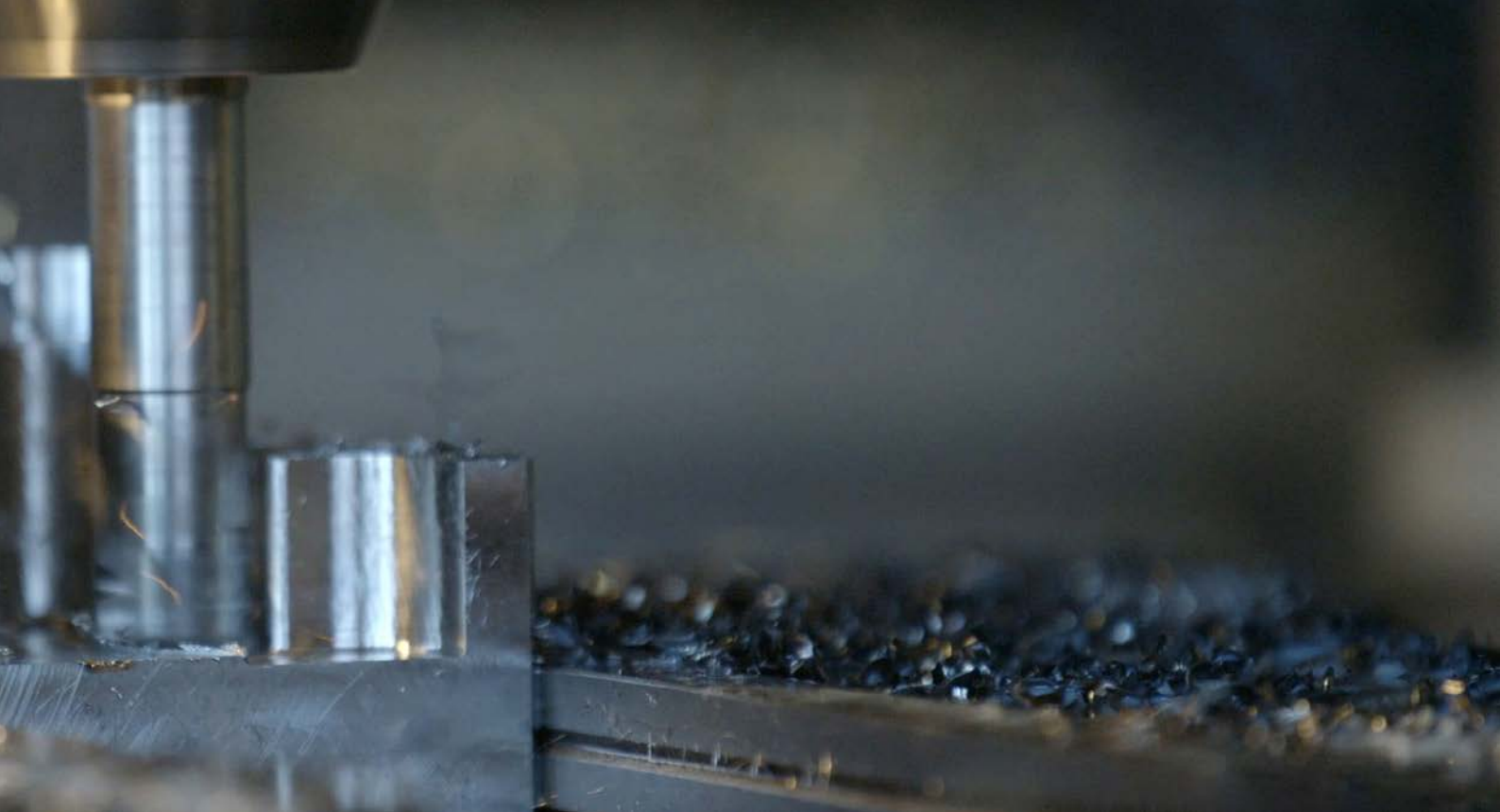
## ZERO EMISSION INTERNAL TRANSPORT

Not only traditional vehicles such as forklifts, but also less conventional material handling devices, such as the internal transportation train, are powered by electricity.

