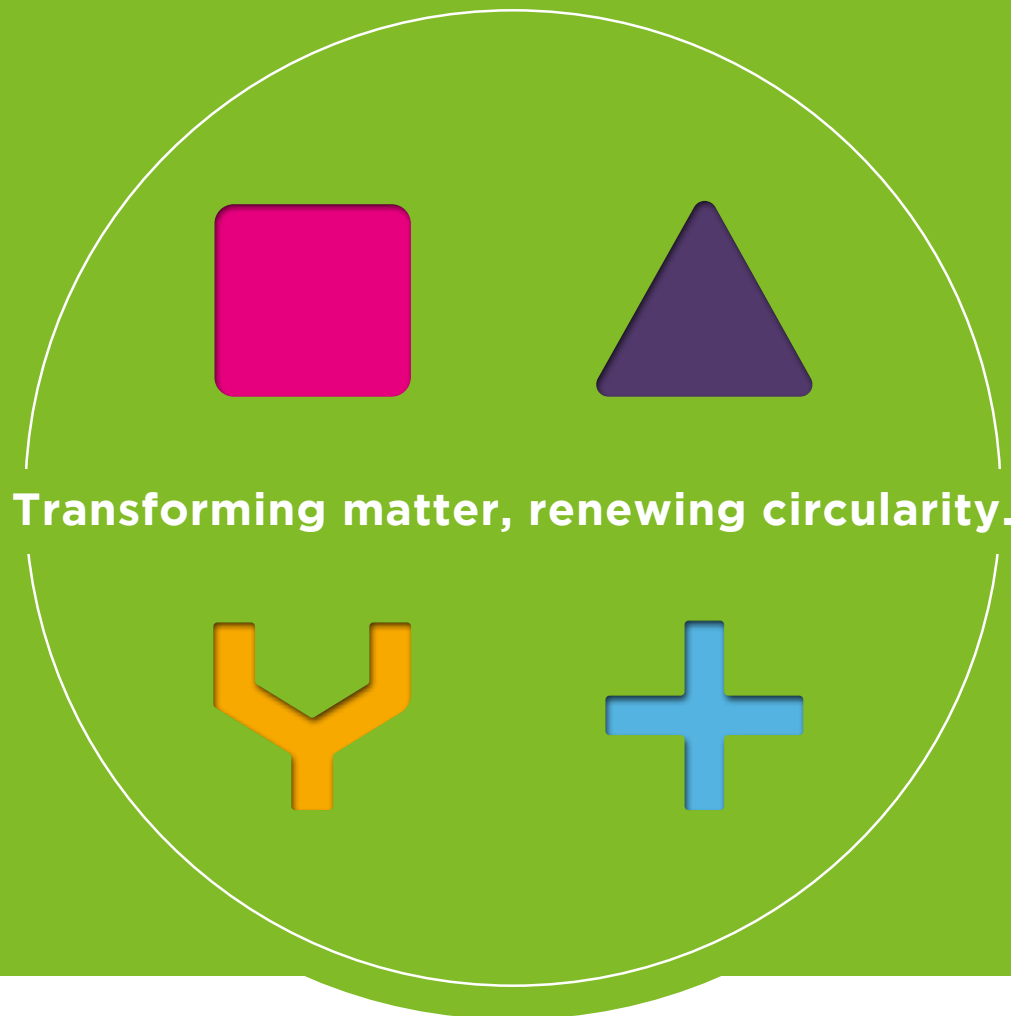




**Transforming matter, renewing circularity.**

To redesign matters.

**CAVIRO**  
— EXTRA —



## Extra **Alcohols**

ethanol of agricultural origin

## Extra **Musts and Extracts**

grape must and juice,  
grape pips, oenocyanin

We transform waste from the wine and food production chains into noble ingredients and energy.

## Extra **Tartaric**

natural tartaric acid

## Extra **Eco-Energy**

purification, renewable energy,  
natural fertilisers



## EXTRA **is the place**

where waste is transformed  
and enhanced.

## EXTRA **is the process**

that shows the infinite value of wine  
and food products.

## EXTRA **is the natural ingredient**

that the industrial world needs.

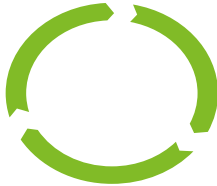
## EXTRA **is innovation**

that creates new energy without  
depleting natural resources.

