

Sustainability Report

2022



SERENA
WINES 1881

Letters to Stakeholders

We are proud, as a family and a company, to present our second Sustainability Report. For years, we have constantly focused towards our territory, client and employees.

Serena Wines came about as a result of a long family tradition begun in 1881. We have gone a long way since then, investing to innovate our production technologies, bottling implants and both national and international distribution.

As of today, the company has grown and produces 26.000.000 0.75l bottles and 9.000.000 0.25l bottles, reaching a revenue of 104.000.000€, in 2022.

During the years, we have always focused on sustainability, trying to safeguard our territory, Conegliano, in the heart of the Prosecco area. We monitor the water consumption, production, waste disposal and the wellbeing of employees.

Through the years we have also initiated many collaboration projects with Universities and research centers to make our social environmental impact better, through initiatives that support charity and sport organizations.



Luca Serena

Chief Executive Officer

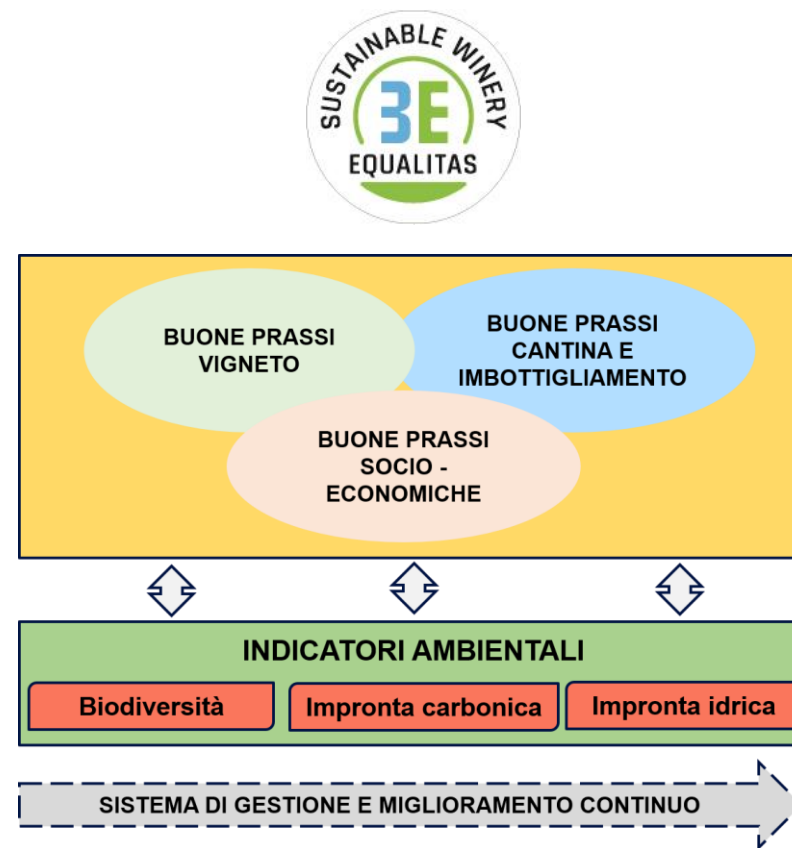
Sustainability



The methodology used

Sustainability is to be understood not as a state or an immutable vision, but rather as a continuous process, which recalls the need to combine the three fundamental and inseparable dimensions of development: Environmental, Economic and Social.

Serena Wines 1881 has embarked on a journey to sustainability following the standard EQUALITAS – ORGANIZATION revision 4 for company processes, from the production to processing up to bottling and sale of the finished product.



Internal Audits

Internal audits carried out in 2022 by Unione Italiana Vini's qualified personnel, showed no relevant nonconformities; all suggestions regarding the improvements have been taken over and solved promptly.

The certification body CSQA has carried out the first audit during the month of June 2022. 4 NCs and 5 observations were found and taken over and solved promptly.

In June of this year, has taken place the second annual audit where all requirements have been positively evaluated.

The company has now been certified for the second time with the V.4, following a gradual approach suggested by the standards, and planning on evaluating the indicators applicable as of next year.



Sustainable Goals

The 2030 Agenda for Sustainable Development, ratified in 2015 by the 193 Member States of the United Nations, is the set of 17 sustainable development goals to be achieved by 2030. The whole of global civil society, institutions, businesses, not for profit organizations, each in its own sphere of activity and possibilities for action, is called to make a concrete commitment to their implementation.

Serena Wines 1881 has developed a project related to sustainability, setting itself some goals for the sustainable development of the company. The Serena family is involving the entire company so that there is participation by all.






SUSTAINABLE DEVELOPMENT GOALS



Company goals:

TEMA AGENDA 2030	COMPANY GOALS	HIGHLIGHTS
 	Corporate development	<p>Exceeding of 100 million euros in turnover Increase in company staff</p>
 	Increased product and brand awareness	<p>Opening in April 2022 of a hospitality in the estate of Arfanta, with tasting experiences of Prosecco Serena and Champagne De Vilmont of which Serena is the owner of the brand</p>
 	Increase in sales	<p>Increased sales of: the One-Way drum of 13% the size 200/187 ml of 26</p>
  	Increasing the culture of quality	<p>In 2022, 17 new tests were carried out for the culture of quality, the average test score was 10 points out of a maximum of 11 available. The result is considered positive</p>
     	Development of sustainable business ethics	<p>In June the company obtained the Equalitas Certification. The code of ethics and the company policy were shared with customers, suppliers and employees</p>

Company goals:

TEMA AGENDA 2030	COMPANY GOALS	HIGHLIGHTS
	Reduction of company environmental impact	<p>Performed a revamping of the sewage plant, with consequent cancellation of the creation of waste from liquid sludge and decrease in electricity consumption</p> <p>Obtaining estimates for the implementation of a company photovoltaic system</p> <p>1% decrease in electricity consumption, compared to an increase in production (in hl) of 8%</p>
	Technological development to improve consumption monitoring	Improvement in the collection of data on consumption, through readings at a rate of 15 minutes of electricity and water consumption, and implementation of data processing protocols collected
	Company's digitalization	Provision made for the replacement of the previous software (Galileo) with an improved version (jgalileo) Software update for non-conformities
	Maintenance, updating of production lines, increased performance	<p>7.5% increase in keg production in hl</p> <p>20.5% increase in the production of bottles in hl</p>
	Optimisation of loading/ unloading flows	Structural and organizational modification of the external viability, insertion of 2 new load bays

The Company



Family tradition

The company

Serena Wines 1881 is a family business for 5 generations with a long tradition in wine production. Located in the heart of the Prosecco area, it produces over 35,000,000 bottles a year with a 50% export.

140 years



History

1881

Foundation

1985

Birth of Prosecco
Serena

1987

Launch of the wine
in keg

2003

New plant
in Conegliano
of 35,000 square
meters

2004

Internationalization
and entry into the company
by Luca Serena
(5th generation)

2021

140 anniversary
and launch Serena 1881

Values

Family

A family history that continues for 140 years, carrying on the tradition and respect for the land and its fruits.

Innovation

We are looking to the future. We use the most modern and spacious autoclaves for the Charmat method and state-of-the-art bottling systems.

Territory

We are located in the heart of the territory of Prosecco, where we cultivate the land in full respect of it.

Sustainability

For years we have been aware and respectful of the environment. We start projects to protect the territory with Institutes and University.

Transparency

Ethics, loyalty, fairness allow you to fear nothing, because you have nothing to hide.

Inclusivity

We believe in an inclusive and fair society and have therefore launched several projects in this direction.



In the heart of Prosecco

The company is located in Conegliano, in the heart of the area DOCG of the production of Prosecco.

