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HOW CAN ECO-PACKAGING BE PART OF THE SOLUTION FOR A GREENER PHARMA INDUSTRY?

Most of the big American and European pharma companies have set ambitious environmental protection plans and greenhouse gas emissions reduction targets by 2030. For most of them, environmental protection marks a new step forward into transparency and accountability with the publication of annual sustainability reports.

Sanofi[1], GSK[2], Novartis[3], Johnson & Johnson[4] and other pharma companies have adopted their own systematic "eco-packaging" approach for the development of new products, designed to reduce their packaging volumes and minimize the usage of plastics and aluminum.

Modifying pharma packaging is a challenging process in terms of drug safety and conservation, as well as regulatory requirements. Packaging protects pharma products from deterioration during storage, transportation, and distribution. Every packaging change requires the notification of regulatory bodies at regional or sometimes even national levels. Packaging companies consider pharma to be a demanding sector, on par with beauty & cosmetics and food & beverage.

This article investigates eco-packaging (also known as sustainable packaging) for the pharma industry, including primary packaging (blisters, tubes, vials, ampoules, syringes…) and secondary packaging (boxes, leaflets and labels, trays…)[5]. Eco-packaging covers:

- minimal and eco-friendly materials (from recycled sources, renewable, biodegradable, compostable, low impact raw materials),
- recyclability
- reusability
- minimal use of energy and water for production

[1] https://www.sanofi.com/dam/jcr:7319bc97-c9e5-4bac-a449-6c7eac99f1bf/Ecodesign.pdf
[2] https://www.gsk.com/en-gb/responsibility/environment/waste/rightsizing-our-tablet-packaging-to-reduce-carbon-emissions/
[3] https://www.novartis.com/esg/environmental-sustainability/waste
[4] https://www.jnj.com/about-jnj/policies-and-positions/our-position-on-sustainable-products-and-packaging
Primary packaging comes in direct contact with the product itself (in the Pharma industry blisters, tubes, vials, , ampoules, syringes); Secondary packaging is used to group a certain amount of products together into a cohesive unit that is easy to identify (in the Pharma industry a box with its notice and label, as well as trays, product separators and reinforcement); Tertiary packaging is also called bulk packaging or transit packaging (in the Pharma industry large cardboard boxes transferred on pallets for shipment and storage).

BLISTER PACKS COMBINING ALUMINUM AND PLASTICS ARE A MAJOR ISSUE, BUT NEW SOLUTIONS ARE EMERGING.

Medicines packaging waste volumes are overall a relatively marginal part of total household waste, compared to food & beverage or electrical equipment for example. In France, medicines held at home by households were estimated in 2020 at ~550 grams per capita[6] (of which ~200 grams of unused medicines!), meaning a weight of medicines packaging at ~200-300 grams per year per capita – just 1/1000 of total household waste volumes[7].

The issue is not only a matter of waste volumes but also the nature and the lack of recyclability of the Pharma packaging. Blisters have several proven advantages: visibility of the product, superior sealing properties, cost-effectiveness for mass production, and light weight for transportation. However, combining aluminum and plastics makes recyclability more difficult.

This issue is more critical in Europe than in North America, for historic reasons.

"In the United States, pills are likely to come in a bottle, while the European market tends to produce blister packs." - Roche[8]

"In 2021, European packaging in the healthcare category [are] ~ 50% in blister packaging [in value]." - Huhtamaki[9].

It originates from massive investments in European in blister machinery post World War II, and it is due to a preference of the health system in Europe for prescriptions in smaller quantities. Today, aging populations and the rising incidence of chronic diseases will likely increase blister volumes on both continents, partially closing the gap.

Lastly, a key incentive to find alternative materials to aluminum for pharma companies is the recent price increase of aluminum on global markets (+40% in a year, +100% compared to historic price).

Recent breakthroughs from packaging manufacturers may be a game changer:

- Amcor mono-material plastic recyclable blister "Amsky®" eliminates PVC[10] from packaging by using a polyethylene thermoform blister and lidding film. Amsky® has been in the testing phase since April 2021 with several Big Pharma companies, and an official launch is expected in the coming months.
- Huhtamaki recently launched a mono-material plastic recyclable blister lid; following its paper-based blister pack for tablets and capsules called "Push Tab®". Launched in July 2021, Push Tab® is made from sustainable FSC[11] paper and aims at replacing PVC and aluminum blisters.
- In 2021, Südpack Medica presented a thermoforming polypropylene-based film as a sustainable alternative to PVC/PVdC[12] blister materials.
- In August 2021, Klöckner Pentaplast launched kpNext®, a "recyclable PET[13] blister completely compatible with pharmaceutical manufacturing form, fill and seal equipment", suitable for curbside collection throughout the United States.