## EXTRA **is the circular economy**

of Caviro, Italy's largest  
wine-making industry.

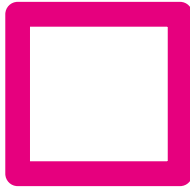
# With Caviro, the past fuels the future.



## Caviro Extra

redesigning matter

5



## Extra Alcohols

ethanol of agricultural origin

13



## Extra Musts and Extracts

grape must and juice,  
grape pips, oenocyanin

17



## Extra Tartaric

natural tartaric acid

21



## Extra Eco-Energy

purification, renewable energy,  
natural fertilisers

25





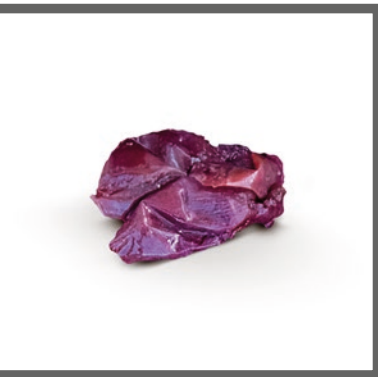
Caviro Extra

# Redesigning matter.

Caviro Extra is a **Circular Company** driving innovation in the design of ingredients and products with high added value, derived from **valorising waste from the wine-making and agri-food industries**. Founded from the evolution of traditional distillation processes within the Caviro Group, today Extra provides cutting-edge research and development in **biorefining** and the extraction of **100% bio-based products**, drawing on high technological and process competences and aiming at excellence in environmental protection.

Caviro Extra is the supplier of choice for leading pharmaceutical, food and beverage companies and a partner for the development of **customised solutions**. Operating within a circular economy, Caviro Extra's activities extend from the production of energy from renewable sources and biofuels to CO<sub>2</sub> capture, derived from the biomethane purification process, thereby improving the carbon footprint of the production process.

5



Caviro Extra produces 100% bio-based innovations within a production cycle starting from wine supply chains. The “Legàmi di Vite” project, which involves other wine companies in Emilia Romagna, allowed Caviro Extra to win the “Circular Economy Enterprise” award in 2022.



# The wine industry charts its course from the Caviro Group to Caviro Extra.

From wine production waste Caviro Extra receives marc and lees and transforms them into second-generation raw materials for the industry.

Caviro Extra is a company in the **Caviro Group, Italy's leading cooperative in the wine sector**. With 37,500 hectares of vineyards, 28 partners, 11,100 winegrowers in 7 regions of Italy and a production of more than 600,000 tonnes of grapes, Caviro is, as always, committed to valorising its members' grapes through an integrated supply chain and

the production of a wider range of Italian wines. From the wealth of properties contained in wine production waste, Caviro was inspired to promote a virtuous model of **circular economy** with, at its centre, the **valorisation of every natural resource**, on a path that originates in the vineyard and returns to the vineyard.