Prosecco is a white wine with a registered designation of origin produced in Veneto and Friuli Venezia Giulia. It became known in the nineties of the twentieth century as Prosecco IGT (typical geographical indication), and in 2009 it obtained the denomination of controlled origin (DOC).

Some historical appellations of this wine have taken the DOCG brand (Prosecco di Conegliano-Valdobbiadene).

Prosecco is today the most exported Italian wine abroad and in 2014 it surpassed Champagne for the first time for the number of bottles sold in the world.

From 2019 the Prosecco Hills of Conegliano and Valdobbiadene are included in the list of UNESCO World Heritage Sites.



The Prosecco Hills: UNESCO World Heritage

Heritage

The Prosecco hills of Conegliano and Valdobbiadene were recognized as UNESCO World Heritage Sites in July 2019.

The site includes the hills that extend from the town of Valdobbiadene to that of Vittorio Veneto.

The territory that covers 19 thousand hectares includes 15 municipalities and is characterized by uneven reliefs and small valleys.

In this context arise the vines of the DOCG of Prosecco, that is the area of greatest value and in which our company has its production site and two estates for agricultural use and hospitality.



Plant

The current plant, created in 2003, lives on 38,500 m² of land, of which 20,000 m² are covered.

It is located in Via Camillo Bianchi 1, in Conegliano, inside the "Zona Industriale delle Prealpi Trevigiane".

It is bordered to the west by the 'Ponte nelle Alpi - Conegliano' railway;

to the north by the canal "Castelletto - Nervesa";

to the east from 'Via Camillo Bianchi', which uses as a point of access to the company for staff and for vehicles that load and unload goods every day in the outdoor area or in the 8 specific bays of cargo;

to the south from 'Via dei Prezzivali' which allows the exit of the vehicles, and to have a smooth and one-way path that conveys them along the perimeter of the company.

The wine jars of the company have a capacity of 80,000 hl, and are used for storing wine in its various stages of processing.

Autoclaves have a capacity of 40,000 hl



Our brands

SERENA

WINES 1881



Economic sustainability



Performance 2022



€ 104.000.000

Revenues



35.000.000

Bottles produced



93

Employees

1.137.700€
INVESTED IN 2022

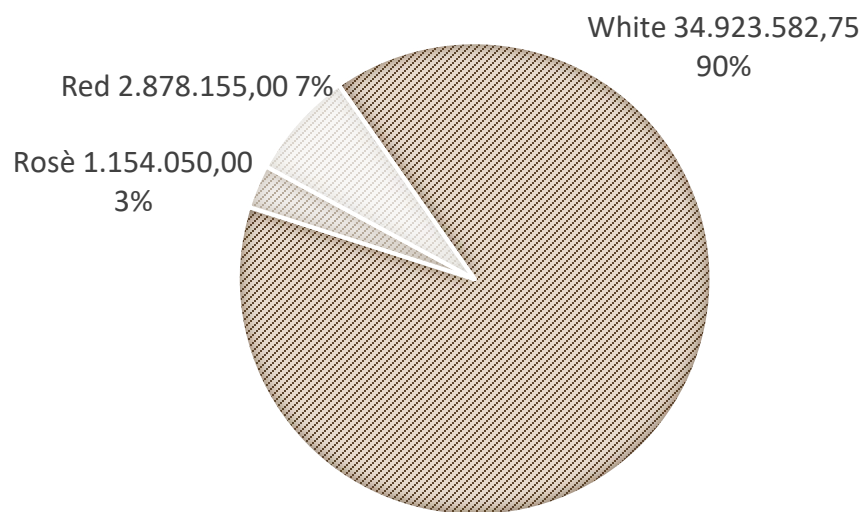


Wine bough

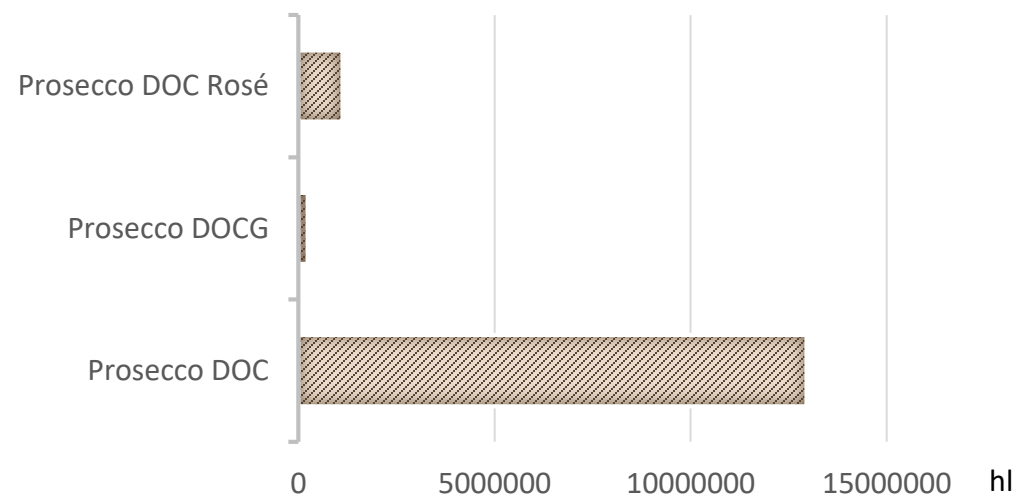
In 2022 39,000,000 litres of wine were purchased, divided into different qualities, which for convenience we summarize in the macro categories: White, Red and Rosé. 43% of the volume of wine is related to PDO wines, 8.5% is related to PGI wines (3,250,000 l).

Within the family of white wines stands out Prosecco, for years the main product of the company, which is perfectly suited for the fermentation process with the Charmat method. In 2022, the company purchased 16,400,000 litres of Prosecco wine, divided as follows: 12,950,000 Prosecco DOC, 2,330,000 Prosecco DOCG and 1,120,000 Prosecco DOC Rosé.

LITRES OF TOTAL WINE PURCHASED
(2022)



LITERS OF WINE PURCHASED "ACT TO PROSECCO"

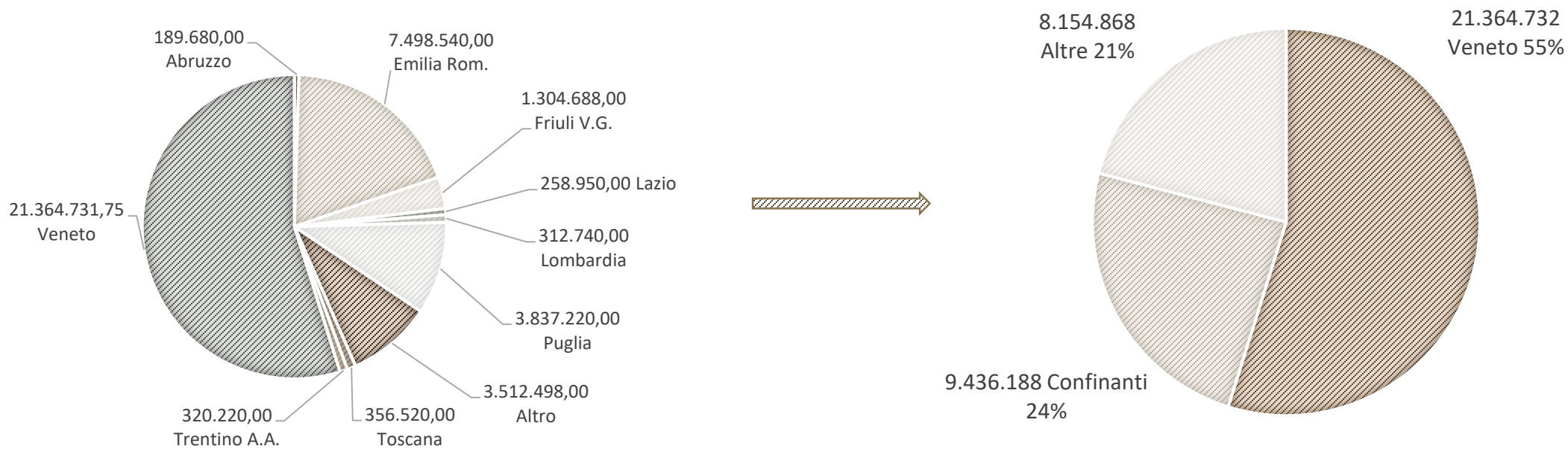


Wine suppliers

The relationship with our wine suppliers is the result of many years of meticulous work aimed at the selection phase. The Serena Family has always dedicated, in person, a lot of passion and expertise to this fundamental activity. The origin of the suppliers is almost exclusively from areas adjacent to our factory in Conegliano, this to privilege the characteristics of the wines of the area and to give continuity to the human relationship created over the years with our suppliers in the Veneto, Friuli Venezia Giulia, Emilia Romagna, Lombardy and Trentino.