**In Pettinaroli the internal material handling is zero-emission.** All the vehicles used to move components, finished products and packages in production, assembly and shipping department are powered by electricity generated by the photovoltaic system. In addition to the most common forklifts, whose number in production exceeds 10 units, there are other less conventional electric transport vehicles. This is the case, for example, of the ETV (Electric Transport Vehicle), a “small train” that carries components from the turnery to

the assembly department. The ETV travels 15 times a day back and forth, over a distance of about 400 meters. The turnery itself has its own zero-emission handling system for internal material transport. A small robot, capable of transporting weights of up to 500 kg, is responsible for the autonomous carriage of equipment and tools from the warehouse to the individual operating machines. In this way the department is supplied with the necessary equipment to work without requiring the presence of operators or heavy vehicles for handling.





## LOW CONSUMPTION LIGHTING FOR ENERGY SAVING

**The surface area of Pettinaroli's factories and office buildings exceeds 30.000 square metres. Therefore, even an apparently minor detail, such as the lighting of the buildings, has a particular impact on the total energy consumption.** For this reason, over the years all the lighting systems in the offices and production departments have been equipped

with energy-saving technology bulbs. In this way, especially during the winter period when indoor areas require a higher use of artificial lighting, consumption has been reduced. In addition, all exterior lighting has been equipped with ES technology. In this way, the impact of the plants' electricity consumption has been further lowered over the years.



## DISPOSAL AND RECOVERY OF WASTE OILS AND EMULSIONS USED FOR THE PROCESSES

What happens to the oils and emulsions used during and after the parts processing steps within the manufacturing departments?

This is done to aid the turning operations of the machines by keeping temperatures low despite the heating generated by the friction of the tools on the parts. Several systems have been set up to prevent the emulsifying substances used from being lost. Most of these lubricants fall inside special tanks installed on the machines and are returned via pumps in order to be reused. Another small percentage, on the other hand, evaporates during machining and is drained through a special system of air ducts and collected through filters. The remaining part of the emulsion is

deposited on the surface of the chip derived from machining, needing a washing procedure for its collection. To recover it, the swarf is centrifuged in special machines that allow the oils to be gathered by condensing them into a solution, that is then recirculated for use in subsequent processing while maintaining constant chemical values. Exhausted oils are instead stored in a specific area and periodically collected by a specialized company.







05

# MAXIMIZING THE FUEL POTENTIAL

## POWERING A BUILDING WITH **ELECTRICITY, HEAT AND HOT WATER** WHILE OPTIMIZING THE GAS BURNING PROCESS

**Compared to common power generation plants, in a cogeneration system the overall efficiency increases due to a better exploitation of the heating power of the fuel.**

While conventional thermoelectric power plant units convert about 30% of the fuel's potential energy into electricity and the remaining 70% into heat is lost from exhausts in the atmosphere, with a cogeneration plant, more than 80% of the potential energy is converted. In fact, the fuel is partly used to power an engine that produces electricity and partly to produce hot water using the heat and fumes emitted by the engine itself.

**To ensure a virtuous circle, the cogeneration plant needs careful study. In fact, the engine must be sized to the plant's demand for electricity, hot water and heating.**

This particularly concerns the hot water and heating produced by the cogenerator. While selling surplus electricity to the national network is possible, hot water and heating cannot be stored or sold to third parties and must therefore be used entirely within the plant. At TSM, exploitation of the full potential of the plant is possible through the use of hot water, which is needed year-round for use in the galvanic bath tanks.



# 100%

## HOT WATER PRODUCED BY COGENERATOR

Thanks to the cogeneration process it is possible to optimize the efficiency of the gas combustion that feeds the plant.

The process makes it possible to limit the loss of energy to only about 10% to 15% of the entire potential of the fuel used.

