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Title: **Nomacorc Plantcorc™ wine closures: better biobased performance than cork?**

Author: **Olav Aagaard**

Contact details:

Dr.ir. Olav Aagaard  
Vice President Exploratory R&D  
Nomacorc Sprl / Vinventions LLC  
Chemin de Xhénorie 7  
B-4890 Thimister-Clermont  
Belgium  
T +31 6 34687360  
E olav.aagaard@vinventions.com



Curriculum:

Olav Aagaard has been working for over 25 years in the field of polymers in R&D and business development functions. He has a MSc degree in chemical engineering and a PhD in organic chemistry from the Technical University of Eindhoven in the Netherlands. Olav joined Nomacorc (the leader in alternative wine closures) in 2005. He has been instrumental and responsible for several process and product innovations, which includes the transition to a biobased raw materials feedstock leading to the Nomacorc Plantcorc™ closure portfolio. Prior to joining Nomacorc, his career included a 12-year period with DSM. After leaving DSM in 2003 and before joining Nomacorc, Olav spent two years at a financial start-up company, Cardano Risk Management, with responsibilities for marketing and sales. Nowadays, with the acquisition of Nomacorc by the Vinventions group in 2015, he is now responsible for all of Vinvention's Exploratory R&D.

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Abstract:

The wine closure business has been dominated for decades by cork. However, due to quality problems like cork taint, alternative wine closures have rapidly taken market share since the beginning of this century. One of these alternatives is a specialty polymer foam product which is sold under the Nomacorc brand name and sells worldwide over 2 billion units per year. Quality, tunable barrier properties and consistency were the main drivers for growth of this coextruded, polyethylene-based product. These technical performance characteristics were clearly differentiating from cork, and are highly appreciated by enologists and winery production managers. However, in order to sustain growth, Nomacorc had to also improve perception and sustainability characteristics of the closure. A major stride was made in 2013, by the introduction of biobased raw materials in our product which led to the creation of the Nomacorc Plantcorc™ closure portfolio in 2016. This paper will discuss the results and learning points of transitioning towards such a biobased raw material and will provide an insight in how we can make wine closures with better biobased performance than cork.

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## Nomacorc Plantcorc<sup>TM</sup> wine closures: better biobased performance than cork?

**Olav Aagaard, June 15, 2017**



Wine Quality Solutions



Wine Marketing Solutions



## Let's talk Vinventions & wine closures.....



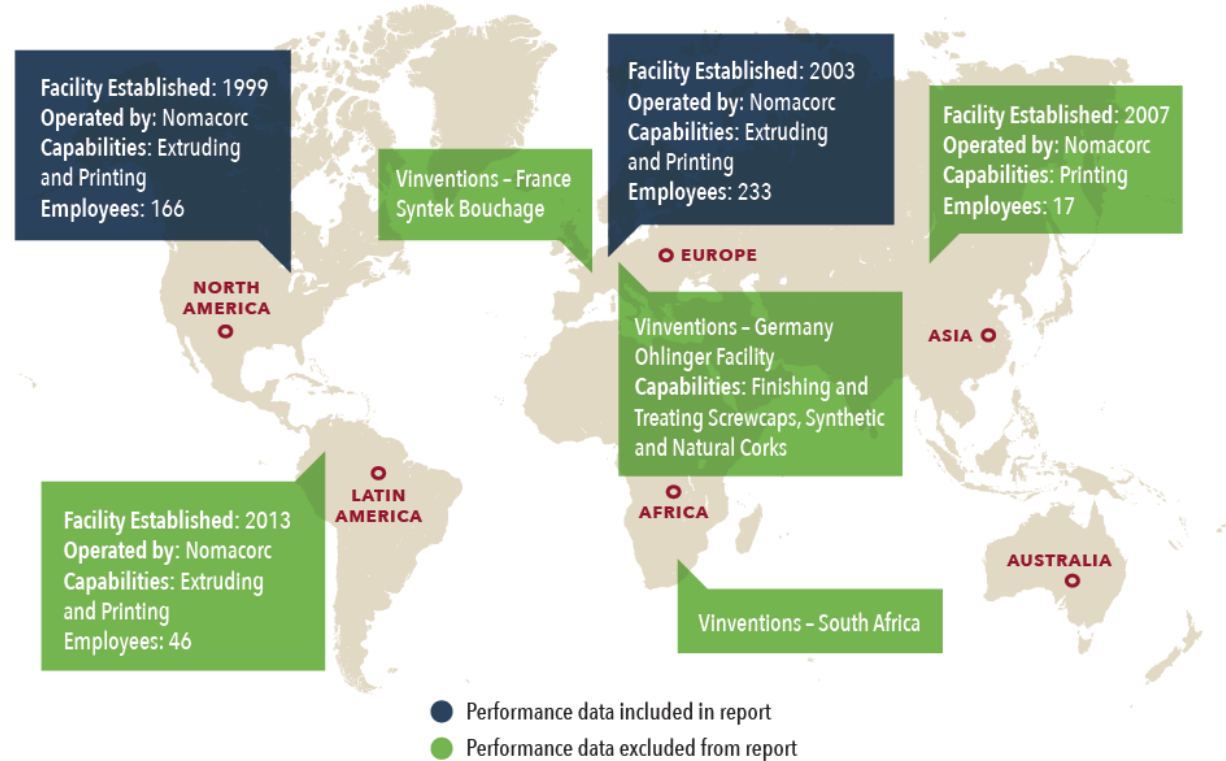
So what does this has to do with biobased performance materials?



# Vinventions: who are we?

## VINVENTIONS SNAPSHOT

- 7 global production facilities in the United States, Belgium, China, Argentina, Germany, France, and South Africa.
- Producing over 2.5 billion closures each year, closing every eighth bottle worldwide.
- Serving over 5,000 wineries in 40+ countries on 6 continents—North America, Europe, Latin America, Australia, Asia, and Africa.



We sell complete closure solutions for bottled still and sparkling wine

















# Vinventions = House of 7 Brands

V I N V E N T I O N S <sup>™</sup>

**Vision** Be the most **innovative** and most **trusted global** supplier of **complete wine closure solutions** to the still and sparkling **wine** industry

**Mission** We help **wineries and retailers** ensure their wines **present** as intended, **delight** the consumer and **succeed** in the marketplace.