The left graph shows the percentage of wine purchased according to the regions of origin while in the right graph we compared the origin of the wine from the neighboring regions (Veneto, Emilia Rom., Friuli V.G., Lombardy and Trentino A.A.) than from distant regions. The company has always wanted to maintain the relationship with the territory and its agricultural community and it also does so by favouring suppliers in the area.

LITERS OF WINE PURCHASED IN THE YEAR FROM VARIOUS REGIONS

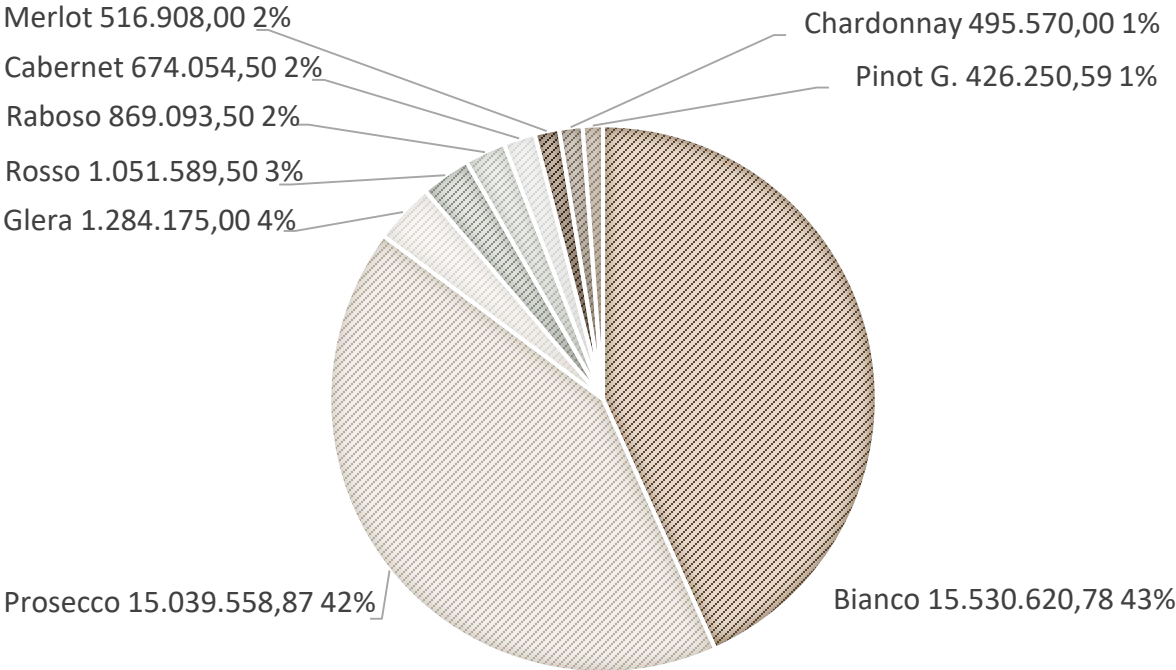


Bottled wine

Serena Wines 1881 today holds the National record in the production of stainless steel barrels, with this format has distinguished itself over the years on the Italian territory and not. The great entrepreneurial capacity of the Serena Family has allowed this prestigious record to be flanked by a leading role in the production of bottles, with particular emphasis on sparkling and semi-sparkling wines.

The great rise on the market of Prosecco DOC and DOCG was decisive to satisfy this great aspiration. Below are some data on the main wines that in 2022 the Company has packaged.

LITRES OF WINE OF THE MAIN PACKAGED NAMES



Bottles

Serena Wines focuses mainly on three bottle formats for its production:

- Classic from 0.75 cl
- Magnum of 1,5 lt
- Small from 0.2 cl

Thanks to the large production capacity, efficiency and business organization,

Serena Wines ranks among the first producers of Prosecco.



0,75 lt

26.000.000 bottles



1,5 lt

50.500 bottles



0.2 lt

9.000.000 bottles

Kegs & Bag in box

The Serena brand, the company's first real product brand, is synonymous with innovation: since 1987 it has been distributing wines in cask all over the world.

The drums are very large steel containers or the most practical PET.

Serena barrels are the answer to keep the quality and characteristics of the wine longer because they protect it from light and oxidation during transport and maintain its characteristics and temperature during service.

Choosing Serena drums means making an innovative choice, ONE WAY KEG for example is the first PET barrel 100% recyclable, durable practical and handy. A real revolution in practicality but with the guarantee of the quality of a Serena product.

In addition to the drums, the company is also developing its market position in the box bag segment.



Kegs

565.000



Bag in box

25.500

Bulk wine

Serena Wines 1881 also sells bulk wine transported by trucks or small tanks of 5, 10 and 15 hectoliters that are easier to transport. In 2022 the bulk wine sold was about 4,500 hectoliters.



4.500 HI



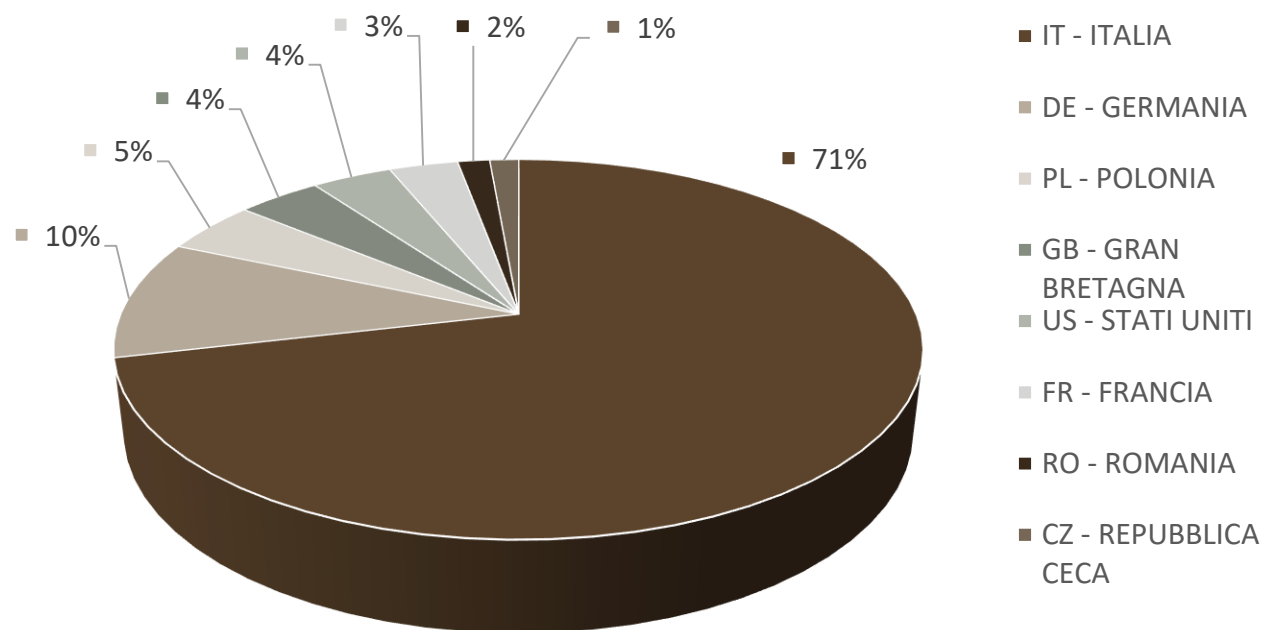
Sales

Since the early 2000s the Company has started a physiological and forward-looking process of sales expansion outside the national borders. However, this new mission has not adversely affected sales in Italy, where it has historically distinguished itself in the Ho.re.Ca..

