

Vinolok carbon footprint

2022



BOHEMIAN CRYSTAL TOP



Ambition

Our commitment to sustainability drives all parts of the glass production and delivery.

We understand the impact of our operations in the planet that is why we are committed to be an environmentally responsible company. As such, our company carried out an assessment to quantify the greenhouse gas (GHG) emissions associated to the life cycle of our Classic Low-Top Clear Glass Closure in order to:

1

Understand the contribution of each production phase whenever possible, compared to the total Carbon Footprint, to identify most relevant areas;

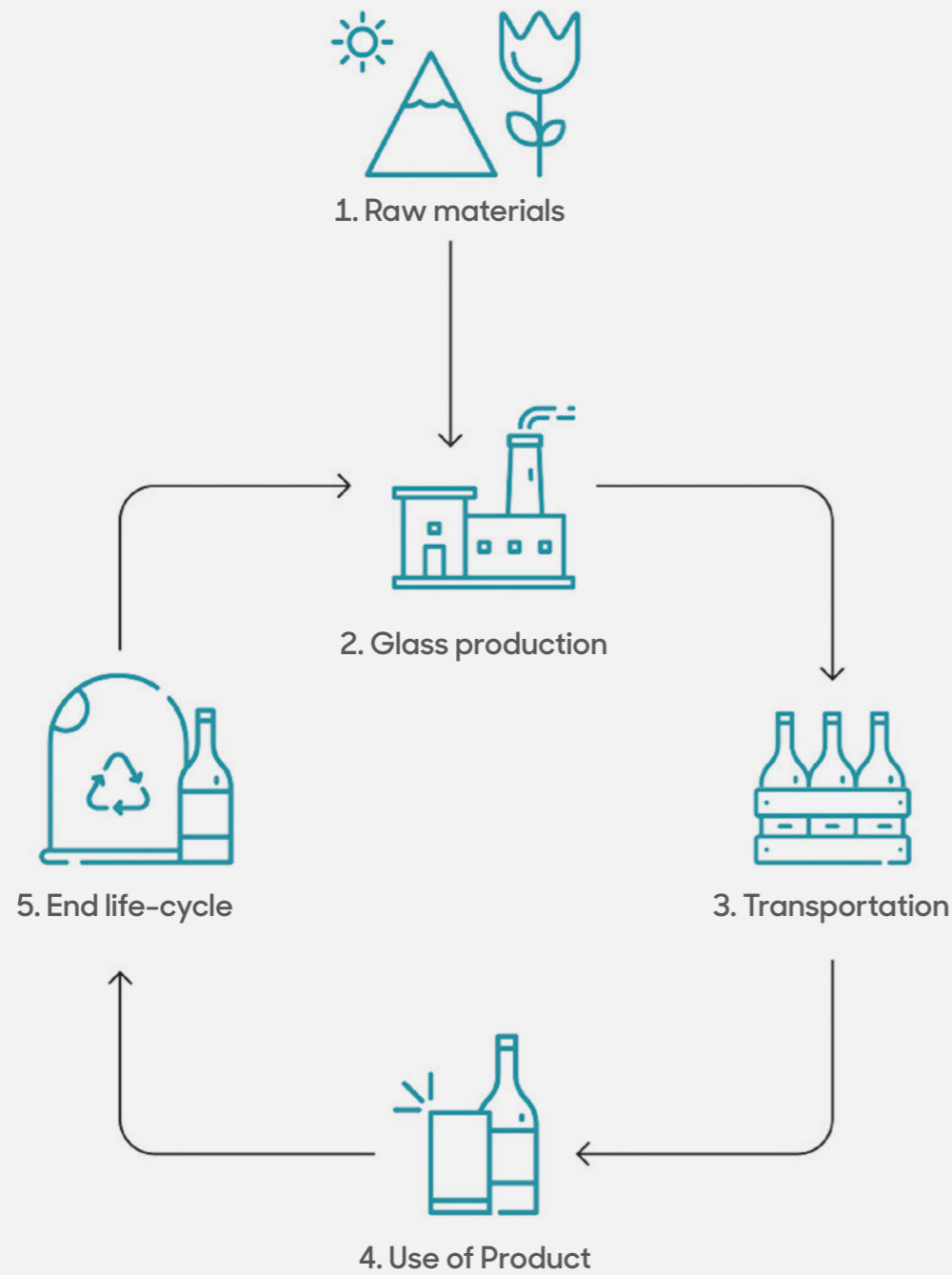
2

Identify opportunities to improve the environmental performance of our glass closure;