**The hot water produced by this process is sufficient to cover all of TSM's production and heating demands.**

### HOW DOES TSM COGENERATION PLANT WORK?

#### 1 Fuel

The gas feeds the engine of the cogeneration plant installed inside TSM factory

#### 2 Electric Energy Production

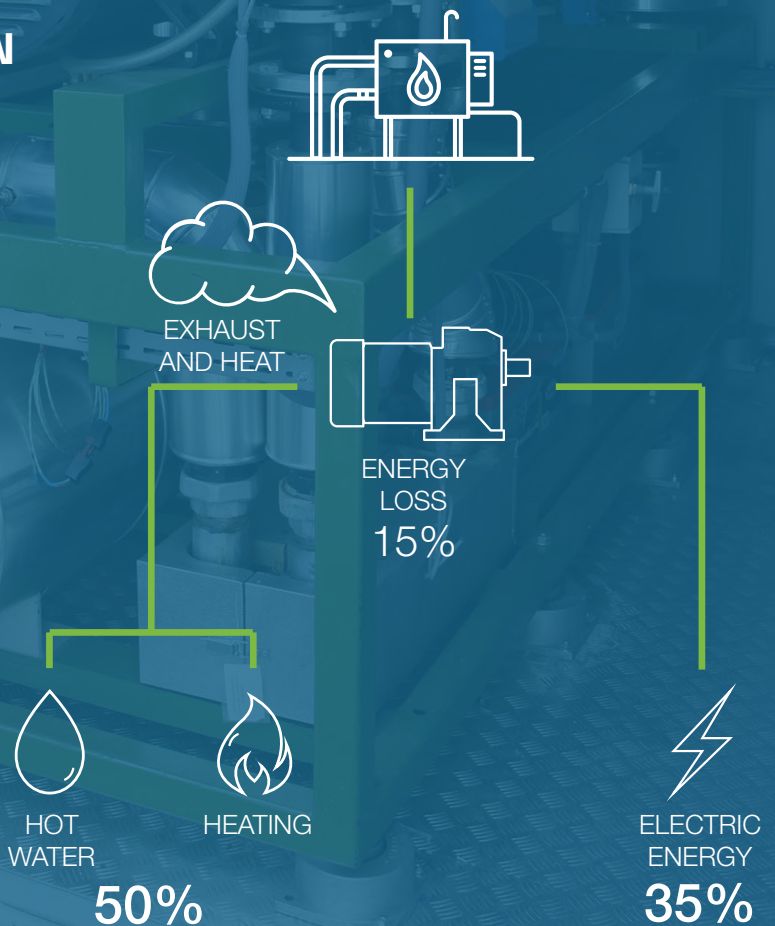
The engine converts about 35% of the gas potential energy into electric energy

#### 3 Cogeneration

The heat and exhaust generated by the movement of the engine are used to heat coils containing water, thus enabling more than 80% of the potential energy of the fuel to be used.

#### 4 Hot Water production

The hot water, which can reach 80°, is used both to supply the galvanic baths and to heat the plant.











“

*Brass is characterized by its complete recyclability. This material proves to be reusable without suffering any alteration of its original properties. The waste from mechanical processing, known as scraps or shavings, as well as disposed products, are in fact completely recoverable and can be recasted to return to the market in the form of new bars, thus generating a circular life cycle.*

”