In 2022 production was allocated 50% to domestic consumption and 50% to foreign consumption.

The products that crossed the National borders in 2022 reached 50 different countries, in the graph on the right we summarize only those where we export a volumetric value of wine greater than 1%.

HL sold in different countries



Sustainable production



Quality control

Serena Wines 1881 has been certified BRCGS, IFS Food, Organic Wines, veganok, SEDEX, SAFE WORK and now also Equalitas.

In addition to this, to ensure every day the absolute quality of wines to our consumers, frequent and targeted controls are necessary throughout the supply chain.

For this reason every year we carry out:

- More than 6,500 analyses carried out including more than 2,900 on the finished product
- 20 to 40 daily seasonal analyses
- 360 analyses in 3 different accredited laboratories
- Ring test (control of the methods of analysis through comparisons with external laboratories) passed regularly

Quality control



Quality control

Our current checks are performed in:

Arrival:

- Wine
- Oenological products
- Dry material (e.g. bottles, caps, cartons, etc.)



For incoming material, including wine, there are 17 control parameters. These can be made according to the supplier with different frequencies according to the company HACCP plan.

Processing of the product:

- Dry matter quality control (e.g. bottles, caps)
- Analytical and sensory controls of wine



The processes follow the product plans: different analytical checks are carried out for the various types of wine. For a mass of sparkling wine 15 analytical measurements are made at the different stages of processing and the organoleptic/sensorial conditions are checked in 10 moments.
- The packaging phase is also monitored through the product plans. In one of our bottling plants, 35 operational, cleaning and packaging conformity checks are carried out. Some of these have an hourly frequency and are recorded through special modules.

Shipments:

- Control of final product conformity
- Packaging controls finished product



During the shipment of goods operators are required to check the conformity of the means, visually the load and the correct positioning.

Supplier evaluation

Evaluating a supplier is for us a very important point of the organization, the evaluation method allows us to select the most reliable partners in terms of product quality, reliability and now also close to us on sustainability issues.

The company has a total of 197 suppliers including wine, services and dry materials (caps, bottles, cardboard, labels, etc.).

Each of these had to pass our qualification process and the result showed that:

- 96% qualified
- 4% qualified with reservation

The company has therefore decided to share, in particular with the latter, its values of sustainability to raise awareness of these issues

We are pleased to note that 15 sustainability certifications have been achieved among our suppliers

Purchased dry matter for packaging

In 2022, the company purchased for its production respectively:

- 94.5 million labels,
- 4.5 million sales cartons,
- 40 thousand other cartons,
- 28.5 million capsules per bottle,
- 500 thousand capsules for stems,
- 36.8 million caps,
- 22.3 million cages,
- 35.8 million bottles average weight of 514g single bottle.





Use of marble material based on the prestigious sparkling wine line «Ville d'Arfanta»

In the process of evaluating the materials to be used in production, we started to consider sustainability. If possible, we look for materials with low environmental impact, from certified suppliers and that have an eye on sustainability issues.

For a couple of years we have converted the materials used in the labels of our most prestigious brand «Ville d'Arfanta», introducing a compound coming from the concepts of circular economy composed of waste from marble and polyethylene mining.



MARBLE BASE

È un sintetico che offre un approccio radicalmente diverso ai materiali sostenibili.

CARATTERISTICHE PRINCIPALI

- › Contiene l'**80% carbonato di calcio** (scarti di estrazione mineraria del marmo) e **polietilene fino al 20%**
- › Per la sua produzione non vengono abbattuti alberi, né sprecata acqua
- › Può anche essere riciclato nelle materie plastiche o bruciato per produrre energia
- › Ha un ottimo punto di bianco, pur senza l'utilizzo di candeggina e sostanze tossiche
- › Marble Base è **più sostenibile delle carte riciclate**. Quest'ultime per la loro produzione richiedono molta acqua, candeggina e altri prodotti chimici, oltre a richiedere tra il 67 e l'82% di energia in più rispetto alla Marble Base.

IL PROCESSO PRODUTTIVO IN SINTESI



2023 Per informazioni



Sedex Member



Environmental sustainability



Good cellar and bottling practices: Product plans

The product plans are important documents because they describe in detail the various steps of the production chain. It starts from the drafting of the flow-chart of a product and for each phase of the diagram it is defined: what you control of the wine and what you control of the process. Recently we added a particular section where it is indicated what kind of waste is produced in the phase and the amount of water consumed.

Phase position compared to the flow chart

What you control of wine

What you control in the process

What can be done in the process

FASE		3) FILTRAZIONE TANGENZIALE				
MODALITA' DI CONTROLLO	FREQUENZA	RESPONSABILE	DOC	MO		
SPECIFICHE DI PRODOTTO						
IGIENICO SANITARI						
QUALITA'						
ORGANOLETTICI	Organolettica	Ogni vasca	ENOL		MO88	
SPECIFICHE DI CONTROLLO						
PRESSIONE DI ESERCIZIO FILTRO	Strumentale	Continua	OP	Log sistema	MO 02	
PORTATA	Strumentale	Continua	OP	Log sistema	MO 02	
LIMPIDEZZA	Visiva	1 al giorno	LAB	Log sistema	MO 02	
SPECIFICHE DI PROCESSO						
AGGIUNTA/DOSAGGIO ADDITIVI COADIUVANTI			ENOL		MO 02	
RIFIUTI DI PRODUZIONE CONSUMO H₂O, N₂	UTILIZZO	FREQUENZA	RESPONSABILE	DOC	MO	
ACQUA	50 hl	1 volta al giorno	OP	IO 16		
	90 hl	1 volta settimana	OP	IO16		
IMBALLAGGI MISTI (CER 150106)	In base alle necessità, 100g	1 volta settimana	OP			
CARTA (CER 150101)	In base alle necessità, 100g	1 volta settimana	OP			

Method, frequency, responsibility and documentation for each check

- Monitoring and quantification of waste produced per phase
- Monitoring of water used

Monitoring and consumption

One activity in which the Company is paying a lot of attention is monitoring, this is because we are deeply convinced that being in possession of a precise and accurate data is then a source of a fair change.

We started our activity paying close attention to these quantities to monitor:

- Consumption of oenological products (every day we record the consumption of individual oenological products ensuring their traceability within all bottled products),
- Water consumption (through the reading of bills and a series of meters placed along the company network you can evaluate the daily consumption of water),
- Electricity consumption (interpolating the data of the bills with those of the production),
- GAS consumption (through the reading of the general meter and the data reported in the bill),
- Monitoring of waste production (waste register data and annual MUD),
- Vehicles in departure and arrival of raw materials.