6



**11,100**  
winegrowers



**28**  
partners



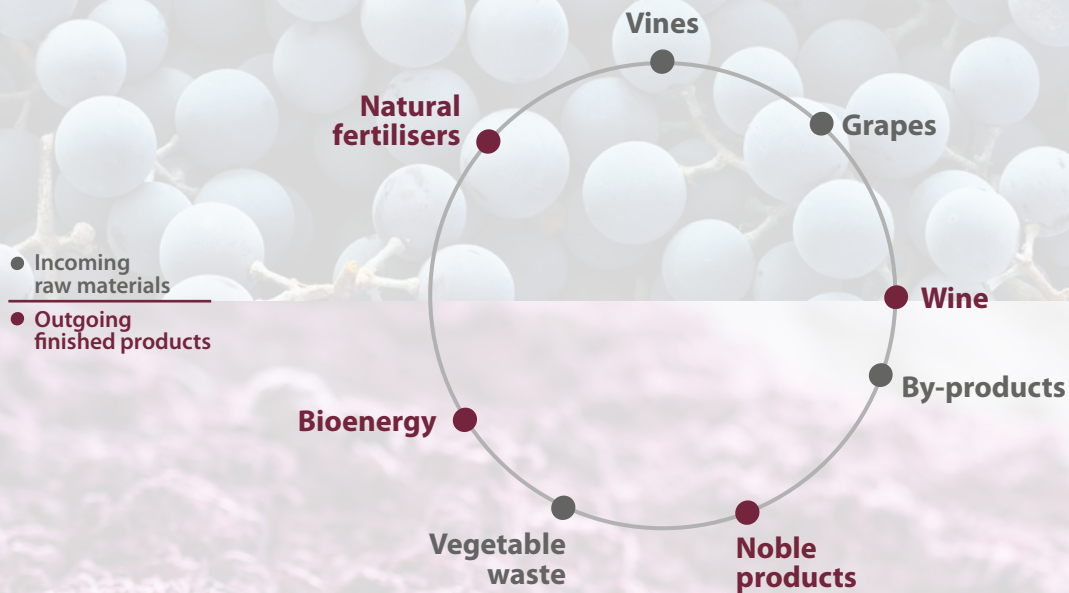
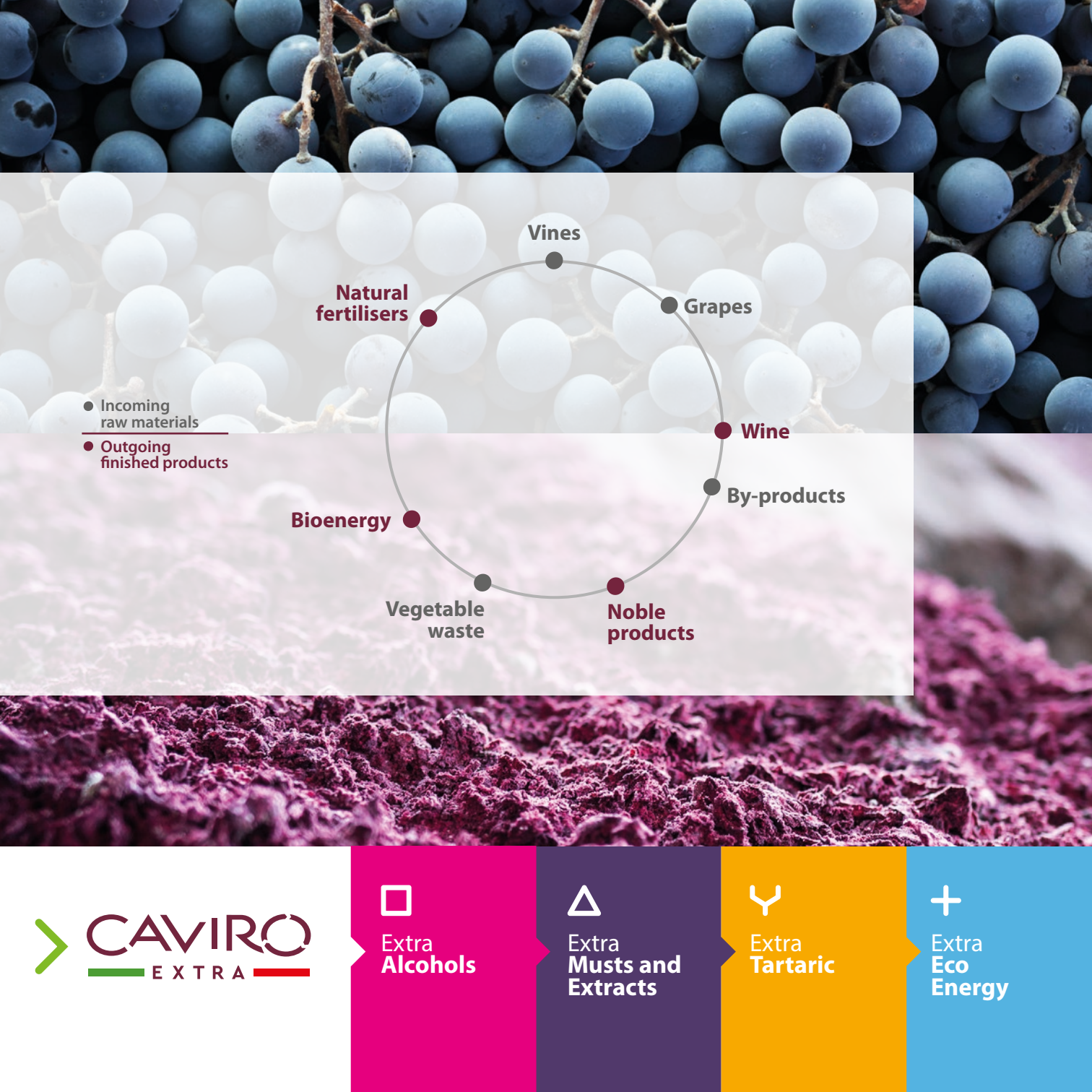
**633,000 tonnes**  
**8,5%**  
of the total grape production in Italy