# BRASS AND CIRCULAR ECONOMY

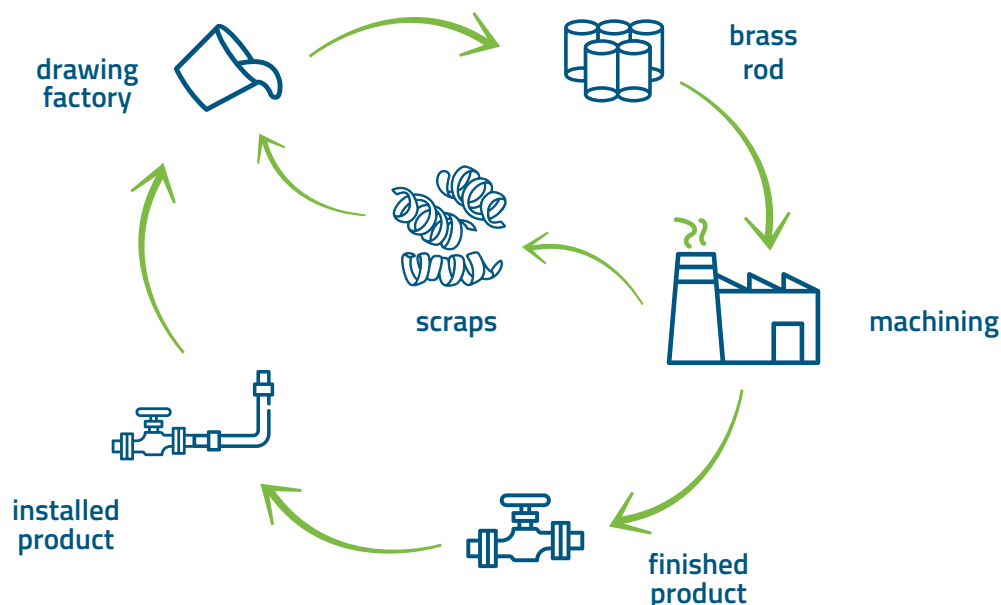


## NATURALLY ECO-SUSTAINABLE

The main features and properties of brass that make it one of the most widespread, appreciated and used materials in the metalworking industry are: mechanical capacity, workability, hygiene, conductivity, recyclability, and low energy consumption. Brass ensures higher and better mechanical performances compared to other materials. Among these is the capacity of brass bars to withstand temperatures as low as  $-250^{\circ}\text{C}$ . But among the most interesting peculiarities of brass we definitely find its great malleability and workability. This means that brass can be used to make any type of tool and device, taking advantage of its ductility of use in any type of industry. Although brass requires special machinery and a significant amount of energy to be machined (especially for the low lead content alloys used for the production of components for use with drinking water) this material also stands out for its high performance in reducing energy consumption. This is because producing brass components requires, for example, less than half the energy needed to produce the same component in steel. Last but not least, especially when it comes to the topic

of eco-sustainability, brass stands out for its complete recyclability. Today, more than ever, the attention for ecology and sustainability is higher than in the past and being able to count on the massive use of a recyclable material is certainly an advantage that should not be missed. Brass in this sense is extraordinarily effective, being completely reusable without losing any of its original properties. The scraps of mechanical processing, also called chips or shavings, are in fact submitted to a washing process (which separates them from all substances such as emulsifying solutions used during processing) and to a storage in different silos according to their composition. This process allows the reuse of waste materials, lowering production costs and significantly reducing waste. The recovered material is in fact resold to the drawing mills that melt it down and put it back on the market ready to be processed again. As well as processing residues, products at the end of their life cycle can also be recycled and recast for total material recovery. This is why we can say that the life cycle of brass is completely circular and sustainable.

## THE BRASS "CIRCULAR" LIFE CYCLE



# RECYCLING PROCESS OF BRASS SCRAPS



## COLLECTION AND WASHING

Brass scraps are collected, separated according to the different alloys and washed with hot water to separate them from the emulsifying solutions.



## RECYCLING AND STORAGE

The hot water that has rinsed off the emulsifying oil is reused for refills while the chips are stored in the different collection silos according to their alloy composition.



## DISPOSAL AND RECAST

Chips are given to the foundry which reuses them to generate new brass bars, thus creating a “closed cycle” which avoids waste.

**Brass is a material that can withstand multiple cycles of use without generating waste.**

# BRASS, OUR RAW MATERIAL PAR EXCELLENCE.

## KEY NUMBERS:

**5** Types

We machine standard, low-lead and anti-dezincification brass.

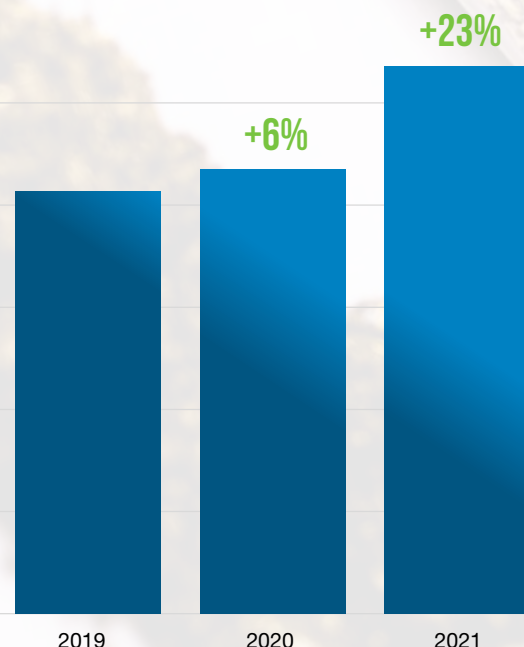
**40%**

### Recycled brass

In the form of scraps that are recovered and remelted by the drawing companies.