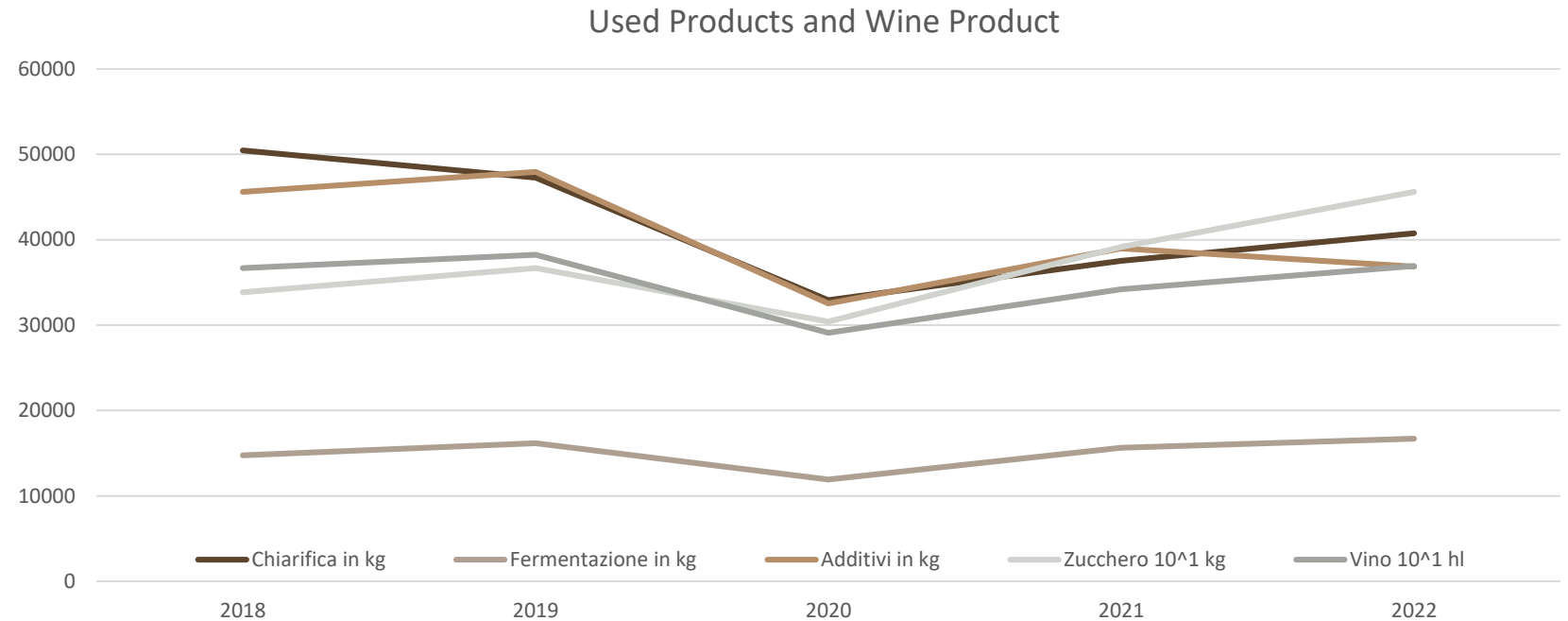


FRAGILE



Monitoring of oenological products

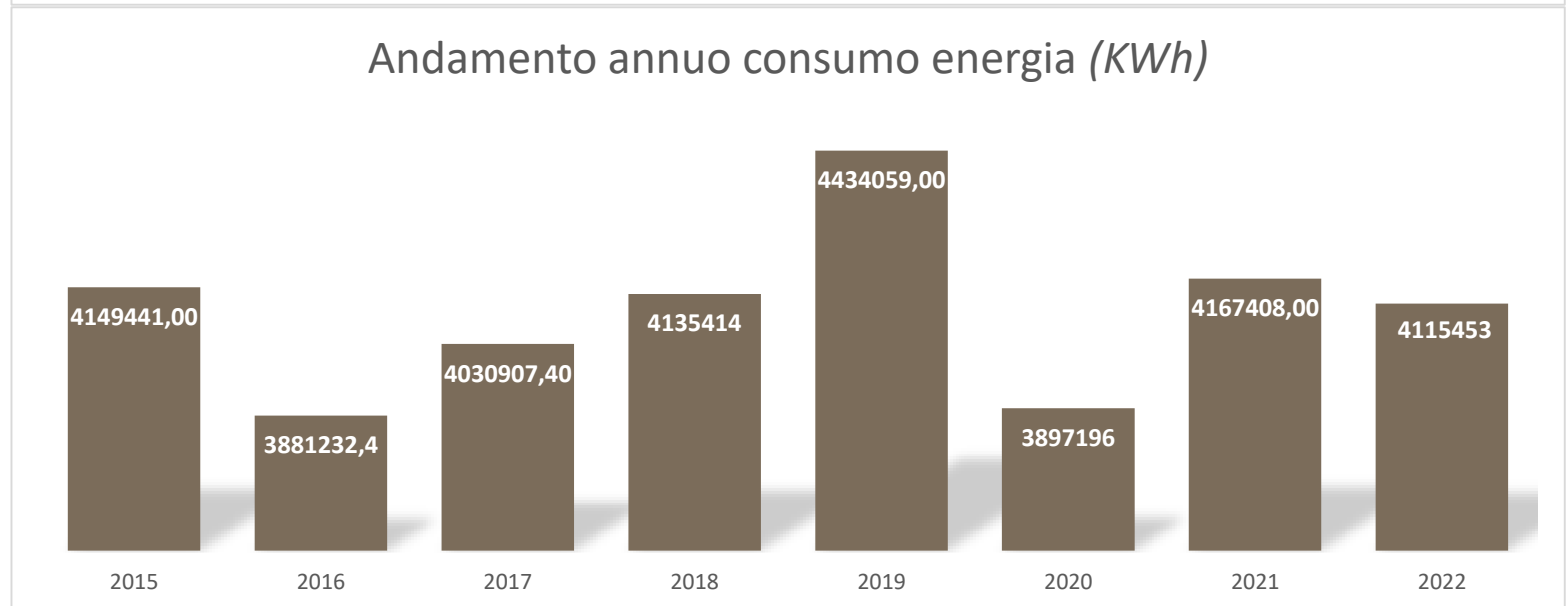
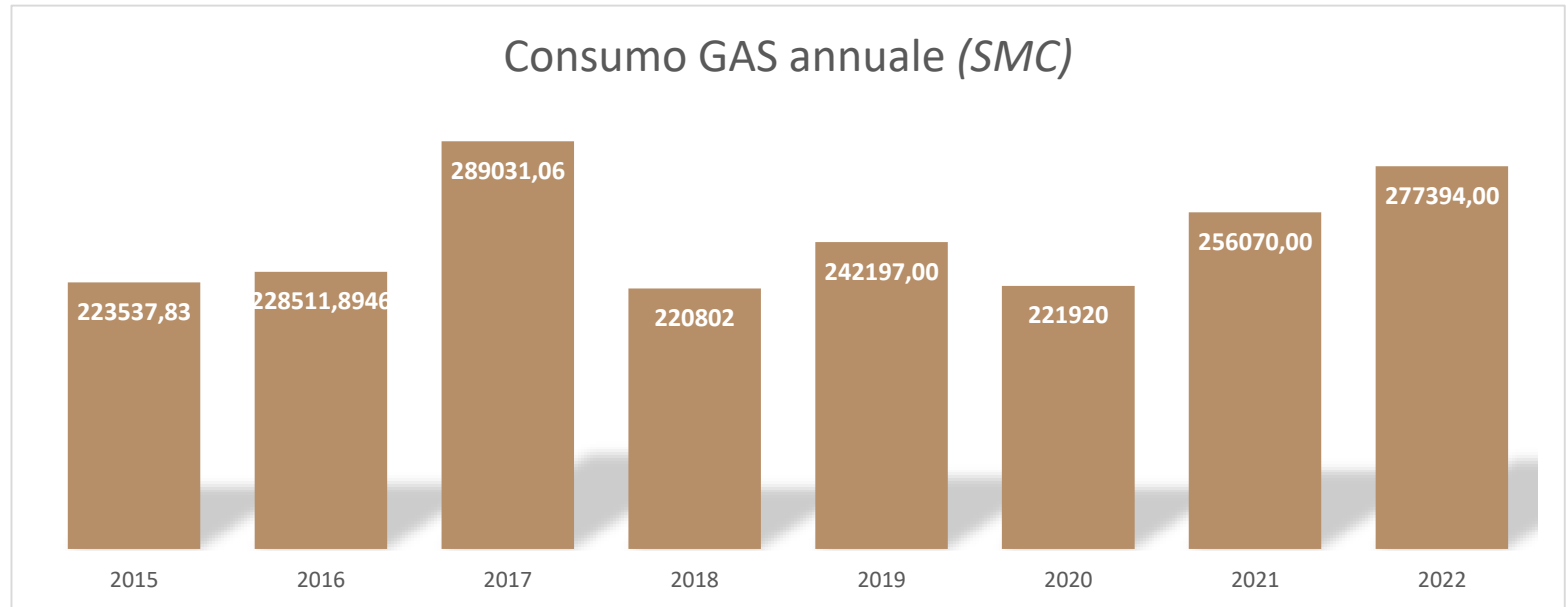
The trend of wine products over the years is constant and proportional to production. In 2022 we committed to using fewer additives while maintaining the same quality as the finished product