**Solution categories**

	<b>PlantCorc</b> 	<b>Synthetics</b> 	<b>Natural Cork</b> 	<b>Screwcaps</b> 	<b>Glass Closures</b> 	<b>Oenological Services</b> 	<b>Marketing Services</b> 
<b>Brands</b>							

**Innovative Products and Services for All Our Customers Closure Needs**

We consume roughly 13 kton of polymers per year



## Wine = Luxury food



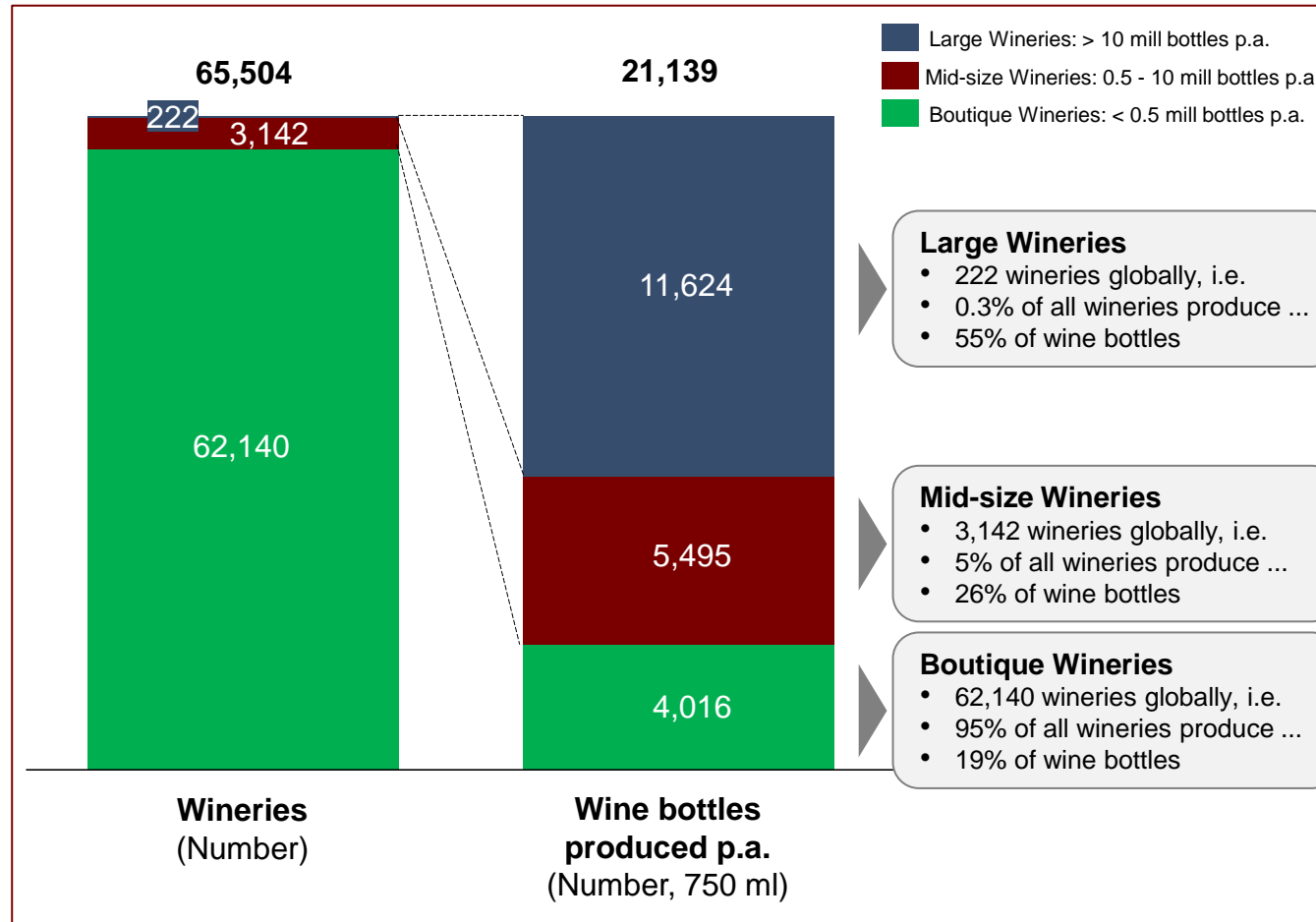
And what to drink? Too many choices



# Wine industry has a very fragmented supply side

Too many brands so how to differentiate?