## LOW LEAD CONTENT BRASS

The diagram below shows how the percentage of “low lead” brass alloys used in production has grown by 29% in the last three years:





HVAC products allow to optimally regulate and manage hydronic and air conditioning systems.

07

# PRODUCTS FOR ENERGY EFFICIENCY

## HVAC: KITS AND VALVES FOR THE HYDRONIC SYSTEM'S BALANCING



**Our corporate ethics and our sense of responsibility towards the planet and the new generations drive us to design and build products and systems that are increasingly efficient and energy saving.**

So since the beginning of the new millennium, we have specialized in research and development of HVAC solutions, especially with in mind buildings where these systems are in operation 24/7, such as in public facilities and large residential constructions. For such applications, PICVs (Pressure Independent Control Valves) such as Pettinaroli's EvoPICVs represent state-of-the-art water balancing and control products. In fact, these valves significantly reduce the energy demand for pumping water along the HVAC distribution

network. Bringing the right amount of water to the right place at the right time: that's the goal of any balancing and control valve and that's exactly what a PICV does. Pettinaroli's EvoPICVs also guarantee better performance thanks to their Equipercantage feature. In fact, this is the most suitable control feature to be used in combination with water-to-air units, as it provides the terminal unit with the right amount of water at all times. After all, only the combination of an equipercantage control valve on a water unit makes a linear control system easy to control from the BMS. In this way, only the minimum amount of water required for proper operation passes through the unit. This process generates great energy savings: due to the law of affinity, the relationship between flow rate (pump speed) and pump

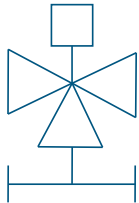
power is cubic; 50% less water flowing through the systems means 87.5% less energy consumed by the pump. A huge energy saving, combined with a very significant return on investment! Pettinaroli PICVs are also included in PCS (Pettinaroli Commissioning Solutions) pre-assembled hydronic kits intended for applications in large projects. PCS kits provide numerous advantages to all those involved in the construction chain. For designers, who can agree in advance on the specifications of the kit, saving time and identifying the best technical solution; for installers, who can carry out the installation immediately, eliminating all the risks involved in assembling the individual components on site. In this way the customer can be sure to receive the best solution tailored to his needs, 100% tested and ready to be installed.

# DEVICES FOR CLIMATE SYSTEM'S BALANCING

Choosing the best balancing solution is crucial to achieving good functionality of a hydronic system and proper operation of the terminal units connected to it; and a well-balanced system means a system with reduced energy consumption.

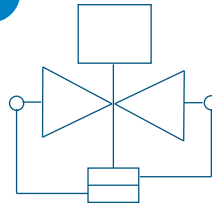
The example below shows in percentages what has just been described:

1



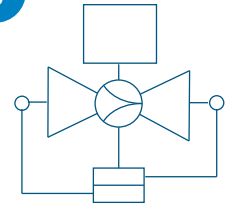
Constant flow  
4-way control valves

2



Variable flow  
Linear PICV

3



Variable flow  
Equipercantage PICV

## ENERGY CONSUMPTION PERCENTAGE



### 4-way constant flow

In this system's set-up, the reduction of flow rate through the terminal units is done by opening a by-pass. The pumps always run at maximum speed.

As a result, there is:

- Increased energy waste
- Reduced energy efficiency

### Linear PICV

Linear PICVs provide a good level of flow control, allowing the pumps to limit their speed under part-load conditions.

This results in the following:

- Reduced energy waste
- Improved energy efficiency

### EQM (Equipercantage) PICV

PICVs with an equipercent characteristic allow optimal control of the flow rate, which will always be the lowest possible (only what is needed).

The pumps will be able to run at the lowest possible speed to provide the required thermal power.

Therefore, there is:

- Extremely low energy waste
- Maximum efficiency and energy saving

**BEST SOLUTION**







**“** Environmentally friendly surface treatments such as White P Bronze and TEA+ are the result of the significant investments made by TSM over the years to develop innovative coatings with increasingly higher performance and less footprint on the entire supply chain, which includes environment, operators and end users of the products. **”**



# ECOLOGICAL SURFACE TREATMENTS

## GALVANIC COATINGS INCREASE THE SURFACE RESISTANCE OF PRODUCTS

thus extending their life cycle and decreasing their deterioration due to wear and tear.