Monitoring consumption

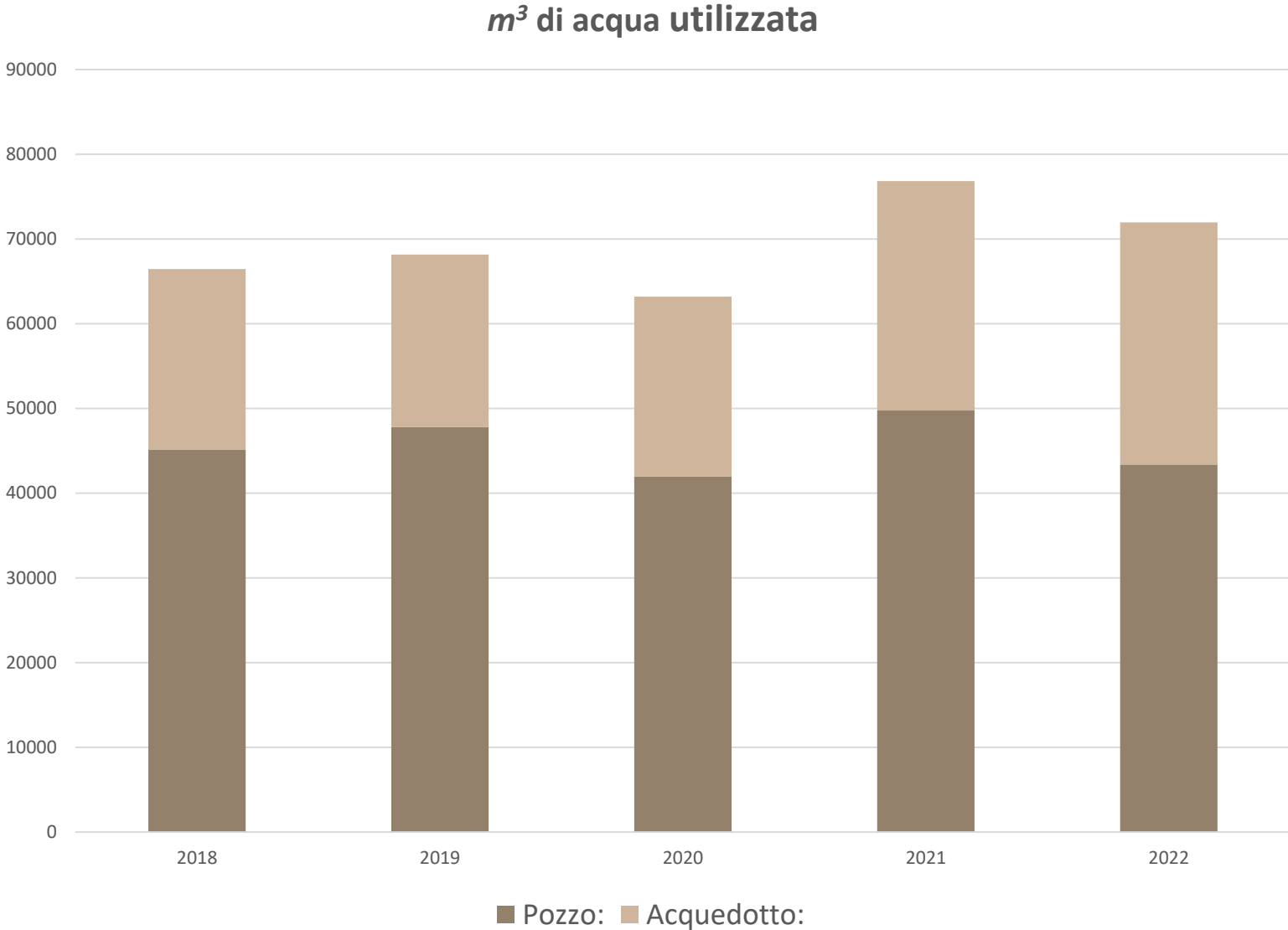
We constantly monitor business consumption both directly and related to production.

Our commitment is to limit consumption and make the production process more efficient



Consumption monitoring

We can say that the policy of raising awareness of staff, carried out during the year, has led to excellent results with a 6% decrease in water consumption compared to 2022, a trend that the company aims to confirm in 2023.