3

Enable future measurements and quantifications resulting from changes and improvements

Cradle to grave approach



The methodology used was life cycle analysis (LCA) based, supported by collected data from operational units, and from bibliographic sources. A **Cradle to Grave** approach was adopted, meaning that the carbon footprint was calculated based on the complete life cycle of the product, from the purchased raw materials, production process, distribution, consumption, until its end-of-life stage.

The carbon footprint presented in this report was developed according to the guidelines of Greenhouse Gas Protocol (GHG), developed by the World Business Council for Sustainable Development and the World Resources Institute.

Did you know?

Glass is made by heating limestone, sand and soda ash to 1500 °C. This heat comes typically from natural gas, and it accounts for between 75% and 85% of the carbon emissions from glass manufacturing.

Melting is the most energy-intensive step in the glass production process.

Some of the raw materials can be replaced with crushed recycled glass, known as cullet. When cullet is melted, no CO₂ is released.



1500°C
1400
1300

Carbon-free manufacture



Worldwide, glass manufacturing produces at least 86 million tones of carbon dioxide every year. But most of this can be eliminated when glass is recycled, and existing technologies could turn glass manufacturing into a mostly carbon-free process.

The glass-container industry has set itself a target of collecting 90% of all waste container glass in the EU by 2030.

Glass is an essential material. It is possible for its manufacture to become almost carbon-free in a relatively short time.

If the electricity source were fully decarbonized, it would mean that the entire process of glass-making would effectively be carbon-free.

Responsible sourcing

Vinolok glass closure
is made from the best
raw materials mainly
from local sources.

At the same time production takes place in northern Bohemia. Mining of glass sand, glass melting and pressing takes place **locally within 40 km** from the company headquarters. The company is responsible while sourcing all needed material for the overall production.

Natural materials

Glass is made from natural materials. The main component is quartz sand (70 %). Vinolok sources quartz sand of **outstanding quality** in the North Bohemia region. Soda (14 %) lowers the melting point of the quartz sand (from 2000°C), while lime and dolomite (14 %) give the glass hardness, shine and durability. It also contains refining agents.



