the PORTO PROTOCOL

Climate IN A BOTTLE

INTRODUCTION

It is the bottle, the very first layer in direct contact with the product and the one consumers interact with, that gets all the attention. But as we look at wine (packaging) from an environmental standpoint, and in the amidst of a climate crisis, a more holistic approach is needed, one that rethinks and questions choices from containers to closures, from cartons to pallets.

In the sections below, we'll take a look at the components from primary to tertiary packaging, as well as a few of the choices, solutions, issues and thresholds for each of them.

PRIMARY PACKAGING (AKA, THE BOTTLE AND BEYOND)

If you are an ordinary consumer in Shanghai enjoying a glass of a Premier Cru wine from Pommard or a New Yorker appreciating a glass of a Barossa Shiraz, chances are you are unaware of the fact that the beautiful, heavy bottle in front of you is by far the element that contributes the most to wine's **carbon footprint** or its **travel miles** before getting to your table.

- The container of choice by the industry, the **glass bottle,** is inert and safe in terms of food (and wine) security and keeps oxygen away[1]. It is 100% and infinitely recyclable, saving 20 to 40% energy on average. It can also be upcycled, without compromising quality or purity[2]. But its manufacturing process though, that uses mostly natural gas, is extremely carbon-intensive. Along with transportation, it accounts for approximately 40% to 50% of its whole carbon accounting. And it is the packaging that weighs the most[3].

A few of the solutions readily accessible to producers are:

1 https://parkcam.com.tr/en/new-research-says-glass-safest-packaging-for-food/
2 https://calrecycle.ca.gov/Glass/; https://www.gpi.org/glass-recycling-facts
3 https://www.sustainablewinegrowing.org/docs/California_Wine_Executive_Summary.pdf

- To reduce the weight of the bottle, as a 420g model will safeguard wine just as well as a 900g. A creative approach will make it look just as great[4] and sound communications will easily demystify the preconception that good wine requires a heavy bottle. The difference is that its carbon footprint will be significantly lower (take a look at Graphic 1).
- Understand how much recycled content goes into the bottle of choice and to what extent it can be increased (100%?)
- Standardize bottles and play with labels for differentiation, thus adding simplicity to logistics.

Continuing with wine containers, there are a variety of lighter and with significantly lower emissions options (Graphic 1)[5]:

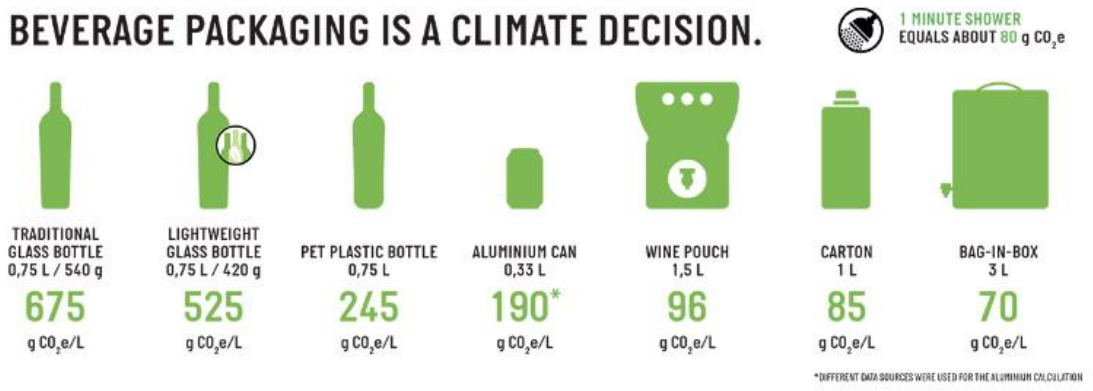

Figure 1 – Kindly shared by the ALKO monopoly

- PET recycled flat bottles challenge traditional shaped glass bottles both in carbon track and shape, showcasing the inefficiency of the century-old format. Though a fossil fuel based material, they're circular in nature as they're made of **recycled** PET

- Paper bottles have a lower water-production footprint (than a normal glass bottle), are made from 94% recycled cardboard and a food grade pouch, 80% recyclable and 77% lower plastic content than a standard plastic bottle