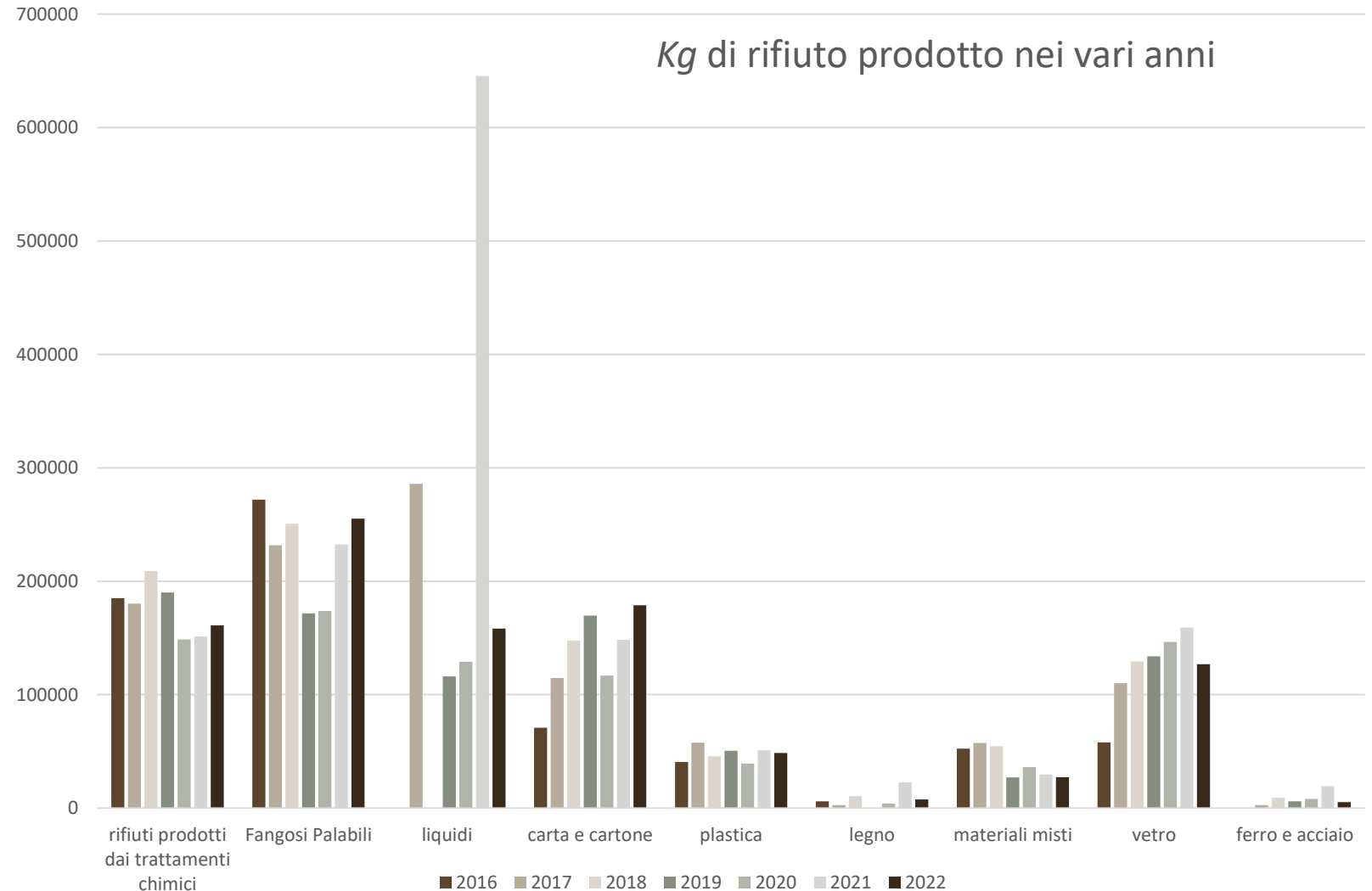
Waste monitoring

Waste is constantly monitored and recorded.

Thanks to an optimization of the external warehouse and with an important structural modification also of the practicability.

The company has succeeded in reducing the creation of glass waste, from 1.02% in 2021, of the one used in production (159.000kg), to 0.69% (127.010kg).

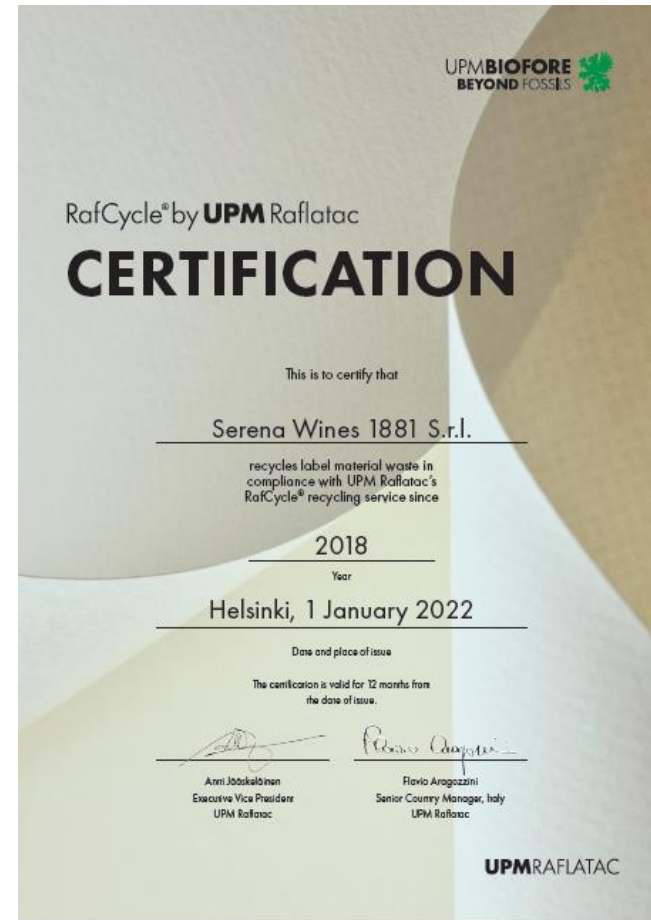
Equal to 2 trucks in less than bottles



RafCycle certification

Since 2018 we have joined the RafCycle Circular Economy project, owned by UPM Raflatac. We collect the waste from self-adhesive labels at the packaging lines, which are no longer sent to landfill (as mixed packaging) but recycled at the UPM group paper mills for the production of new label paper.

We found very interesting the activity to reduce the environmental impact of our bottling activity, but also from an ethical point of view and to improve waste management.





Social sustainability



Employees

Serena Wines 1881 is a family business that believes in enhancing its employees through stable contracts, for more than 95% indefinitely and a dedicated company welfare.

Gender equality is a theme felt and in fact the workers present in the offices are divided by 54% in women and 46% in men, while in the production department we find the totality of men, motivated by the type of work.

Total employees

	2022
Collaboratori	93

Employees by gender

	2022	%
Donne	24	24%
Uomini	69	76%

Employees by age

	2022	%
Under 30	14	15%
30 - 40	22	24%
40 - 50	29	31%
Over 50	28	30%

Contract type

	2022	%
Indeterminato	90	97%
Determinato	3	3%
Di cui:		
Apprendistato	1	1%
Part time	2	2%

Neighborhood and territory

The company is located in an industrial area located between the municipality of Conegliano and Vittorio Veneto, bordered mostly with agricultural land cultivated with vineyards, other industrial realities and a private kindergarten. We carried out a survey, through the delivery of a questionnaire, to evaluate how Serena Wines 1881 is perceived and to collect important ideas for improvement.

The answers showed that our company has no significant impact on surrounding realities and that it positively influences the community in which it is inserted.

Regarding the environmental issue, the company is not considered as having a strong impact. Both social and environmental certification has been appreciated by the neighbourhood.



Research projects

16 | IL CORRIERE VINICOLO N.5
10 Febbraio 2020

ECONOMIA CIRCOLARE

SINERGIE
TRÀ MONDO
DELLA RICERCA
E AZIENDE
PRIVATE



di CLEMENTINA FALESE

Dopo il brevetto per estrarre dalle fecce i coloranti organici da impiegare per costruire celle fotovoltaiche che convertono l'energia solare in energia elettrica, il passo successivo vede Serena Wines e Università Ca' Foscari impegnate in un progetto biennale con l'obiettivo di prototipare ed eventualmente portare sul mercato questa tecnologia

Dalle fecce di vinificazione nascerà energia elettrica

La collaborazione tra enti di ricerca pubblici e aziende private può essere rapidamente al centro di un metodo per estrarre dalle fecce dei vini rossi e bianchi i coloranti da impiegare poi per costruire celle fotovoltaiche che convertono l'energia solare in energia elettrica. Visti gli importanti risultati raggiunti in poco tempo, lo scorso autunno Ca' Foscari e Serena Wines 1881 hanno siglato un accordo per sviluppare, nei laboratori di ricerca del Campus Scientifico Cabocardino, celle fotovoltaiche di nuova generazione. Dopo aver acquisito la piena titolarità del brevetto, Serena Wines 1881 ha inoltre sottoscritto un importante progetto di ricerca della durata di 2 anni con l'Università Ca' Foscari Venezia, investendo circa 500 mila euro, con l'obiettivo di prototipare ed

eventualmente portare sul mercato questo tipo di tecnologia. **Le fasi del progetto** "Con la professoressa Elisa Moretti e il suo team di ricerca - racconta Stefano Meneghetti, responsabile della qualità di Serena Wines 1881 - circa un anno e mezzo fa abbiamo cominciato a lavorare su un'idea per dare nuove destinazioni, mai pensate prima, agli scarti di vinificazione e in particolare alle fecce di vini rossi, ricche di coloranti organici, normalmente destinate al recupero dell'acido tartarico, di conservanti per l'industria alimentare, nutraceutici, cosmetici ecc. Nessuno prima aveva utilizzato questo scarto di lavorazione per realizzare celle fotovoltaiche. Visti i risultati positivi ottenuti

In the three-year period 2018-2020 Serena Wines 1881 funded and participated in a research project with the Ca' Foscari University of Venice to develop photovoltaic cells with organic dye that use the waste of the wine supply chain.