ABC Analysis 2016 of the world's wineries

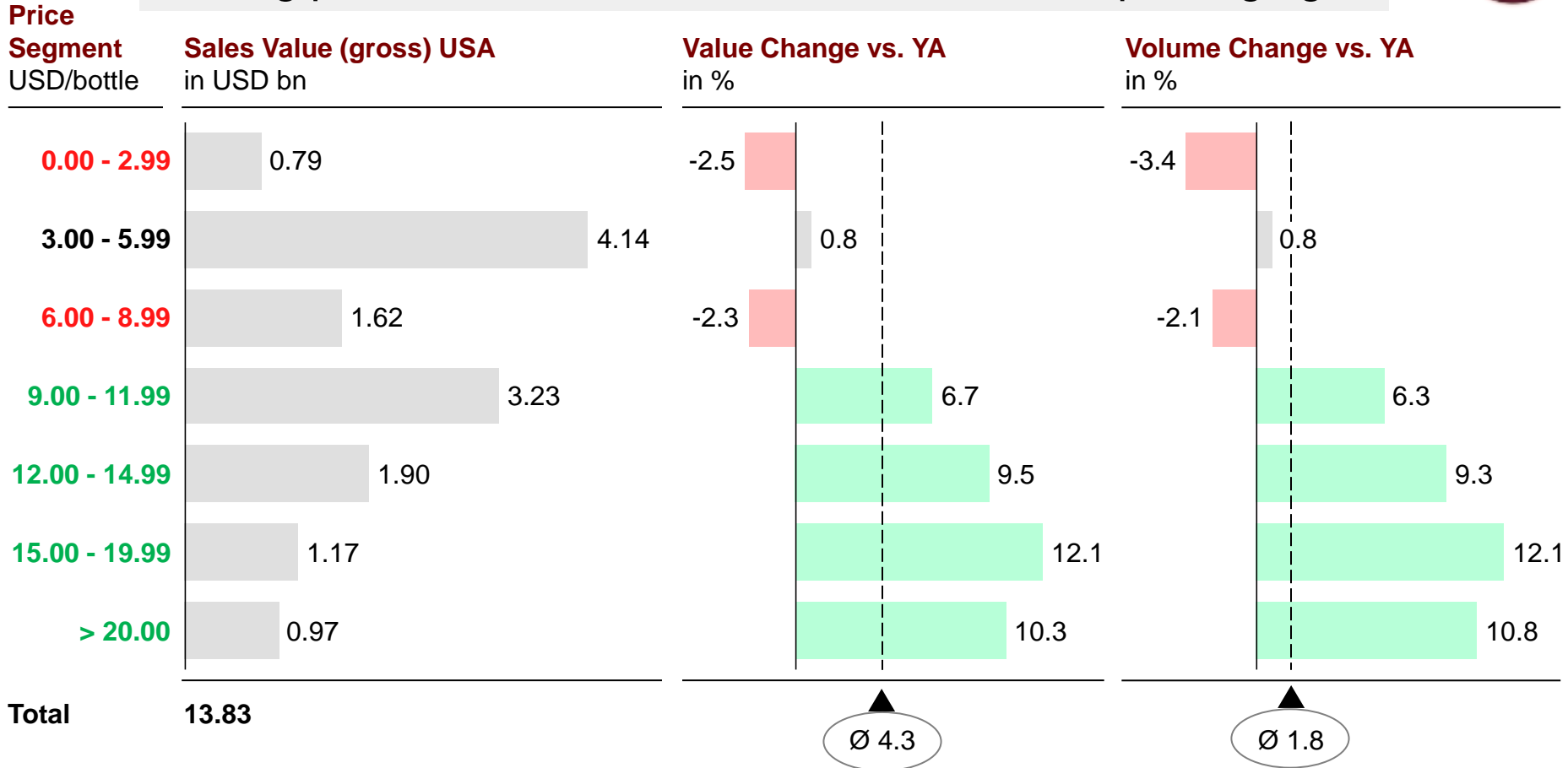


# Premiumization: Driven by high growth in high-value segments

USA Wine Sales, 52 weeks 2016



Going premium: what does this mean for wine packaging?



Source: Nielsen Total U.S. All Outlets (xAOC + Liquor Plus + Conv + Military); 52 w/e 1-2-2016

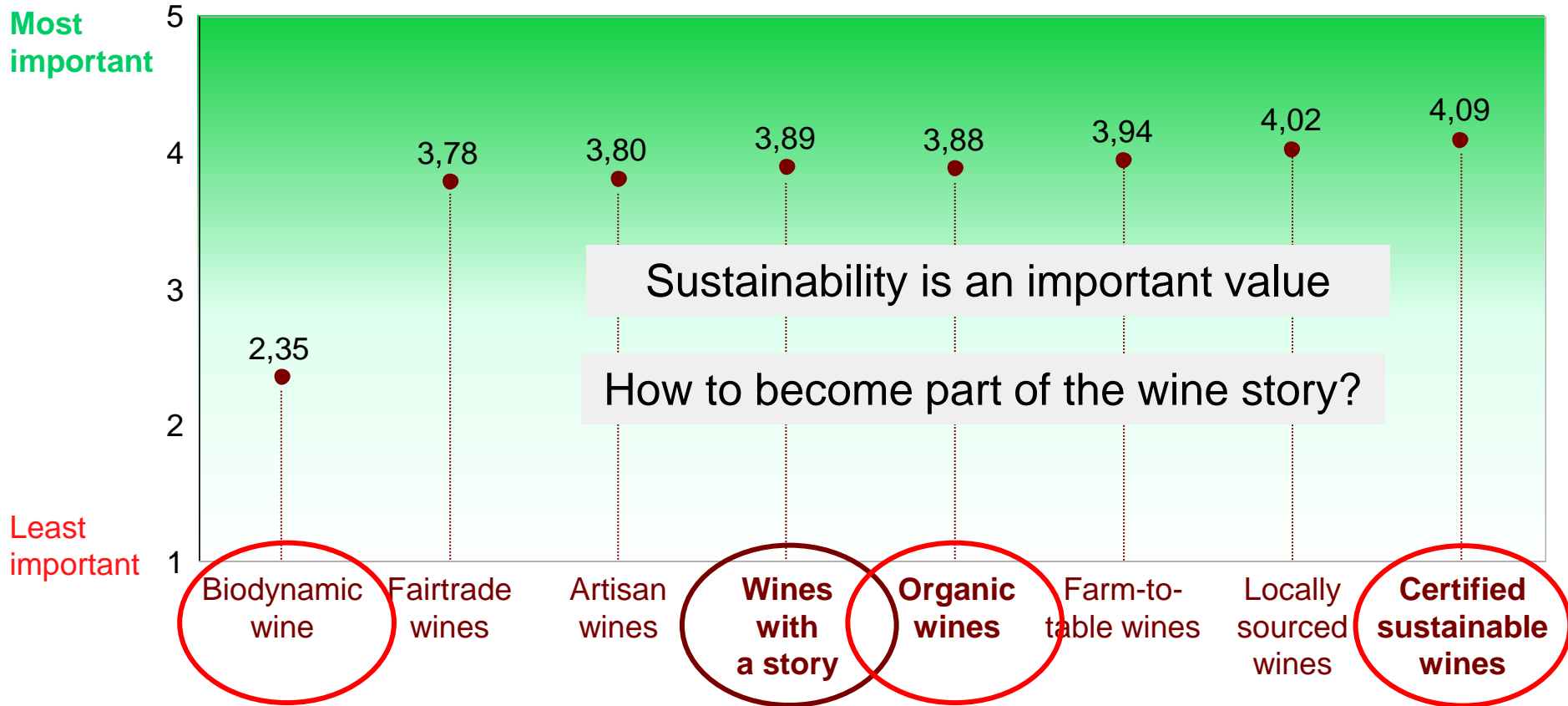


# What is important to the wine consumer?

Motivations for Wine Purchasing – Frequent premium drinkers (Total USA: 37 million)



How important for US wine drinkers are the following factors when purchasing wine?