## TSM COATINGS AIM FOR A EVER LOWER ENVIRONMENTAL IMPACT

### Quality with an eye to eco-sustainability

**Electroplating is inextricably linked to the use of chemical products and therefore to potentially toxic materials, which must necessarily be managed, processed and disposed with the utmost care.**

**So how is it possible to keep a galvanic plant operational and at the same time not pollute?**

Obviously, there are specific legal regulations that every company operating in the field of electroplating is required to follow but, in addition to these, research and development remain crucial factors in the development of new and better solutions. Since its acquisition in 1982 and following the numerous renovations and expansions carried out at the Gozzano site, TSM has not limited itself to applying the best existing technology. In the spirit of what is, to all intents and purposes, the philosophy of the entire Pettinaroli Group, the company has invested heavily in the development of innovative treatments aimed at improving the performance of coatings while reducing the impact on the whole supply chain, including the environment, operators and end users of the products. Just think, for example, about TEA (Ternary Eco Alloy) introduced by TSM in collaboration with La Tecnogalvano back in 2004.

This coating has immediately become a benchmark for various types of products (components for taps and fittings and components for the food sector such as professional coffee machines, tapers and carbonators). Thanks to the properties of TEA, the migration of metals from the product is significantly reduced compared to traditional nickel or nickel-chrome treatments, thus ensuring product compliance with the technical standards of the sector (NSF/ANSI/CAN 61, NKB Rules etc....). The finishing has then evolved into TEA+, introduced in order to meet the most severe requirements in terms of metal release for the European market. TSM took then a further step forward by developing a nickel-free treatment, the "White P Bronze". In this case, in addition to a health benefit (given by the reduction of the concentration of metals released into the water), there is also one for the environment (the treatment requires lower temperatures for the process, which results in a lower use of electricity compared to other galvanic treatments). Finally, since 2022 TSM has also been carrying out PVD (Physical Vapor Deposition) treatments. This coating represents one of the most advanced frontiers in terms of coatings as this metal deposit is resistant, non-allergenic, non-toxic and substantially free of production residues. And what about chrome plating? TSM is ahead of its time by already being able to supply trivalent chrome coatings. This is in anticipation of the upcoming restrictions that the European Community will introduce on the use of chromium trioxide. Although currently not perfectly comparable to hexavalent chromium on a mechanical/performance level, trivalent chromium guarantees a healthier and safer working environment for operators.

# THE ECO-FRIENDLY SURFACE TREATMENTS MADE IN TSM :

Four different materials, commoned by **resistance** and **eco-compatibility** features.

## PVD



Physical Vapor Deposition (PVD) is the technology used to apply a thin metal film to the surface of a part. The process takes place inside vacuum chambers, where the PVD coating is generated through the evaporation of the metals that are deposited on the pieces hanged on special frames placed inside the chamber.

## CHROMING



Chromium gives the coating unique and indispensable properties for several industrial applications such as high wear resistance and durability against the corrosive action of chemical agents. Under the Trivalent Chromium (Cr +3) is applied an primer layer of White P Bronze (which does not contain nickel).

## WHITE BRONZE



The White P Bronze surface treatment deposits a superficial layer composed of a binary intermetallic alloy of tin and copper. The total absence of nickel makes this coating environmentally friendly and ideal for the treatment of products in contact with drinking water. White P Bronze is therefore a valid finish or an excellent undercoat for the chromium plating process with Cr +3

## TEA+



TEA+ (Ternary Eco Alloy) surface treatment deposits an intermetallic alloy composed of tin and nickel. Once the deposition process is completed, the coating obtained has the property of not releasing nickel in water, making it a valid finish or under layer to be used on components intended for the treatment of drinking water.