Sviluppo di Celle fotovoltaiche a base di scarti della lavorazione del vino per la produzione di Energia Rinnovabile e Sostenibile - CHEERS -

Elisa Moretti¹, Manuel Meneghetti², Aldo Talon³, Emilio Celotti³, Enrique Rodríguez-Castellón³, Stefano Meneghetti⁴

Abstract

Una delle fasi più importanti di un processo di produzione di energia rinnovabile è la gestione dei rifiuti. In questo senso, la ricerca e lo sviluppo di nuove tecnologie che consentano di sfruttare i rifiuti per produrre energia elettrica rinnovabile è un obiettivo fondamentale. Questo lavoro si è focalizzato sulla produzione di celle fotovoltaiche a base di scarti della lavorazione del vino, in particolare sulle fecce di vini rossi, ricche di coloranti organici, normalmente destinate al recupero dell'acido tartarico, di conservanti per l'industria alimentare, nutraceutici, cosmetici ecc. Nessuno prima aveva utilizzato questo scarto di lavorazione per realizzare celle fotovoltaiche. Visti i risultati positivi ottenuti

Descrizione attività

- 1. Una cella a base di silicio è un tipo di pannello fotovoltaico che converte l'energia solare in elettricità.
- 2. Una cella a base di silicio è un tipo di pannello fotovoltaico che converte l'energia solare in elettricità.
- 3. Una cella a base di silicio è un tipo di pannello fotovoltaico che converte l'energia solare in elettricità.

Risultati & Impatto

- Risultati estremamente promettenti, paragonabili con i valori riportati nella letteratura scientifica internazionale delle celle DSSC realizzate utilizzando estratti di origine vegetale.
- Deposito internazionale dell'invenzione in co-titolari: Talon e Falcato/Università Ca' Foscari Venezia/1881 - Procedimento per la realizzazione di celle fotovoltaiche a base di scarti di vinificazione (17 Maggio 2019).
- Acquisto del brevetto da parte dell'azienda partner Serena Wines 1881 (16 Maggio 2019).
- Finanziamento biennale (330.000 €) da parte dell'azienda partner al gruppo di ricerca catodarica per lo sviluppo del brevetto (2019-2020).
- Ampio attività di disseminazione dei risultati ottenuti: con partecipazione a eventi e convegni internazionali (Venezia 2019, EuroFood 2019) e notevole presenza a livello nazionale con decine di articoli su quotidiani, notizie cartacee e online del settore scientifico, energetico e viticolo, numerosi radiofonici.

Numero assegni	Area tematica	Tipologia progetto	Totale finanziamento
1	Smart AgriFood	Interregionale/Transnazionale	41.056,83 €

applied sciences

MDPI

Sustainable Organic Dyes from Winemaking Lees for Photoelectrochemical Dye-Sensitized Solar Cells

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Abstract: During the last two decades, Dye Sensitized Solar Cells (DSSCs) have received a great deal of attention as a promising, low-cost alternative to conventional silicon photovoltaic devices. Natural dye molecules can be used as a sensitizer for their low cost, good light absorbance, easy preparation process, and biodegradability. In this study, dyes were obtained from wine lees, the last by-product of winemaking process, supplied by a venetian winery (Italy). Polyphenols, like tannins and anthocyanins, which were extracted from winemaking lees, were adsorbed on a nanostructured ordered mesoporous titanium dioxide, previously treated at different temperatures (400–600 °C). Both dyes and titania semiconductor samples were studied with different techniques. The tests were carried out on prototypes to evaluate the cell power and the photocurrent generated under simulated solar light irradiation. The obtained solar energy conversion efficiencies are comparable to those that were reported in literature by using organic dyes extracted from vegetables, fruits, and plants. It is significant that these dyes are largely available and cost effective, since recovered from a waste otherwise to be disposed of, opening up a perspective of feasibility for inexpensive and environmentally friendly dye solar cells to generate green electricity and transforming agri-food waste into a resource.

Keywords: DSSCs; organic dyes; winemaking lees; titania nanoparticles; circular economy

1. Introduction

Global energy consumption is mainly based on non-renewable resources and the increasing energy demand has pushed research on more sustainable and renewable resources [1]. Photovoltaic solar cells are unanimously considered to be very promising for clean energy production, but production costs, material availability, and toxicity sometimes hinder their deployment. An alternative to conventional cells for their much lower environmental impact and production costs are Dye Sensitized Solar Cells (DSSCs), introduced to the world in 1991 by Grätzel and O'Regan [2]. Unlike silicon solar cells, DSSCs charge generation and transport does not happen in a single material, but is split in different layers: a counter-electrode, an electrolyte solution, a sensitizing dye, a nanostructured semiconductor, generally titanium dioxide, and finally, a conductive glass.

One of the most important cells' elements is the dye that is adsorbed on titanium dioxide layer, playing a fundamental role in DSSCs because it is involved in the harvesting and conversion of solar

A new wine: Bianco Spumante Soè

Due to market demands, in October 2022, the sales department proposed the production of a new white sparkling wine.

Our oenologists and the design and development team immediately set about organizing organoleptic tasting of various blends and opted for a cut of Ribolla Gialla IGT Venezia Giulia (51%) and Chardonnay varietale (49%) both from the 2022 vintage.

The sparkling wine is straw yellow with greenish reflections and persistent foam. The perlage is fine and lively. The cut is well balanced, with notes of yellow fruit and some hints of citrus and white flowers. The taste has good acidity and flavor. As for the residual sugar at the end of the foam, it was decided for a 10 g/l because the base chosen will give life to a sparkling wine that finds its right balance.

Marketing in collaboration with the design and development team have designed the packaging of the product, arriving at the version that you see in the picture. The careful research of materials wants to convey to the consumer elegance and innovation, the distinctive feature of the company.

The first production was in February 2023, before the most important trade fairs held in the spring.



SERENA
WINES 1881



SERENA
PROSECCO
DOC TREVISO
BRUT NATURAL

SERENA

Objective 3: A project by Alex Zanardi

50,000 bottles of Prosecco Doc Treviso extra dry millesimato and Prosecco Doc Rosé brut millesimato specially created to fulfill a special mission: to support the Objective3 initiative, the exciting project conceived in 2017 by Alex Zanardi to bring together accompanying and supporting disabled people by introducing them to sport.

By becoming part of the community, athletes receive the equipment on loan for free use, and, in addition to the competence of the coaches, find in the new companions important points of reference to cultivate this passion. In its first four years of activity Objective3 has recruited more than 120 athletes, who participated in dozens of national and international events, achieving remarkable results, one above all: the bronze medal won by the paracyclist Katia Aere at the Tokyo Paralympics.

Objective 3 aims to spread the importance of sport for disabled people and for this reason has also devised a series of initiatives, the most important of which is the relay Objective Tricolor.



Joining the *Joint Transport* project



Sport Sponsorship

For several years we support the sports teams of our territory, the main ones are:

- Imoco Volley (6 times Italian Champion, 5 times Italian Cup winner, 6 Italian Super Cups, 1 Champions League and 2 Club World Cup)
- Treviso Basketball (1 Italian Cup)
- Hockey Cortina (17 league titles, 3 Italian Cups and 2 Alpine Cups)

We also support many other smaller sports



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