**175 million**  
litres of bottled wine



**127,000 tonnes**  
of wine production waste including marc and lees



> **CAVIRO**  
EXTRA



Extra  
**Alcohols**



Extra  
**Musts and  
Extracts**



Extra  
**Tartaric**



Extra  
**Eco  
Energy**

# Waste processing creates innovative ingredients, products and services.

## Caviro Extra, the value of waste\*.



Caviro Extra offers a **take-back and treatment service** for waste from the wine (marc and lees) and agri-food sectors. Together with public green waste (prunings and composting rejects), in total it processes approximately 600,000 tonnes of waste per year, which become alcohols, natural tartaric acid, musts, oenocyanin and dried grape seeds, thanks to the most innovative skills and technologies.

Once the production process of noble ingredients is complete, the Extra Eco-Energy business unit takes charge of the residual waste and, through the **biodigestion** plant, produces biogas, from which to produce **biomethane** and **CO<sub>2</sub> capture**, the gas used in the beverage sector. In this way there is almost total recycling of the waste delivered to Extra: only 900 tonnes, about **0.4%** of incoming waste, is unrecoverable.



\*Fiscal year 2022-2023



transferred to public utilities beyond the boundaries of the production site in Faenza  
for a share equal to  
**55%**



whose use allows for emission saving of  
**82,000 tonnes**  
of CO<sub>2</sub>





# Valorisation extends to agri-food and public green waste.

11

**Caviro Extra collects and purifies agri-food waste to produce biomethane and natural fertilisers, together with Enomondo.**

Commitment to sustainability has led Caviro Extra to make its technological **anaerobic digestion** plants available for the **treatment of agri-food wastewater**.

Every year Caviro Extra collects tonnes of waste from companies in the food sector, which it treats, in biodigesters, together with winegrowers' waste to produce biogas, from which it produces advanced biomethane for the transport and renewable energy sectors.

Electric and thermal energy is generated in the thermoelectric power plant developed with **Enomondo**, the company founded in 2010 from a joint venture between Caviro Extra and **Herambiente**.

Residue from the anaerobic digestion process is transformed, along with public green and pruning waste, and processed in the shredder plant into a **natural fertiliser**.





Extra Alcohols  
ethanol of agricultural origin

# From traditional distillation to the most innovative and customised products, we obtain quality alcohol for every field of application.

The Extra Alcohols division stems directly from the experience of distilling the by-products of winemaking, started in the 1970s. **A second-generation quality alcohol, mainly used by the energy industry** for the production of biofuel, is produced from grape processing waste to which first-generation alcohols, generated from cereals and molasses from sugar processing, are added. With its **exclusively agricultural formulations**, Extra Alcohols meets the needs of all sectors of ethanol use - pharmaceutical, cosmetic, food, industrial - from absolute and denatured alcohol, to special alcohols. The production capacity at the Faenza site and the coastal warehouse, located in Ravenna, is over 100 million litres of alcohol.

In addition to a warehouse for the ageing of spirits, there is a denaturing plant for ethanol and a plant to blend bioethanol with petrol. Caviro Extra is one of Italy's leading suppliers of alcohol in the industrial, cosmetic, and pharmaceutical sectors, thanks to its ability to **manage more than fifty authorisation licences online**.

# A versatile raw material and a state-of-the-art, market-oriented R&D laboratory.

Alcohol fermentation and distillation are ancient techniques. There are numerous areas in which Caviro Extra alcohol is used, depending on variations in alcohol strength and purity. In addition to well-established formulations that are already in use, the Caviro Extra R&D team is able to carry out feasibility studies for customised solutions and special recipes for clients.



- Food alcohol
- Absolute alcohol
- Denatured alcohol
- Special denaturants
- Industrial blends
- Bioethanol for biofuel





## Main fields of application



### Food

**Neutral 96° alcohol** of agricultural origin is used for alcoholic beverages, flavourings, essences, and also for confectionery, spirits, vinegar-making and food preservation. At the time of delivery, customers can also make use of the collection service of the soaking medium.