## WHERE DO THE RESIDUES FROM ELECTROPLATING PROCESSES END UP?

**Every waste material resulting from galvanic processing undergoes specific treatments in order not to generate pollution during its disposal stage.**

Water containing residues from galvanic processes undergoes internal purification cycles and is only returned to the public network once it has been completely cleaned and is free of traces of toxic agents. In order to guarantee the correct management of the dumping, the activity is constantly monitored through sensors that regularly take water samples during the day, which are then collected and analyzed by the competent authorities. The residues gathered are instead subjected to treatment cycles inside concentrators before being properly stored and disposed of in accordance with the specific rules.



Ecovadis is one of the most prestigious international platforms for assessing the level of corporate sustainability.

# 09 CERTIFIED SUSTAINABILITY

## ECOVADIS CERTIFIES THE HIGH SUSTAINABILITY INDEX OF THE PRODUCTION CHAIN OF COMPANIES

In 2020, Pettinaroli voluntary underwent Ecovadis assessment, obtaining an initial Bronze medal rating. However, Ecovadis certification, by its nature, is a useful parameter for constant improvement work over time. Therefore, the company has continued and keeps applying itself to implement an increasingly sustainable process system. The first results came in early 2022 with the progression of the rating from Bronze to Silver medal.

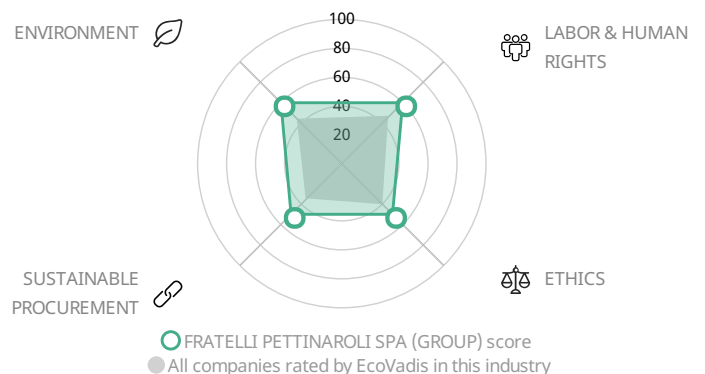
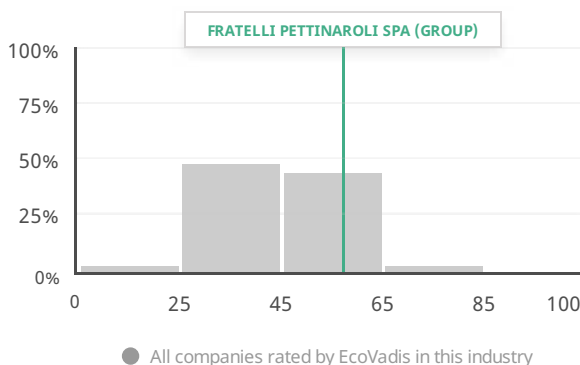


Ecovadis certification assigns a score that allows the company to objectively demonstrate the degree of sustainability of its supply chain to potential customers, who are increasingly interested in purchasing from responsible suppliers.

The evaluation model is based on globally recognized standards and consists of verifying the supplier's performance in relation to 4 macro-areas:

- Environment
- Labor and Human Rights
- Ethics
- Sustainable Procurements

### PETTINAROLI'S RATING IS ABOVE THE INDUSTRY AVERAGE:



# EPD ENVIRONMENTAL PRODUCT DECLARATION

Environmental product labels ease communication between manufacturers and customers. They also play an important role in the procurement processes of large multinational groups, construction projects and public sector contracts.

Growing consumer awareness towards sustainability issues, together with the opportunity for companies that perform well in this matter to increase their competitiveness, is generating a strong boost of communication activities related to the environmental footprint performance of products.

For this reason, at the beginning of 2022, following the request of some Northern European customers, Pettinaroli began the study for the creation of an EPD (Environmental Product Declaration). The Declaration refers to the ISO 14025:2010 standard and is composed of "Type III Environmental Labels", i.e. documents through which the manufacturer communicates data and information related to the environmental performance of products and services offered. Type III labels are exclusively informative and do

not foresee evaluation methods, preference criteria or minimum levels to be respected. In the case of EPDs, this is a voluntary certificate for a product or a family of products, containing all the information featuring it, from the extraction of the raw materials used for its production, through all the phases necessary for its construction, installation and operation, up to its disposal. This declaration therefore highlights all the production processes, raw materials, supplies, the amount of energy and water used, as well as the logistic processes employed from the extraction and handling of raw materials, to the disposal of the finished product. All of this is done through Life Cycle Assessment (LCA), which is also regulated by an ISO standard, 14040:2021. This all ultimately documents the environmental impact that a product generates from its "birth" to its "death."