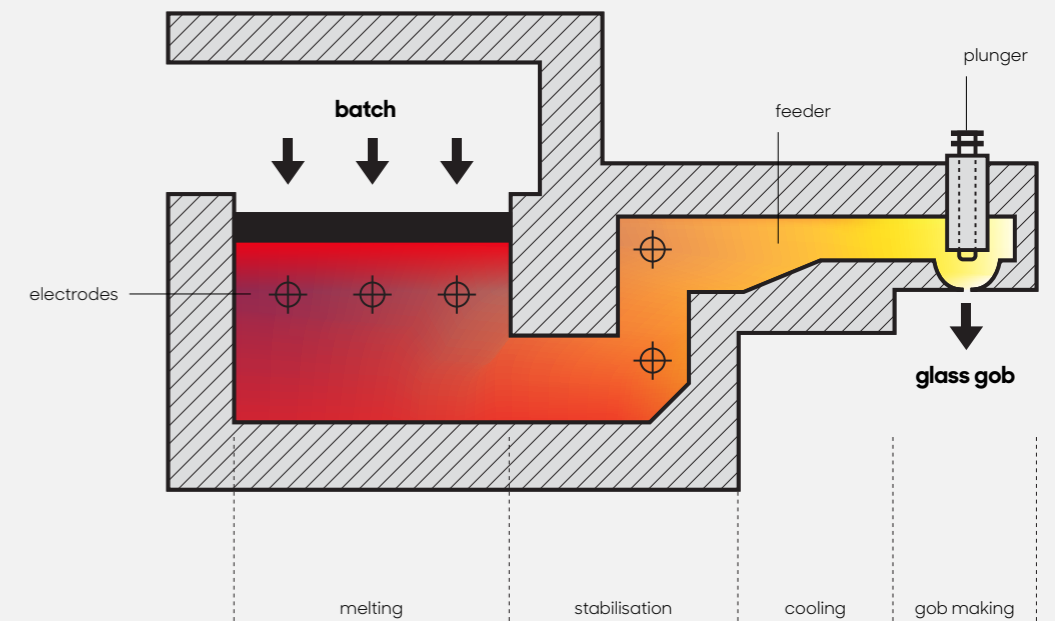
Melting process

At Vinolok we use the
most efficient electric
glass melting.

This method does not pollute the immediate surroundings of the production plant with fumes, as there is **very little direct emission** of combustion products and dust.

Preparation of the batch

Preparing the right mixture is essential to maintain 100 % glass quality. We only buy certified materials and verify their quality. That is why we **regularly perform chemical analysis** of our glass. There are automatic mixers in our plant that ensure accurate dosing of each component and help us prepare a batch with minimal variation of the components of the mixture. The whole batch is completed by adding cullets to the mixture which facilitates the melting process, is **less energy intensive** and chemically more stable. The amount of cullet is constantly checked and optimized by our technologists. We also have a sophisticated system for marking individual containers using codes and colours in order to deliver the right batch to the right furnace.



GHG emissions



Direct GHG Emissions

SCOPE 1

Scope 1 GHG emissions are direct emissions controlled by the organization, resulting from its activities.

Vinolok:
Emissions from fuel
consumption
(natural gas)



Indirect GHG Emissions

SCOPE 2

Scope 2 GHG emissions are indirect emissions not controlled by the organization. Emissions are related to the acquisition of indirect energy (e.g. electricity, annealing/heating).