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### Pharmaceuticals

The chemical molecule of **ethanol**, complying with the European Pharmacopoeia, is used as an excipient, solvent and etherifying agent. **Absolute alcohol**, subjected to a drying out process that eliminates water, reaches an alcohol content of 99.9°.

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### Cosmetics

Ethanol is used, after **special denaturing**, in the preparation of various products including perfumes, deodorants, hairsprays, mouthwashes, sanitising gels and general cosmetics.

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### Chemical, Industrial and Domestic sectors

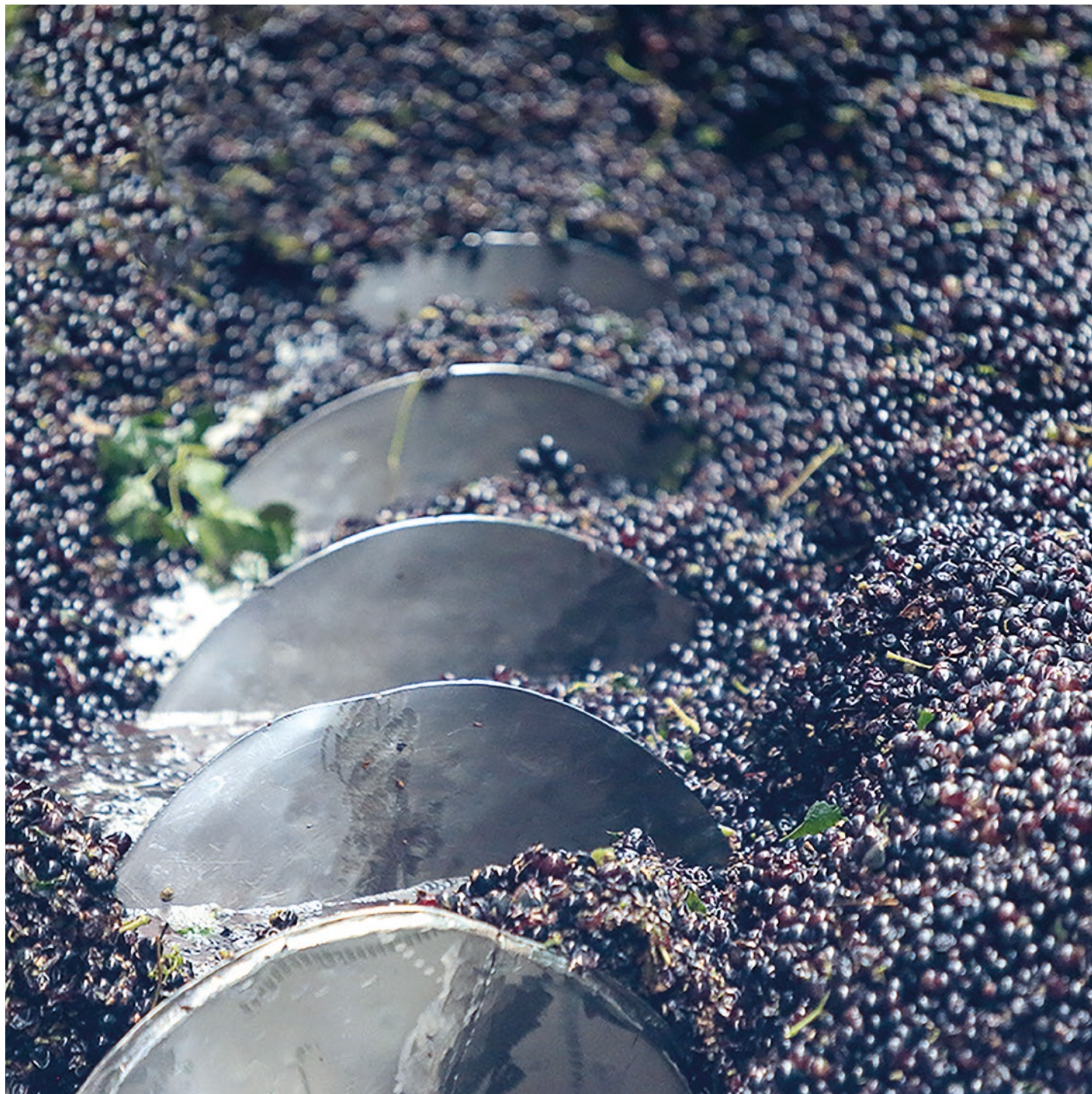
Ethanol is an excellent solvent for fats, resins, esters, organic substances, paints, in flexography and in all applications where the product is a reagent or solvent. General denatured alcohol and special denatured alcohol in **grades ranging** from 90.1° to 99° are also available.