## THE PRODUCT LIFE CYCLE:



ISO 14001



The acronym ISO 14001 identifies the International Organization for Standardization (ISO) technical standard on environmental management systems (EMS) that sets out the requirements for an organization's environmental management system. Obtaining ISO 14001 certification demonstrates that the organization has an appropriate management system to control the environmental impacts of its activities, and systematically seeks to improve in a consistent, effective and, above all, sustainable way. To be certified according to ISO 14001 is not mandatory, but it is the result of a voluntary choice of the company that decides to establish, implement, maintain and improve its own environmental management system.

ISO 50001



ISO 50001 Energy Management Systems - Requirements with guidance, specifies the conditions for setting up and implement an energy management system (EnMS), maintaining and improving it over time. It aims to enable an organization to follow a systematic approach to achieving continuous improvement in energy performance and EnMS. The standard outlines a roadmap that includes requirements for creating, starting, maintaining, and improving the energy management system. The objective of such a system is to enable an organization to pursue, through a systematic approach, the continuous enhancement of its energy performance by including in it efficiency criteria as well as optimal energy consumption and use.





# THE LAKE CONTRACT

## ACTIVE POLICIES TO SUPPORT THE TERRITORY

10

### AN EFFECTIVE ACTION FOR THE SAFEGUARD OF ORTA LAKE

Pettinaroli has adhered, together with other companies and local authorities, to the signing of a "lake contract" including both the commitment to protect the territory that includes Lake Orta, and to promote initiatives for its further development over the years.

**The "lake contract" is a commitment shared by more than a hundred companies and local authorities in the Novara and Verbano Cusio Ossola area, to protect Lake Orta, an area heavily affected by industrial pollution until the early 80's.**

Thanks to this association, all participants have risen up to preserve the lake, committing themselves not only to not pollute it but also to finance (either through the access to European funds) numerous initiatives aimed at improving its conditions. Thanks to the process

### GOALS:

- Constant monitoring and evaluation of the hydrogeological situation
- Improvement of water and sediment ecological status
- Redevelopment of environmental systems of disused factories
- Landscape enhancement of the settlements around the lake
- Historical and cultural enhancement of the "places of the lake"
- Promoting the sustainable use of the lake
- Incentivizing landscaping and cleanup of surrounding areas
- Educational and training moments to learn and share information

of "liming" implemented in 1990, which consisted in adding carbonates to the water of the lake to neutralize its acidity, Lake Orta has gone from being the scene of an enormous environmental disaster to obtaining a blue flag from the FEE (Foundation for Environmental Education) in 2021 for the quality of its waters. The Lake Contract aims precisely to continue on this path, maintaining high attention and sensitivity to the present and future preservation and development of the delicate lake ecosystem.

# ACADEMY

## PROFESSIONAL TRAINING PROJECT

Pettinaroli in collaboration with the Municipality of San Maurizio d'Opaglio (No), Confindustria Novara Vercelli Valsesia (Cnvv), Foraz and three other companies in the industry, created the Academy, project intended to promote professional growth in the area, to reduce the gap between supply and demand for labor, retrain employees and offer them opportunities for specialization tailored to the needs of businesses.

### GOALS:

#### Realization of a training center

to respond to the need for advanced professional skills that all companies in the district have been reporting for a long time

#### Headquarters in the Cnvv delegation of Borgomanero (No)

it will be allowed to carry out some courses also in neighbouring localities that are part of the world's largest brass transformation pole

#### Upskilling and reskilling for employed and post-graduate

to increase the skills of employed workers and qualify, with specialized technical training, unemployed and inactive people

### The numbers of the largest Italian district of brass transformation :

15%



OF WORLDWIDE  
MARKET

11.500+



PEOPLE  
EMPLOYEES

7,5+bn.



TOTAL  
TOURNOVER

4



COMPANIES INVOLVED  
IN THE PROJECT