Vinolok:
Emissions from the
generation of purchased
electricity



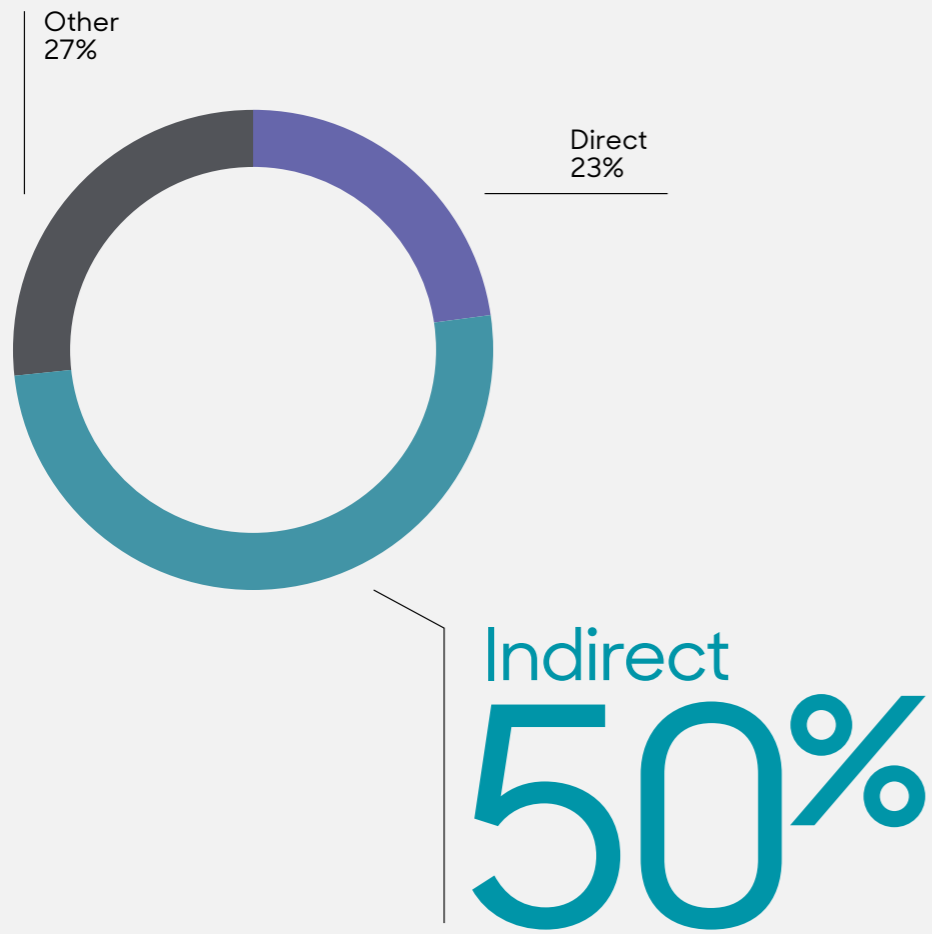
Other indirect GHG Emissions

SCOPE 3

Scope 3 GHG emissions are other indirect emissions and are generated in the value chain (upstream and downstream).

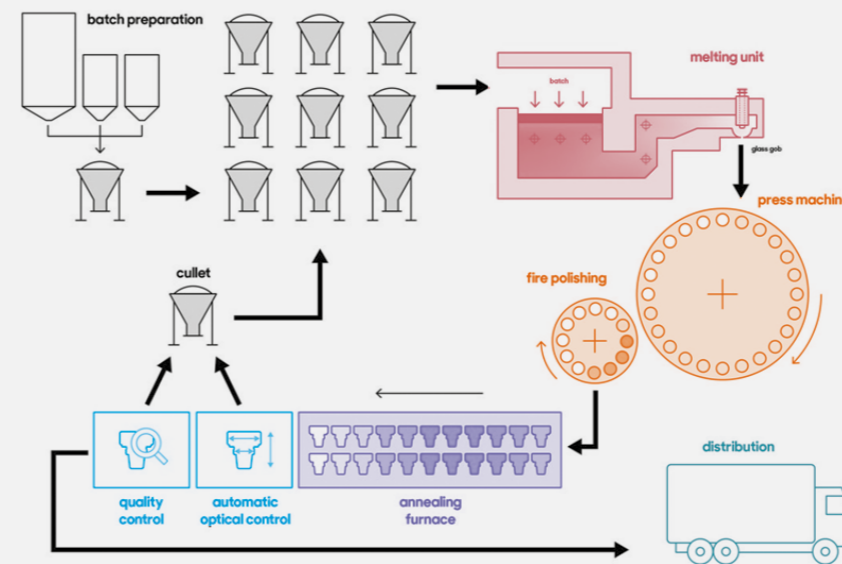
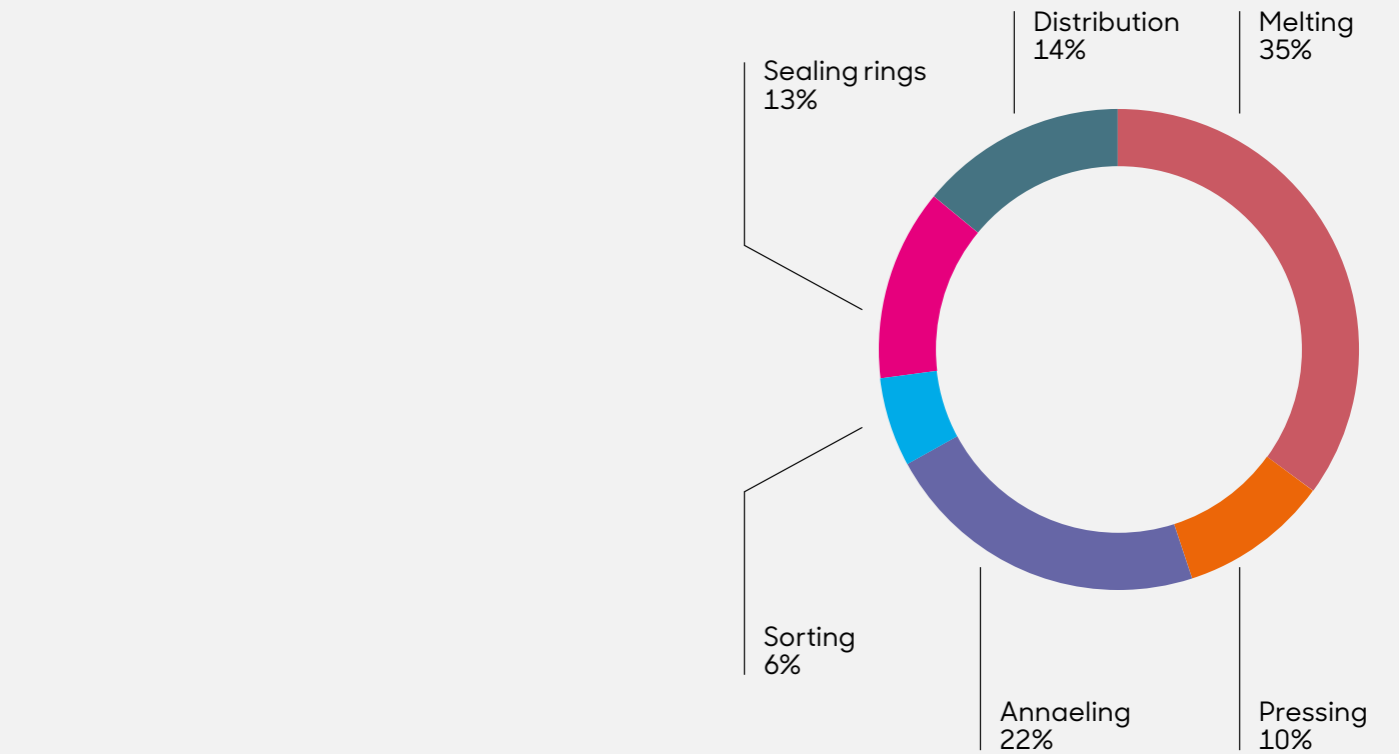
Vinolok:
Emissions associated
to raw materials
purchased, raw materials
transportation, waste
transportation and waste
generated in operations.