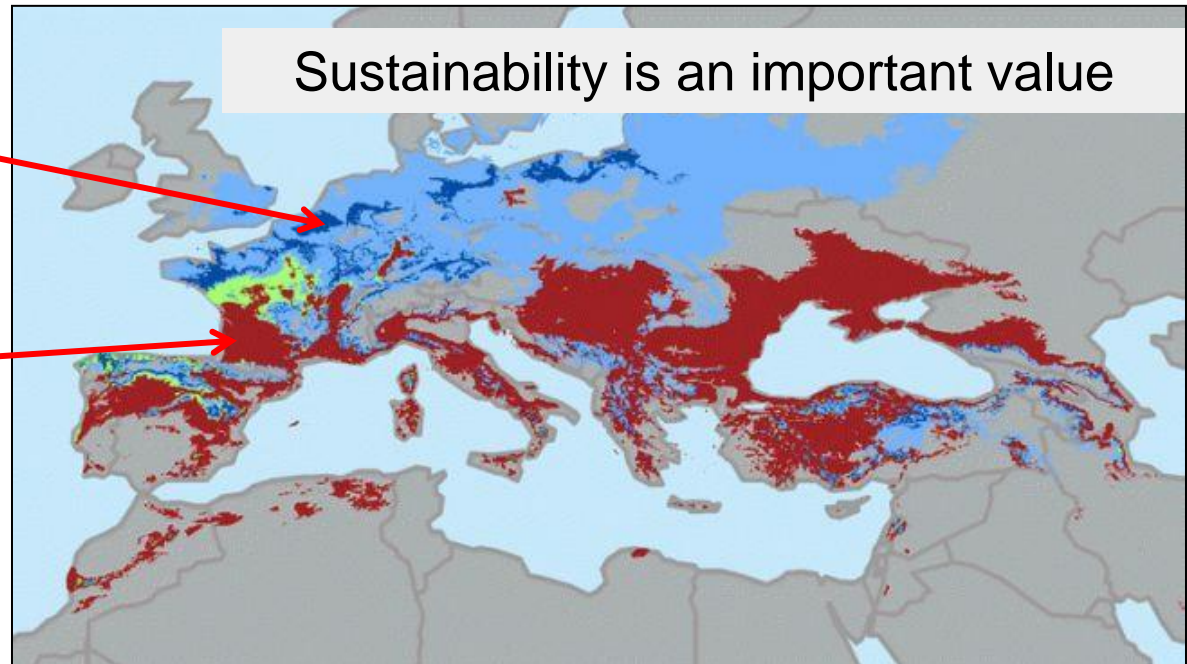


# What is important to the winery?

## Climate change, wine, and conservation

Lee Hannah<sup>a,b,1</sup>, Patrick R. Roehrdanz<sup>b</sup>, Makihiko Ikegami<sup>b</sup>, Anderson V. Shepard<sup>b,2</sup>, M. Rebecca Shaw<sup>c</sup>, Gary Tabor<sup>d</sup>, Lu Zhi<sup>e</sup>, Pablo A. Marquet<sup>f,g,h,i</sup>, and Robert J. Hijmans<sup>j</sup>