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### Energy and Bio Fuels

Caviro Extra has obtained sustainability certification to market **first generation bioethanol** (of agricultural origin from cereals or molasses) and **advanced 2nd generation bioethanol**, obtained from by-products of the wine production chain, both at a European level and within the Italian national scheme. Bioethanol is used as a renewable automotive fuel, directly blended in petrol or for the production of ETBE. Caviro Extra, in its Faenza plant, also deals with the direct production of blends (E5 to E85), thanks to its specific denaturing plant.





## Extra Musts and Extracts

MCT and MCR, grape must and juice, grape seeds, oenocyanin

# From the crushing of grapes, a short chain that preserves noble ingredients for industry.

Caviro Extra uses the musts and juices from crushing the grapes of the Group's member wineries, to obtain concentrated, rectified or cooked musts for the wine and food sector, and for the production of Balsamic Vinegar from Modena. Extra Must and Extracts is the ideal partner for companies requiring ingredients from a controlled supply chain, whether from organic or conventional cultivation. This is because it can boast a **storage capacity** in refrigerated tanks that maintains product **quality** over time, a vast range of **concentrations** and **customised solutions**, and excellent organoleptic characteristics of the raw material: its colour, acidity, and brix degree.

The Extra Must and Extracts division has carried out intensive research to extract **grape seeds** from the marc in peak condition. These are highly valued by the food industry for the production of oil and parapharmaceuticals, being rich in **polyphenols**. **Oenocyanin**, a natural, deep red food colouring, is also extracted from the marc of red grapes.

# A range of natural ingredients, between tradition and innovation.

The Extra Must and Extracts division develops a range of ingredients with high added value that are vital for many industries.



Rectified Concentrated Must

Concentrated Must

Cooked Must

Concentrated White and Red Grape Juice

Grape Sugar

Tannins

Oenocyanin

Grape pips for polyphenols

Grape pips for oil





## Main fields of application



### Oenology and Vinegar

Cavaro Extra produces musts, including desulphurised musts, for **oenological use**, and is certified for the treatment and production of **Cooked Musts and Concentrated Musts used to produce the balsamic vinegars from Modena PGI**, from vines authorised in the specifications. It is also certified to treat organic products according to EC regulation 2018/848.

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### Food products

**Rectified Concentrated Must** is a liquid and transparent grape sugar, consisting of equal parts of glucose and fructose. Its lower calorie content for sweetness, compared to sucrose, and the natural qualities of grape sugars, make it perfect for the new demands of healthier and more natural foods. Also available **organically**, it is a valuable ingredient for yoghurt and yoghurt-based products, ice cream, desserts, fruit drinks and juices, baking products, sweet and sour condiments, and fruit in syrup. We also supply the food industry with **oenocyanin**, a natural purple-red dye, due to the anthocyanin pigments contained in the skins of red grapes, identified as E163.

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### Parapharmaceuticals, Nutraceuticals, Cosmetics

**Grape seeds** with the highest **polyphenol** content are extracted from the fresh, unfermented marc of grapes of selected origins and varieties. Through a drying process designed to preserve these valuable natural compounds, the grape seeds are then subjected to the next stage of **tannin** extraction or supplied to international companies specialising in processing and marketing the extract, which is used for its **antioxidant power** in many sectors and cutting-edge products.





Extra **Tartaric**  
natural tartaric acid

# Of agricultural origin, the natural solution for food and pharmaceutical companies.

Cavro Extra produces natural tartaric acid, derived from the processing of lees and marc from the wine industry. A highly reliable, **100% bio-based** tartaric acid, free of impurities and extra-white in colour, is obtained by processing calcium tartrate from the by-products of winemaking.

The quality of this natural tartaric acid is the result of 100 years of experience at Tartarica Treviso, today merged into Cavro Extra, and representing the natural choice to replace synthetic, fossil-derived tartaric acid.

