



BIOSWITCH

ORGANIC ARTISAN COFFEE

THE GOOD PRACTICE CASE STUDY BICO BVBA

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Abstract

This case study describes the transition journey of Bioco, an organic, artisan coffee roasting company from Belgium. For Dieter and Jo, co-owners of Bioco, it goes without saying that the sustainability of their product – ensuing from its production and processing – must have a counterpart in its packaging. Initially incited by consumer push, Bioco made a radical shift towards bio-based packaging, packaging produced from biomass, to decrease dependence on finite fossil carbon resources. Moreover, their coffee capsules are not only bio-based but also industrially compostable. Indeed, throughout their transition journey, Bioco has always strongly considered actual or expected end-of-life management processes in Belgium. Hence its company slogan: “Bioco leaves nothing but a great taste”. In Belgium but also at European level, Bioco has been a true pioneer: only very recently bigger players such as Lavazza are going the same route. For Bioco to be a first mover its smaller scale has come as an advantage, especially in terms of strategic decision making, supplier collaboration and pricing strategy



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Company background

Bioco is a small Belgian coffee-burning company established in 2016 honouring the craft of roasting coffee. They refuse turning to industrial fast-roasting methods but swear by allowing the beans to roast slowly. This ensures for an optimal aroma, wherein the essential oils of the coffee bean are stored within the bean.

While Bioco distributes to a couple of bigger retail channels in Belgium, the company has only two employees – Dieter and Jo – on the payroll. However, it is precisely this smaller company scale, which has enabled them to set their rather idiosyncratic course in the global field of sustainability.



More precisely, Bioco has been a first mover in two areas. Firstly, Bioco is the sole 100% organic coffee-burning company in the Benelux. Secondly, they are a pioneer in Belgium when it comes to their packaging choices. Most notably, they currently use 100% bio-based and compostable coffee capsules with guaranteed functional performance.

Consumer concerns kick-started Bioco's transition journey to more sustainable packaging

Dieter and Jo are both intrinsically motivated to weave their company strategy around the more sustainable sourcing and cultivation of coffee beans, the craft roasting process, and fossil-free and more ecological packaging solutions. Yes indeed, they connect entrepreneurial mindset with aspirations to a fairer and better world.

Adopting bio-based packaging solutions, however, has been a true 'transition journey' initially incited by consumer push. Amid the chaos of starting a new company, Bioco initially opted for packaging that visually differentiated the company from their "168 potential competitors" on the supermarket shelves. Thus, they initially sold their coffees in paper tubes with aluminium coating and metal lids.

While certainly eye catching, the critical consumer base of the organic market did not fail to raise their concerns. These concerns have become the start of a thoroughly researched transition journey towards more sustainable packaging options.

Bioco's radical shift towards bio-based packaging

Jo Temmerman (Co-Owner Bioco): "Fossil-based plastic remains a huge problem if you know that globally around 350 million tonnes are produced annually. It is time to shift not only to more sustainable products but also to more sustainable packaging. For us it is critical that after drinking our coffee, it is only its taste that remains."¹

Bioco has evidently no R&D department, but Dieter and Jo plunged into extant research on sustainable packaging options and combined such with actual 'field work': they consulted suppliers, the Public Waste Agency of Flanders (OVAM) and different inter-municipal waste collection bodies (the so-called 'intercommunales') to understand actual end-of-life management processes.

This journey resulted in the uptake of a coffee pouch that for 89% consists of bio-based, renewable materials – mainly cellulose and sugarcane biomass residues – and coffee capsules that are 100% bio-based and compostable.²

For the coffee pouches trade-offs had to be made. Most notably, fully bio-based and compostable pouches would – at least at the time of decision taking – not guarantee airtightness, which would lead to shorter shelf life, and thus to an assumed bigger global ecological footprint, given the energy-intensity of coffee production.

For the coffee capsules, this problem did not pose, given the sturdy material required for coffee capsules provides sufficient thickness to guarantee airtightness.

¹<https://kanaalz.knack.be/nieuws/start-up-komt-met-afbrekbare-koffiecapsules/video-normal-860047.html>

²See also <https://www.madeinvlaamsbrabant.be/nieuws/koffiebranderij-bioco-lanceert-ecologische-buidel/>; <https://www.biojournaal.nl/article/7029673/bio-koffie-nu-in-ecologische-pouch/>; <https://www.gezondverstandig.be/het-verhaal-van-een-liefdeskind-van-twee-koffieliefhebbers-met-een-passie-voor-duurzaamheid/>



Figure 1: Bioco's 8g% bio-based coffee pouches



Figure 2: Bioco's 100% bio-based and compostable coffee capsules

100% bio-based and compostable coffee capsules with a 'green ring' as visual cue

Jo De Temmerman (Co-Owner Bioco): "We started looking for a coffee capsule, which is industrially compostable but also very functionally performant. To find the combination of both is a true quest. But if the capsule would not work as it is supposed to, or if the coffee would taste bad, people would buy your coffee only once."