4 https://www.portoprotocol.com/case-studies/reduction-in-glass-weight/
5 Study on the environmental impacts and carbon footprint of different wine packaging types by Gaia Consulting Oy, commissioned by Alko https://www.alko.fi/en/responsibly/sustainability-of-products/beverage-packing-material-has-a-significant-climate-impact

- Aluminium cans, fully recyclable and able to come back to "life" without any loss of quality in a couple of months. They have to be melted in advance, with high energy consumption in the process (though less than primary aluminium production)
- Bag-in-Box combines cardboard, a plastic liner and a hard plastic tap and allow larger volumes per unit. Generally cheaper than wine in glass, producers such as Tablas Creek are contributing to change BiB's market perception
- Box tetra Pak, PET bottles, Ecotoles, Wine Pouch, Kegs, bio-sourced bottles are other available choices.

Just like the glass bottle, all these alternatives come with a "but", from non-recyclable components, food safety issues, wine's life span, to fossil fuels material origin.

They all have different recyclability credentials and levels of energy consumption in this process, but are they being recycled? Glass recycling rates vary tremendously depending on color, country, region. From 95% in Sweden, around 45% in Australia, 30% average in the US, to less than 20% in China (Nº7[6] in the total world wine consumption in mhl[7]). The same goes for other materials, from plastic to aluminium. And so recycling rates should be taken into consideration when looking at containers' choices.

- ➔ Container deposit schemes are key to increasing current rates. For example, in Maine (California, US), the beverage container redemption program includes a 15¢ refundable deposit on spirits and wine containers per bottle returned, registering a 90% success rate[8].
- ➔ It is also important to replace problematic combinations (e.g. PET bottles with metal closure) with better solutions (e.g. PET bottles with PET closure)

Other factors come into play. In many cases, packaging is sourced in one country, travels halfway around the world to be bottled/assembled, to then be shipped to an importer in another continent and, from there, be dispatched to the countries/markets of sale. In this equation, the **means of transport** counts significantly as slower forms of international shipping tend to be less impactful[9].

6 https://www.therealreview.com/2022/08/04/top-ten-wine-consumers/
7 Mhl - million hectolitres
8 https://anchor.fm/porto-protocol/episodes/Climate-in-a-Bottle-ev18cl;
https://www.maine.gov/dep/sustainability/bottlebill/index.html
9 https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions

- ➔ Shipping in bulk and bottling at the destination market (which happens with more than 50% of wine arriving in the UK) overcomes (part of) this issue and saves up to 40% of the carbon footprint. This is not a choice, though, with some of the existing appellation systems and some producers still fear potential quality loss, traceability risks and prospective unemployment that may result from this shift (though bottling is an extremely automated process).
- ➔ A great solution would be for wineries to reach mutual agreements to bottle at each other's facilities in different markets.

One choice that truly closes the loop is reusable bottles. Styria Bottle, Sustainable Wine Solutions, Oe for Good, Boutèy, Gotham Project, are among the several companies, of different nature, countries and at different stages of their endeavors, overcoming the various thresholds of these schemes, namely reverse logistics, local washing facilities, availability of wash-off labels, etc...

On this note, 3 members of the Porto Protocol will soon launch a new brand, Snowden Cousins, in a refillable bottle: Diana Seysses (Snowden Vineyards, Domaine Dujac and Porto Protocol's Global Steering Committee) and Melissa Saunders (Communal Brands), relying on Caren McNamara's (Conscious Container) expertise to wash the containers.

A universal bottle would certainly allow this circular solution to be scaled worldwide, as presently it is only viable within a certain perimeter.

But it doesn't take a whole scheme to create a reusable bottle or, more accurately, to envision a second life for it, as demonstrated by Denomination Drinks Design creation for Cowpunk, showcasing the role a design agency can have in designing a product with its whole lifecycle into consideration.

There are other components in wine's primary packaging:

- Labels, with glues, inks and plastic coatings, ruin chances of recyclability. Travel miles of the paper and whether it's coming from FSC run forests[10] are also important factors. Choosing wash-off, recycled paper and/or alternative fiber labels such as grass paper and grape residue, vegetable inks (soy or water based) are among the various lower impact substitutes available.

10 https://fsc.org/en/fsc-labels

Bold examples of upcycling label backings, that generally go to landfill, come from partnerships among different industries: The Park (Accolade Wines) 3D prints spare parts them and Concha y Toro (Chile) has them transformed into detergent packaging labels.