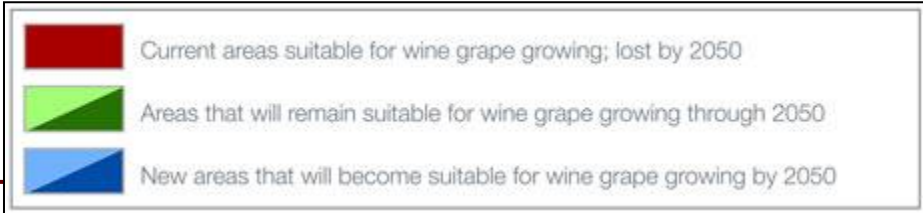
PNAS 2013, 110(17) 6907-6912



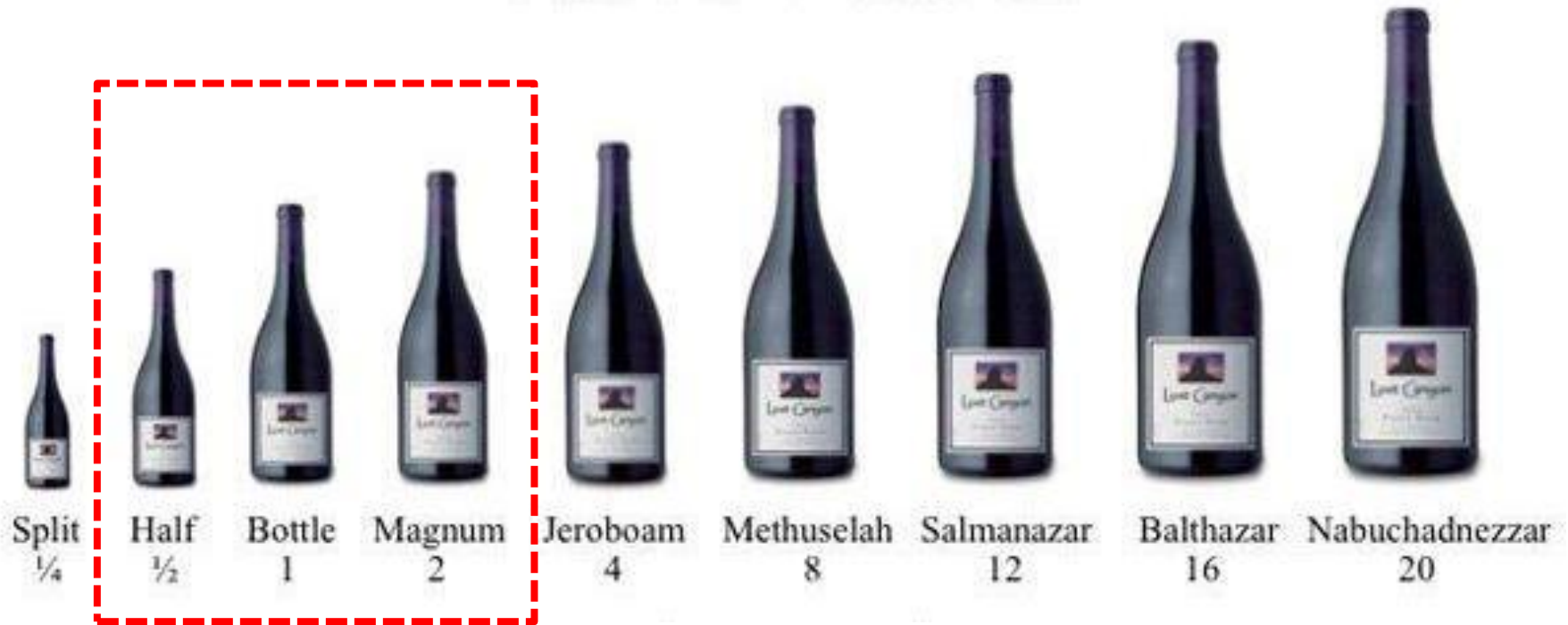
Solution:  
Wageningen

Challenge:  
Bordeaux

Global warming  
will influence wine  
production  
location



## Wine = luxury product so glass bottle is the preferred packaging



Majority of wine is packaged in half, normal & magnum bottles

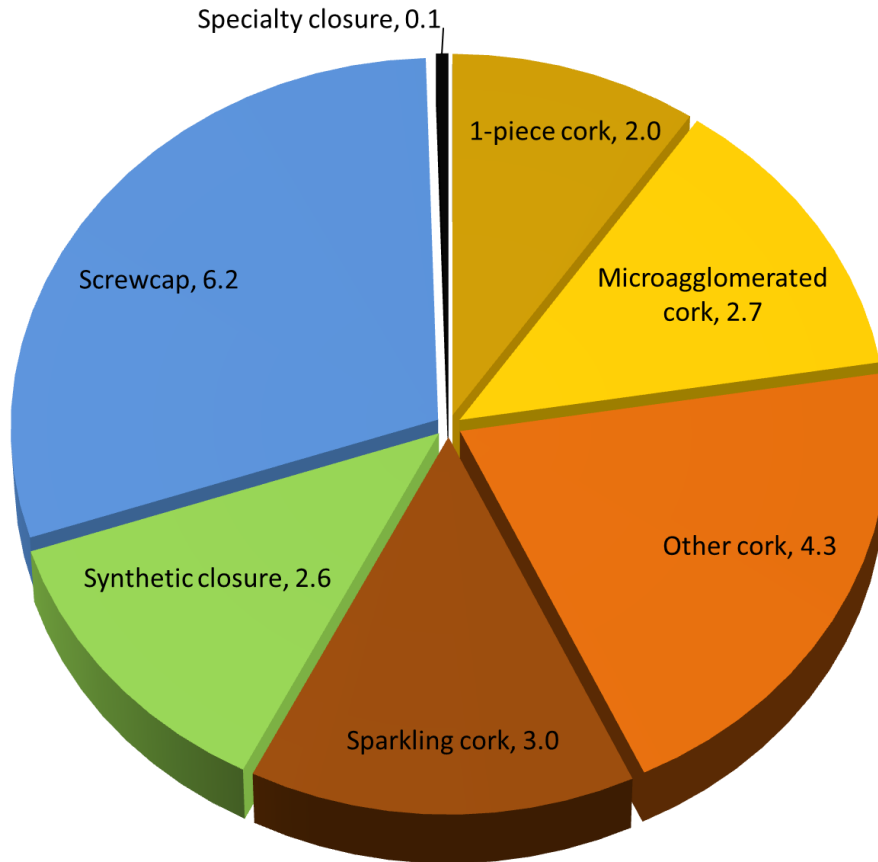
Roughly 21 bln bottles per year = 21 bln closures per year

Roughly 100 kton closures per year



# Closure market overview

21 billion wine closures sold per year



Overall bottled wine market grew modestly at 1-2%

1997: "Cork" 98% market share  
2017: "Cork" 57% market share

Closure costs 1% wine sales value

Replacement market so  
"Closure Wars"

Closure choice driven by:  
Wine Quality  
Ease of Opening  
Wine "Experience"  
Cost

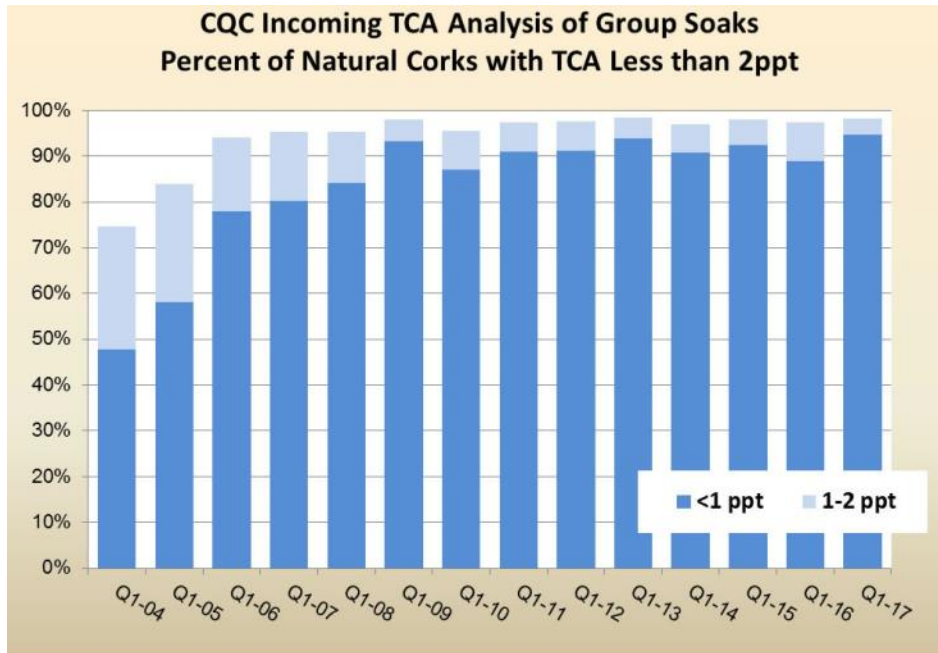
Growth alternative closures driven  
by Wine Quality and Ease of  
Opening

Cork market share driven  
by the Wine "Experience"



# Closure wars: cork taint opened the door for alternatives

## Cork Quality check USA



**Cork taint driver of alternative closure growth**

**Cork taint risk reduced but not eliminated**

**Current estimate 1-2% cork taint**

**But also other quality problems like inconsistency of wine aging**

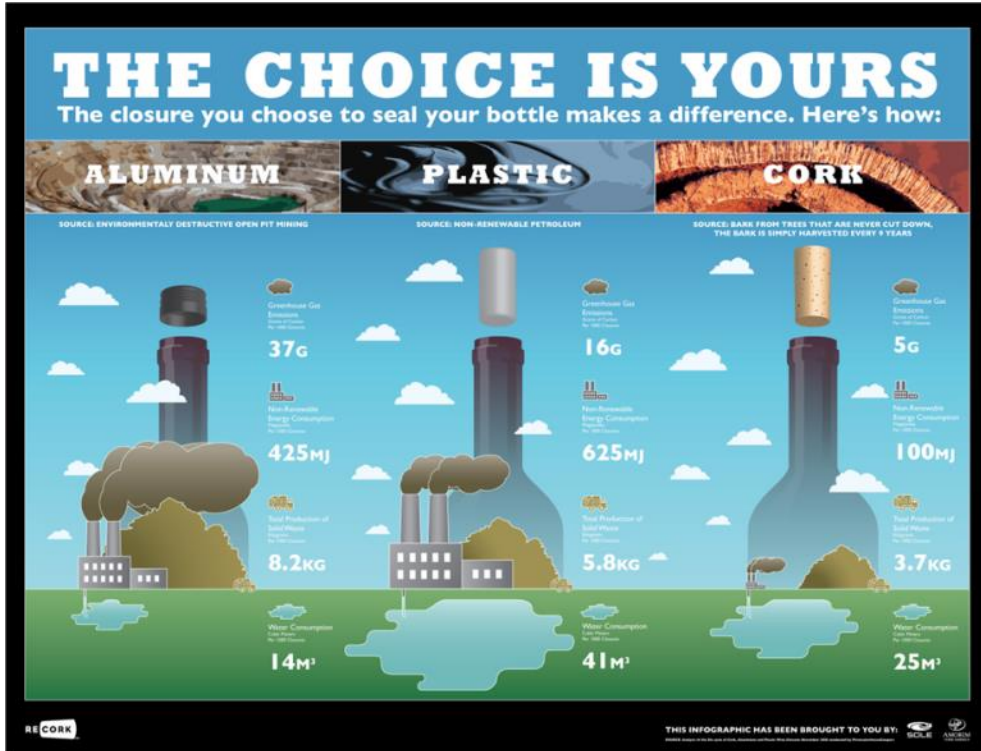
**Alternatives better, more consistent and cheaper**