GHG emissions by scope



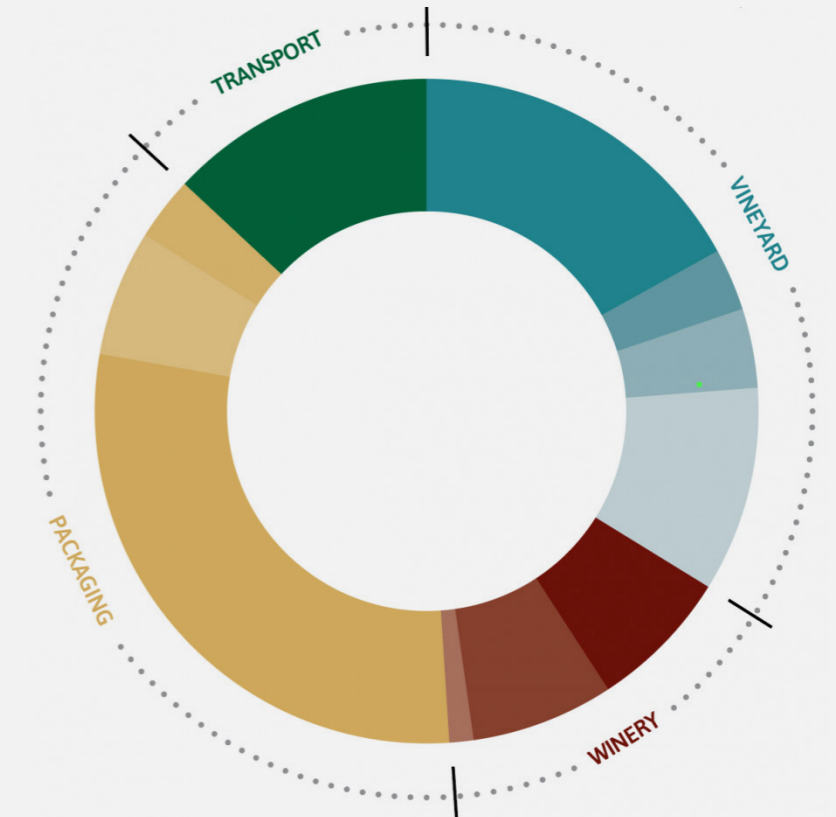
50% of GHG emissions are associated to scope 2 (Indirect emissions), from electricity acquired and consumed, followed by scope 3 (Other Indirect GHG emissions) and scope 1 (Direct GHG emissions). Melting process has the most significant impact in glass closure carbon footprint.