- Capsules, being the ultimate environmental choice to go capsule-free or at least to reduce their size.
- Closures, from aluminium screwcaps to plastic or natural cork, vary in environmental footprint, the latter to have an overall lowest impact[11], even claiming to be carbon positive. One can say they rank similarly on recyclability though dependent on local requirements, but are they being recycled? are consumers aware of how to discard each appropriately?

SECONDARY, TERTIARY PACKAGING AND BEYOND

Secondary packaging makes quite a first impression on consumers, but it also means an extra layer, energy and water usage and additional weight and size, may it be cardboard, foam, plastic, varnishes. Furthermore, mixed materials add premiumization but compromise recyclability. All of the replacements to labels may be suitable for secondary packaging with creativity playing a key role.

There are already replacements for traditional wood boxes, a common choice in the wine world, made out of wood scraps or with a second life as a birds nest.

But packaging goes beyond what you see in the supermarket shelf. As one looks behind the scenes, tertiary packaging and a few of its complicated materials deserve proper attention and revaluation.

- Outer cases: closure type, carton's origin (FSC certified? recycled?), cut and waste from production can all be taken into account.
- Inks and glues, and its respective origin. Substitutes are, for example, algae ink and digital printing.
- Tapes, whose recyclability depends on the type and local recycling center's requirements. Less impactful options are paper based, ones with recycled content, plant-based or simply using less amount (possible depending on the outer case of choice).

[11] https://www.thedrinksbusiness.com/2017/02/wine-closures-the-facts/

- Styrofoam, quite common in Direct to Consumer sales, is an environmental issue, and some countries don't even recycle it (e.g. USA). A few alternatives are compostable pulp separators (winter only), molded fiber shippers (made with waste paper and molded fiber materials that can be molded to various shapes or sizes) and a level 1 insert liner able to support a no-sweat ice pack, made out of recycled water bottles.
- Stretch Wrap isn't reusable and difficult to recycle. Though not an easy fix, reducing the number of wraps, process automation, reusable pallet straps, biodegradable wrap (Bruce Jack, South Africa), recycling it into a new one, or none at all (The Park, UK/Australia, has achieved this in their canned products through the use of interlocking layer pads), there are daring solutions coming to life.

- As for Pallets, from a cradle-to-grave perspective, wood ones have a lower carbon footprint than their plastic competitors[12] (though several contradicting sources say otherwise). Options are reusable, FSC certified, 100% recycled, 100% recyclable and lighter weight.

Wine producers are specialists in wine, not packaging, but they certainly lease with those who are:

- ➔ Visit suppliers and work in partnership to find solutions, efficiencies and savings, from the printer to the glass plant
- ➔ Ask questions: what is each packaging made of, from bottle to capsule? its afterlife? Can it be reused or recycled? If recyclable, how long does it take for it to come back to life? what goes into landfill? how long does it last until it breaks down, 1000 years or 6 months? is it harmful to wildlife? where is the silica in the bottle, the paper in the label, the cork coming from? Are there alternatives to the PET or paper? how are suppliers getting their own supplies? the entire supply chain is important.

Embrace technology, explore new materials, learn from other industries, producers, purposefully rethink design, every component, why, their provenance, sourcing as close as possible to bottling facilities. This will reduce impact, production costs and increase efficiency.

[12] https://www.sciencedirect.com/science/article/abs/pii/S0959652622020479

The lighter and more recyclable the packaging, the smaller its climate impact. But we are not going to recycle our way out of this climate crisis. We must move away from single use and towards materials and solutions that close the loop, contribute to a circular model and savings in natural resources.

One size doesn't fit all. So the question is not what packaging is green (if any) but what packaging is greener for what wine, during how long, in what market? Does it need aging (most wine really doesn't), will it be drunk shortly after bottling and purchased? Is it being sold locally? These are just a few of the questions that can generate change.

CONCLUSION

At the Porto Protocol, we trigger, promote, share, see change every day. In fact, the packaging "cluster" is one of the most dynamic ones in our community.

But it is not happening at the scale and speed we need. Climate change still occurs at a significantly faster pace than the shifts in the choices of producers, consumers, retailers and stakeholders alike.

As farmers, we are by nature safe guardians of the land and the only agricultural product to speak directly to the consumer. And though one industry alone cannot change the world, but it can certainly lead the way. Shall we?