The coffee capsule in 2017 adopted by Bioco consists of PLA-material without GMOs (some of their customers ask for GMO-free certificates). The capsule stands out because of two features.

First, supplier Bio4Pack offers a capsule that is fully bio-based and compostable without compromising the quality of the coffee. Essential in that sense is to prevent coffee oxidation. Bio4Pack developed a patented technology for the membrane that seals the capsule. Making this membrane both bio-based compostable and air-tight is indeed the major challenge. The membrane developed by Bio4Pack combines cellulose and PLA in a specific weave structure. Cellulose in itself is porous and hence not airtight. PLA in itself would be too sturdy to enable perforation of the capsule. Additionally, an airtight capsule ensures that you can repackage in ecologic materials and do not have to take recourse to plastic or aluminium repackaging.



Figure 3: Coffee capsule from Bio4Pack with patented technology for the membrane that seals the capsule

Second, in the design of the capsules not only technological innovations but also eventual, individual consumer waste sorting practices were considered. Given correct waste sorting, collection and end-of life management is a critical component in the sustainability impact of the product, a green ring was added as a visual cue to signal industrial compostability and thus steer adequate waste sorting behaviour.

The innovative bio-based coffee capsule

The innovative bio-based and industrially compostable Nespresso-compatible coffee capsule is the result of close collaboration of Bio4Pack, specialist in the field of sustainable packaging, and Advanced Technology Innovations (ATI), a product innovator.³ Working with Koffiebranderij Peeze as launching customer in the Netherlands, the partners developed a sustainable alternative for Nespresso-type aluminium-based capsules. The plant-based single serve coffee capsule is manufactured from bio-based material (sugar) and is compostable after use in municipal waste streams.

In 2015 the product was launched and in the same year the innovation was awarded the Dutch Food Valley Award.⁴ In 2016 the innovation was a finalist in the Packaging Innovation Contest De Gouden Noot, one of the world's most competitive packaging innovation contests.⁵

Since 2015, the innovative product has been picked up by the rapidly growing market for coffee capsules. Bioco adopted them in 2017 whereas the Italian espresso giant Lavazza started using the capsules in the UK in 2019, at the same time announcing plans to replace its entire range of home use capsules with new eco-friendly ones.⁶

³<https://www.worldfoodinnovations.com/innovation/biobased-compostable-single-serve-coffee-capsules>

⁴<https://nlintheusa.com/food-valley-award-2015-finalists-announced>

⁵<https://www.en.nvc.nl/finalists-de-gouden-noot-2016/>

⁶<https://news.bio-based.eu/lavazza-launches-compostable-coffee-capsules/>; <https://www.theguardian.com/environment/2019/nov/04/better-latte-than-never-compostable-coffee-pods-go-on-sale>

The importance of being a small player in becoming a first mover

Dieter Vanackere (Founder, Co-Owner Bioco): “Being a small player we could decide not to pass on additional costs for bio-based packaging to the consumer. We did not want to give the consumer an excuse to opt for the cheaper but less ecological choice.”

Bioco’s radical choice for more sustainable packaging is intrinsically motivated, but also strategic: as a small player you must take a clear position to poach on bigger players’ territory.

But equally in terms of executing the uptake of bio-based pouches and coffee capsules, being small has its advantages. First, for bigger companies, supply of bio-based packaging may be a big question mark. And indeed, also Bioco must place orders way in advance because of feedstock issues, but as Dieter explains, “As a large company you cannot work with a delivery time of 12 weeks, but for us this does not pose a problem. We produce smaller volumes and can make sure to have sufficient packaging products in stock.”

Also, the impact of bio-based packaging on total cost price is huge – it accounts for approximately 10%. Nonetheless Bioco does not pass on this cost to consumers but partly allocates it as marketing cost, partly takes a lower margin. Again, within a larger company a choice that bold may not pass that easily

Lessons learned and take-home messages

Bioco has just one, major ‘learning lesson’ from its transition journey: if your motives are green washing, you will not come very far. Choosing for bio-based packaging is still an investment – “you will never get as much financial return compared to when sticking with conventional plastics”. Nonetheless, Bioco considers it the only right choice in the longer run. Indeed, since their switch they have not had a single complaint from their growing customer base.

Coffee capsules are here to stay. According to research by Halo, a British producer of compostable coffee capsules, every minute about 39,000 of these capsules are made worldwide, while up to 29,000 are dumped in landfill sites. Compostable coffee capsules do not only tally with actual industrial waste stream management and individual consumer behaviour – e.g. recycling still requires each capsule to be emptied first, thus imposing a hassle barrier – they can also be turned into a value-added product at the end of their life cycle, with the recirculation of nutrient-rich compost.⁷



⁷Kooduvalli, K. et al. (2020) Life Cycle Assessment of Compostable Coffee Pods: A US University Based Case Study, in: Scientific Reports 10