GHG emissions by glass closure





Greenhouse gas (GHG) emissions are defined as the increase in concentration of certain gases in the atmosphere, through the activities of human beings. Commonly referred to as the “Greenhouse Effect”, greenhouse gases trap heat reflected off the Earth’s surface, causing the planet to increase in temperature. Our carbon footprint is the measure of greenhouse gas emissions we are producing; this can be used to compare emissions ranging from a national level all the way down to an individual vineyard.



Vineyard

- Biogeochemical field emissions: 29%
- Fuel production and combustion: 3%
- Electricity consumption: 4%
- Raw materials production: 10%

Winery

- Fuel production and combustion: 7%
- Electricity consumption: 7%
- Other winery: 1%

Packaging

- Glass bottle: 29%
- Corrugated case box: 6%
- Other packaging: 3%

Transport

- Transport of bottled wine: 13%

Source: <https://www.decanter.com/magazine/climate-change-rethinking-your-drinking-467605/>



Celebrating

International year of glass 2022



The International Commission on Glass (ICG), the Community of Glass Associations (CGA) and ICOM-Glass are promoting 2022 as a United Nations International Year of Glass to **underline its scientific, economic, and cultural roles** and celebrate several anniversaries.

Talking about glass means talking about **recycling, tradition, and sustainability**. Glass is a substance made from natural materials and is one of the few materials that is fully recyclable without loss of quality. Glass is the best example of a circular economy, as it is entirely recyclable and with recycling it is possible to produce new products with identical characteristics to the original one an infinite number of times. It can be melted repeatedly and transformed into new Vinolok closures or other glass products. Glass is an archetype of sustainable packaging and as such is usually the first choice for consumers who are environmentally conscious. IYOG2022 is a dream come true, we hereby invite all friends of glass to celebrate this special year with us.

Our commitment to sustainability
is to reduce our carbon footprint
by 50% by the end of



2030



Improvement
areas of the future

Glass recycling



99.9%

Glass recycling has a direct impact on climate change and the use of recycled glass reduces carbon emissions and saves energy. **Internal process:** 99% of glass cullet from the Vinolok production is used again in the production of the closures.

Recycled glass melts at a lower temperature than virgin materials, so the use of recycled glass instead of raw materials helps to conserve natural resources. **Future improvement is 99,9%.**