**Took the cork industry 10 years to find “a solution”**



# Closure wars: environmental footprint

2008



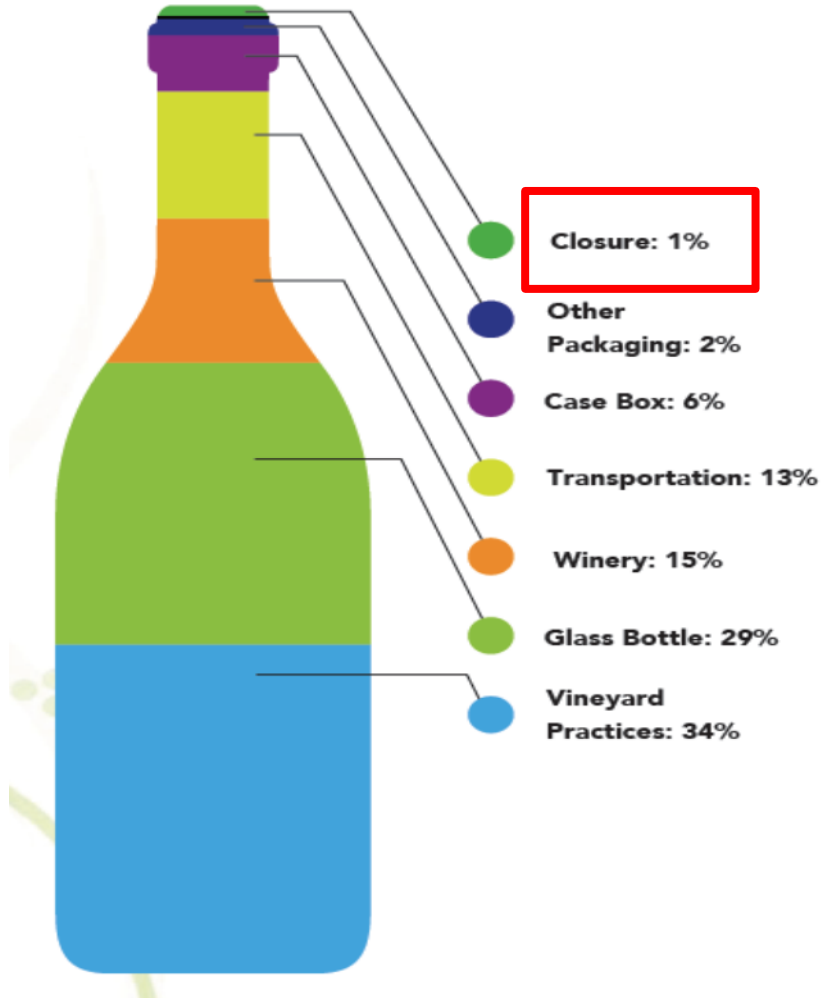
Sponsored 3<sup>rd</sup> party study

Framing the alternatives as polluting and non sustainable

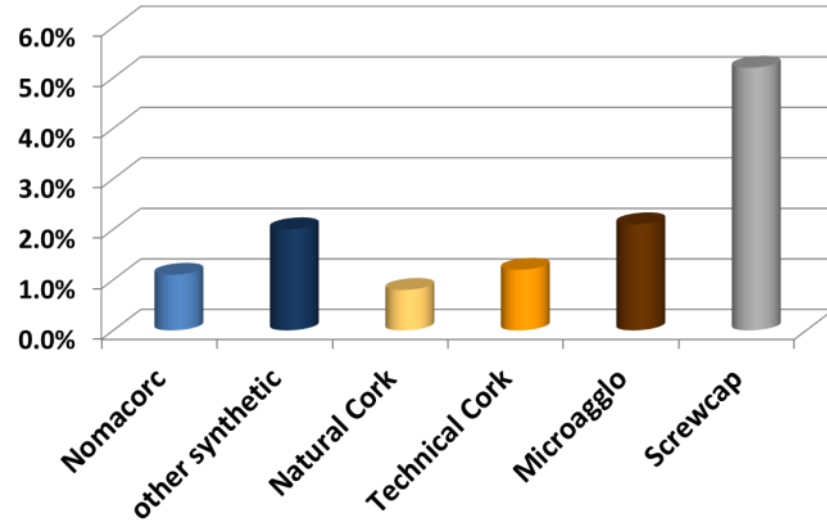
Spending 40 mln euro in marketing to promote the natural cork benefits



# Environmental message relevant?



Closure 1% of total carbon footprint



Nomacorc outperforming cork !  
But not in the perception  
of people's minds



## Plastic Fantastic?

How to deal with plastic perception?



It will take time, money and innovation





## Solution: Become the most sustainable closure



**Braskem bio-sourced polyethylene**

**Our research started in 2011**

**Commercially launched in 2013**

**Called Nomacorc Select Bio made with Plantcorc<sup>™</sup> technology**

**Zero-carbon footprint**

**Zero wine faults**

**100% recyclable = Zero waste**

**GO FOR  
ZERO!**



# Plantcorc™ Technology

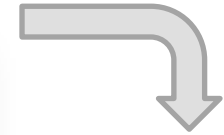
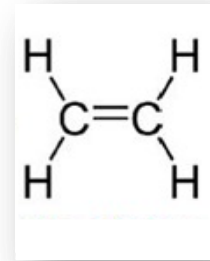
Sugarcane  
in Brazil



Sugar  
Fermentation



Bioethanol  
Dehydration



Polymerization



Carbon Capture  
-2 kg CO<sub>2</sub>/kg PE

Green Ethylene

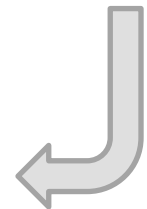
Plantcorc™ technology leads to a zero carbon footprint closure

Green Polyethylene

Coextrusion



Select Green

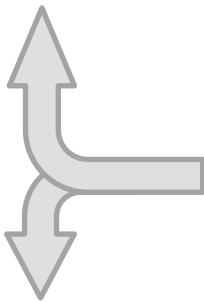


-4 gr CO<sub>2</sub>eq (EU)



-1 gr CO<sub>2</sub>eq (EU)