# Granulometry, research and innovation, the precision production of Extra Tartarica.

Extra Tartarica can produce crystals in a wide range  
of grain sizes and supports clients  
in finding customised solutions.



Natural tartaric acid



## Main fields of application



### Food products

Cavro Extra tartaric acid is used as an acidifier and **natural** preservative, a component in the production of emulsifiers for industrial baking products, yeast, biscuits, sweets, jellies, jams, carbonated sports drinks, and bases for baby food preparations.



### Oenology

The use of natural tartaric acid as an **acidity corrector in wine** expresses complete circularity: a by-product of grape processing is reintroduced into the wine production cycle.



### Pharmaceuticals and Cosmetics

Natural tartaric acid is used as an **excipient** and **adjuvant** of active ingredients contained, for example, in syrups, capsules, effervescent powders, but also in highly specialised products, such as time-release patches and life-saving drugs. In cosmetics it is often used for the production of creams and powders, where its natural origin becomes a unique quality.



### Chemical and Building Industries

In the industrial and chemical fields, tartaric acid can be used for the production of surfactants, in plasters and cements for plasters, electronic processes, and printing products.



CO<sub>2</sub>

CO<sub>2</sub>



Extra **Eco-Energy**  
purification, renewable energy, natural fertilisers

# At the forefront in the production of renewable organic gases: biogas, advanced biomethane and CO<sub>2</sub> recycling.

Caviro Extra's various business units generate second-generation raw materials by processing and valorising winemaking by-products. What remains at the end of this process - **waste, effluent and digestates** - is exploited by the Extra Eco-Energy division, located downstream of the recycling cycle, transforming it into **energy** and **soil improvers** for agriculture. In the anaerobic digestion plant, biogas is generated from the waste of grape processing, as well as waste from Italian agri-food companies. When further purified, this becomes advanced biomethane for automotive use. In collaboration with Enomondo, part of this biogas is also sent to a cogeneration plant, which produces **electricity, heat**, steam and hot water for the **district heating** network, as well as natural **fertilisers**.

With the more recent development of **advanced biomethane**, also liquefied, and the **total recycling of the CO<sub>2</sub>** resulting from this process, purified to the highest standard for use in food production, Caviro Extra shows its strong commitment to sustainable development and its role at the forefront of the operational processes needed to implement it.

# Products closing the circle of circular economy.

At Caviro Extra we constantly measure the environmental performance of our production process, sharing it with suppliers and clients, in order to achieve, together, new challenging goals in terms of emission saving and reductions in the exploitation of the planet's resources. The total production of energy from renewable sources, carried out annually at our Faenza site, avoids emissions into the atmosphere of more than 80,000 tonnes of carbon dioxide of fossil origin.



Biomethane for automotive use

Bio LNG for heavy vehicles

Electricity

District heating

Liquefied CO<sub>2</sub>

Composted soil improvers



Leader in Italy for  
**recycling  
wastewater**  
agri-food companies



**1 truck of waste  
feeds 1 small car**  
for 1 year

Plant for the production of  
**advanced  
biomethane**

**production capacity**

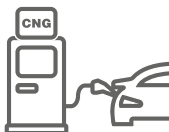
**12M Nm<sup>3</sup>**

corresponding  
to fuelling

**18,000**

**CARS FOR ONE YEAR**

(Small car, 1,400cc: 17 km with 1 cubic metre  
of methane, average mileage per year 11,200 km:  
source *Quattroruote*)



**Recycling  
of CO<sub>2</sub>**

discarded  
in the biomethane  
plant

Production capacity  
of recycling  
of carbon dioxide  
for **food use**

**7,000 t**

**OF LIQUEFIED CO<sub>2</sub> /YEAR**



Production of  
**BIO LNG**  
for fuelling  
heavy vehicles



**135,000 t**  
**FERTILIZERS**

**electricity  
equivalent to  
150 GWh**

in the form of:  
electrical energy  
thermal energy  
biomethane  
bioethanol



**emissions saving  
82,000 t  
of CO<sub>2</sub>**

Browse  
the Caviro Group  
Sustainability Report.





*Authors of the mural:  
Cristiano Marchetti aka Kry  
Alberto Manservigi aka Albeat*



[www.caviroextra.it](http://www.caviroextra.it)