water pollution

↓50%

air pollution

↓20%



Improvement
areas of the future

Circular Economy

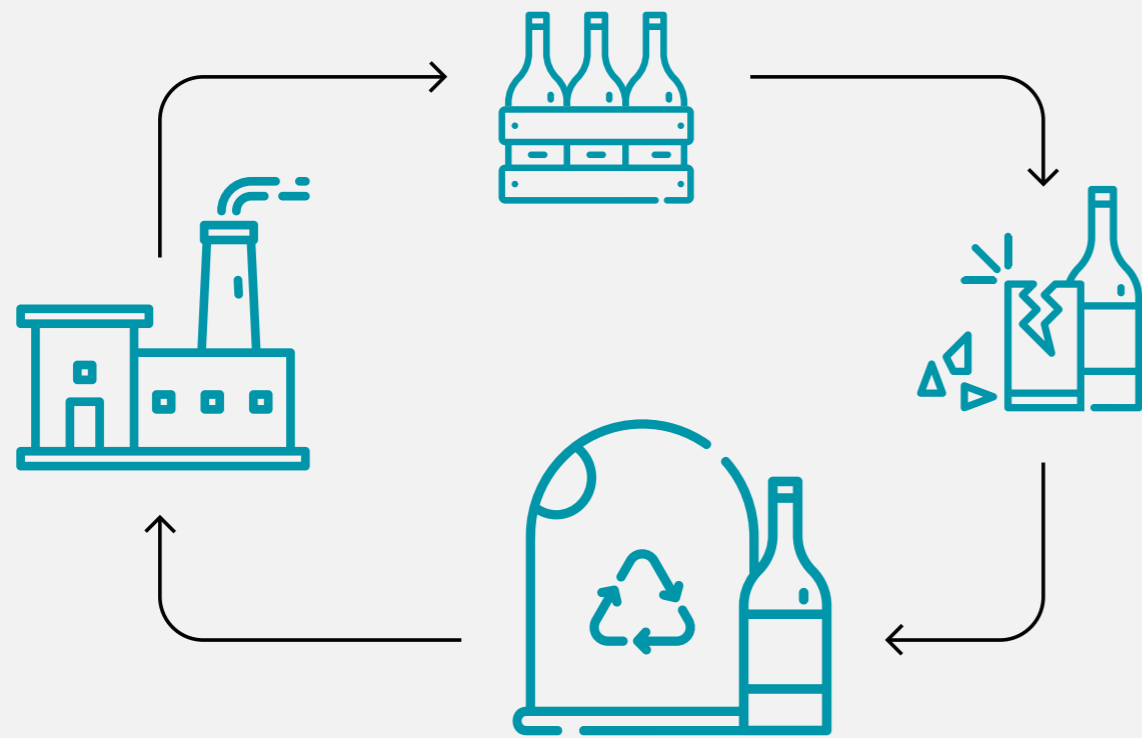


Support the worldwide ecological process to recycle more glass than now - recycling glass closure means giving **new life** to another product.

- Reducing the use of **resources and energy**.
- Glass produced from recycled glass lowers related **air pollution** by 20% and related **water pollution** by 50%.
- Diminish the space in **landfills**.

Circular economy practices offer the potential to capture the lost value from recycling of glass, **creating opportunities for the reuse of materials** and saving of raw materials, energy and carbon emissions.

Glass recycling



Internal process
of the glass
composition/
production
technology

By 2030

As part of our long-term planning, we will prepare a major study on innovations in the production of glass closures, especially in the proportion of higher recycled glass content (external).



Improvement
areas of the future

Energy consumption

2019–2022
Reduction in gas
consumption

After decentralizing the heating system in our HQ and production plant, we reduced the incoming energy consumption (kW/h) by 70% during the first heating season compared to the same period of the previous year.

2023–2030
Acquire green electricity. Up to 53% renewable with a zero CO² emission factor and the rest of electricity is from clean sources.

Improvement
areas of the future

The construction of new plant and production capacities.

This means an effective investment
in the adaptation of technology so
that the heat generated by glass
melting is used in other parts of the
production and administration area.



2026



Improvement
areas of the future

Technologies

2021 Recyclable box and trays

The cardboard box in which closures are delivered is made from recycled material (68%) and is suitable for further recycling after use. The trays are made of PET three-layer foil. The inner layer represents 80% of the total tray thickness and is made of already recycled PET material. Both outer layers are made of virgin PET material and thus meet the specifications for food contact material. The entire tray is completely recyclable.

2022–2030 Collaboration with suppliers. Identifying and implementing new opportunities for energy efficiency and decarbonisation.

vinelok.com/sustainability