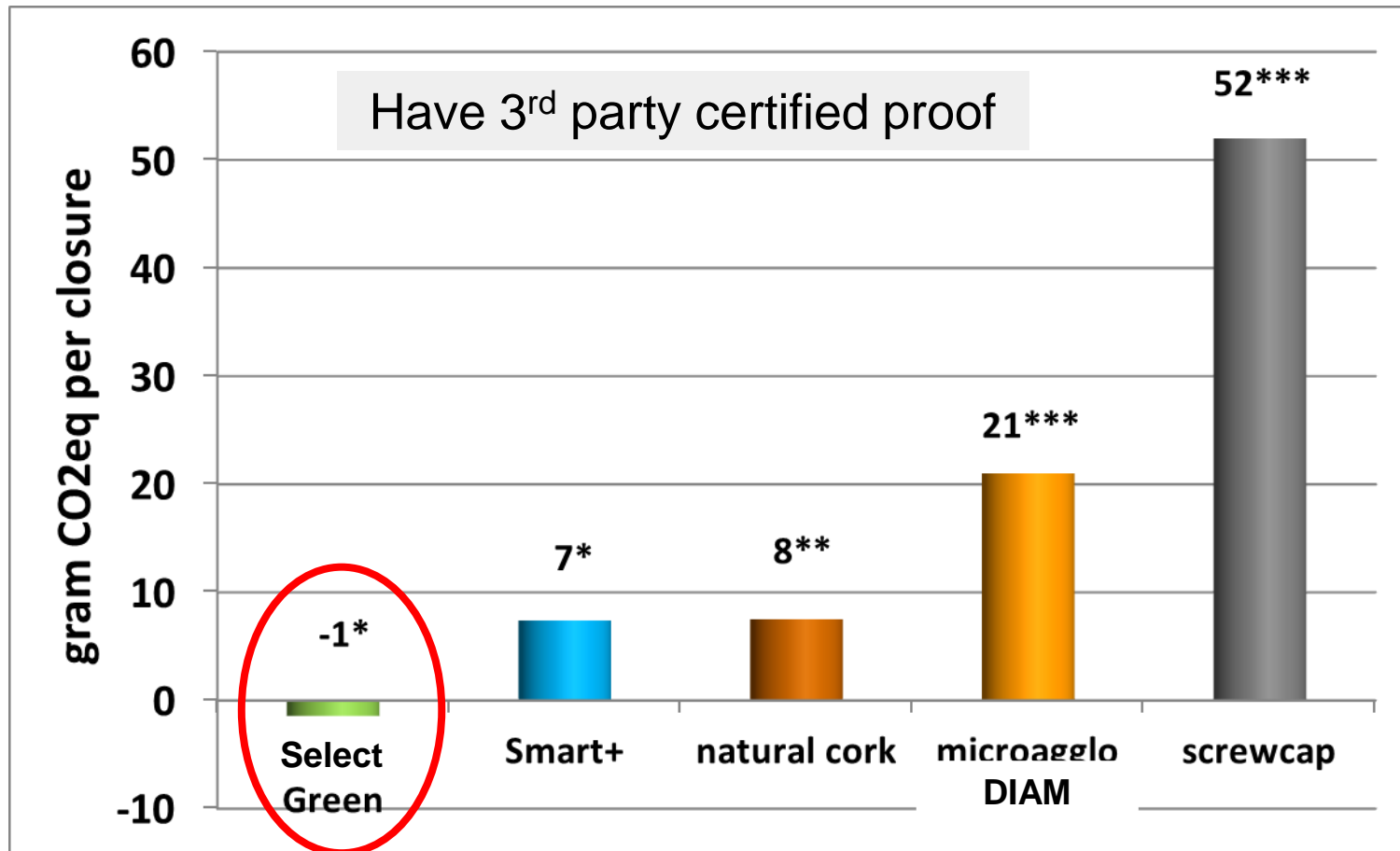
Release upon incineration



Landfill (Recycling)



## Become the most sustainable wine closure



\*Carbon footprint data Nomacorc, note Vinolok CF estimate 20-50 gr CO<sub>2</sub>eq

\*\*Demertzi et al. J. Cleaner Production 92, p. 206-215, 2015

\*\*\*<http://www.institutduliege.com/colloque2008/Caroline%20Forgues.pdf>



## Have 3<sup>rd</sup> party talk about your innovation



2013, Italy



2014, UK



**IPA AWARDS**  
INSPIRATIONAL PACKAGING

2014, Spain



2014, US



More than 350 press articles



## Upgrade to allow for premiumization

& be careful how you call yourself



**Changed the look & feel to resemble high-end natural cork**

**No more (perception) issue for premium wines**

**Changed the name from Bio to Green**

**Bio was confusing for (French) consumers which associate this with organically grown**

**2016: Extended the product line to Nomacorc Green Line**





# Offer sustainability at all price points: Nomacorc Green Line

## Superior Performance

- Wine preservation up to 25 years
- TCA and migration free
- Consistent & controlled O<sub>2</sub> ingress
- Reliable bottling performance
- Easy opening and reinsertion
- Optimum wine preservation



Reserva



Select Green



Classic Green



Smart Green

## Enhanced Design

- Natural woodgrain markings
- Soft-feel skin
- Premium end treatments

## Higher Sustainability

- Renewable plant-based materials
- Lowest carbon footprint
- 100 % Recyclable
- Using renewable energy

## Introducing Zest

### The World's First Zero Carbon Footprint Premium Sparkling Wine Closure

- Single piece construction
- Glue and TCA Free
- Consistent O<sub>2</sub> ingress
- High CO<sub>2</sub> retention
- Zero carbon footprint
- Fully recyclable



Zest



# Offer all closures with exciting innovation

## Superior Performance

- Long term wine preservation
- **Bottle-to-bottle consistency**
- **Guaranteed TCA taint free**
- **Clean & migration free**



SÜBR

"The World's Most Sustainable Micro-Agglomerated Natural Cork"

## Enhanced Design

- High performance microagglomerated closure look
- Printing optioning including fire-branding and offset printing
- Custom side & end printing

## Higher Sustainability

- **Glue free composition**
- **Long term biodegradable**
- **Fully recyclable**
- **Fully compliance of regulations governing direct wine contact**

## Ohlinger Selektion = The Pinnacle in Natural Cork Performance!

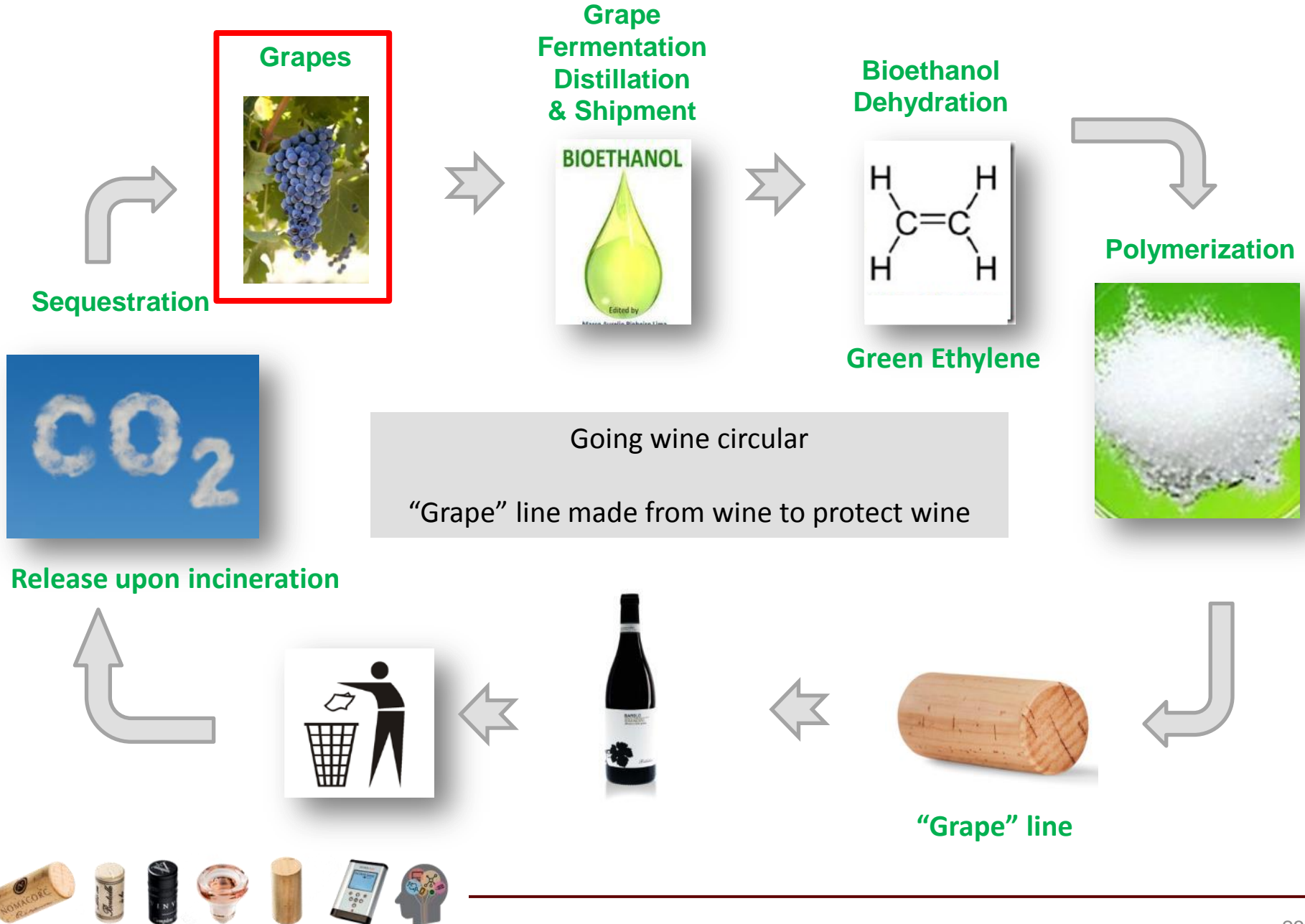
- Optimum top quality natural cork appearance
- Each cork individual tested by expert sensory professionals
- Guaranteed free from TCA taint and off aromas and flavors



**Ohlinger SELEKTION**



# Become part of their story

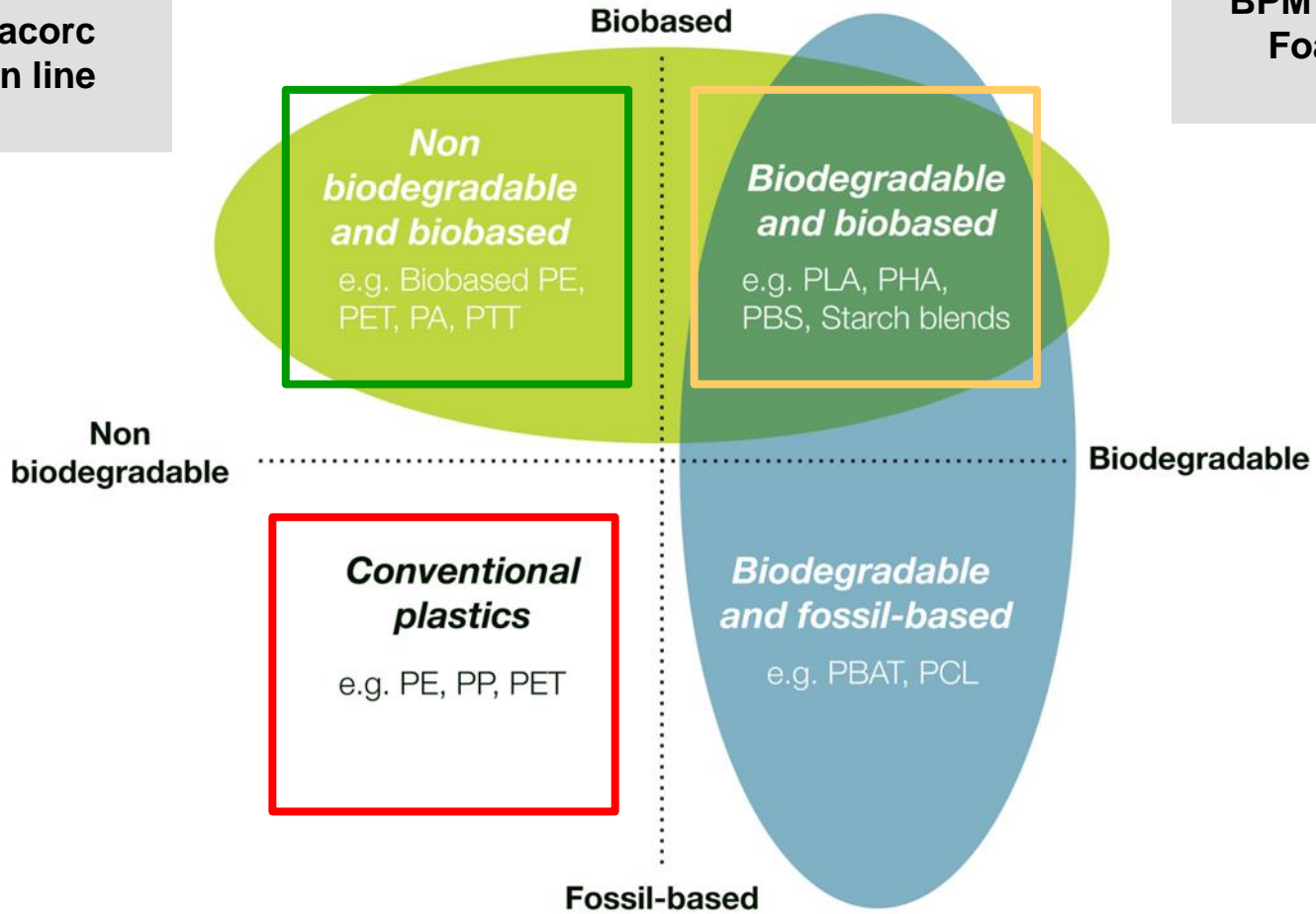




# Keep on innovating

Nomacorc  
Green line

BPM project  
Foamex



**Thank You !**

**and now time for a glass of wine**



Wine Quality Solutions



Wine Marketing Solutions