[6] https://www.cyclamed.org/wp-content/uploads/2021/06/Rapport-dactivite%CC%81-Cyclamed-2020-VDEF-BD.pdf
[7] for "ordures ménagères" based on ADEME definition
[8] https://www.healthcarepackaging.com/supplier-news/news/22275722/roche-roche-engineer-to-highlight-pharmas-opportunities-to-reinvent-packaging
[9] Huhtamaki is a Finnish Packaging manufacturer
[10] PVC: Polyvinyl chloride (see Table 1: "The seven types of plastics")
[11] FSC: Forest Stewardship Council
[12] PVdC: Polyvinylidene chloride - clear and flexible synthetic thermoplastic produced by the polymerization of vinylidene chloride, outstanding oxygen and moisture barrier properties comparable to metallized films. This makes PVDC ideal for household wrap and food, medical and pharmaceutical packaging
[13] PET: polyethylene terephthalate (see Table 1: "The seven types of plastics")

INITIATIVES OF ECO-DESIGN IN PHARMA ARE ALREADY THERE.

Consumer Healthcare is relatively advanced, with several large-scale initiatives. And over-the-counter drugs are also moving in the right direction with the reduction of plastics in non-blister packaging.

SECTORS	INITIATIVES
Consumer healthcare	• Johnson & Johnson – eco-packaging design on some cosmetics product lines (baby body lotions, shampoos) • GSK – paper packaging for some brands (Centrum®, Sensodyne®, Parodotax®) by joining Pulpex in March 2021
Over-the-counter drugs	• GSK – decrease by 20% of plastic in tablets Advil® bottles in the United States in April 2021

Initiatives also appear for highly regulated and sensitive products in terms of packaging and safety, such as biologics in pre-filled syringes or vials, or single-use surgical instruments. Those initiatives either target minimal and eco-friendly material or recyclability.

ECO DESIGN	INITIATIVES
Minimal and eco-friendly material	• Sanofi – commitment for 100% blister-free packaging by 2027 for vaccines leveraging full card box packs (following the example of VaxigripTetra®) • Novartis – reduction of PVC packaging of new pre-filled syringes • Johnson & Johnson – development of a pulp injection molding tray pack
Recyclability	• Johnson & Johnson – recycling of metal & plastic components of Ethicon single-use surgical instruments in Germany • Novartis – recycling of PVC blisters and caps from product line Lucentis® in France in collaboration with TerraCycle since September 2020

INSPIRATION COULD COME FROM THE BEAUTY & COSMETICS SECTOR.

The beauty & cosmetics sector proves very innovative in eco-packaging design and recycling. It is quickly generalizing pulp/paper-based packaging in multiple categories, even for relatively sensitive categories such as skincare. L'Oréal has been working with Albéa since 2019 on "paper-based" tubes, and La Roche-Posay was the first to launch this packaging for the Anthelios® line (sun protection). It also recently launched the Garnier "no-rinse" hair conditioners paper-based packaging and mono-material recyclable plastic cap.

This sector is also active in the domain of plastics packaging from recycled sources. L'Oréal is committed at a Group level to have 50% of the plastic used to be from recycled or biobased sources by 2025 (21% realized in 2021). LVMH and L'Oréal are developing refillable cosmetics products, limiting the amount of plastic packaging. L'Oréal is committed to having 100% of its plastic packaging refillable, reusable, recyclable or compostable by 2025 (39% realized in 2021).

As a proof of maturity, the industry is tightly monitoring and actively communicating on sustainability indicators, with packaging considered a major item. L'Oréal and 35 other cosmetics players even co-founded the EcoBeautyScore® consortium in February 2022 in partnership with Capgemini and Quantis[14]. In June 2021 Pierre Fabre launched its own socio-environmental "green impact index®" for cosmetic products (with an A-B-C-D scale).

Following the example of cosmetics companies including Beiersdorf and Estée Lauder, some pharma companies like GSK or Novartis are committed to the circular economy and joined the CE100 network of the Ellen MacArthur Foundation. We believe that these kinds of initiatives can be genuine accelerators.

CONCLUSION

At Capgemini, we can help Pharma companies in their eco-design approach, reassessing their relationships with packaging manufacturers to foster co-innovation in the domain of sustainability. We have extensive knowledge in the domain of alternative materials (including bioplastics), through our entities Cambridge Consultants and frog . Finding the right material and packaging is always a multi-factor combination, one that needs advanced and specific analysis in terms of materials properties, economics, and usage. We aim to eco-design the next generation of packaging, including design, life cycle analysis and sourcing. We can also guide industrial transformations and regulatory changes and validations, which are key to accelerating the go-to-market process. Finally, our consulting expertise in branding, communication and marketing can be decisive on these issues of eco-packaging and more generally of sustainability-at-large.

We believe that today is a perfect time to engage this deep transformation, driven by societal trends and recent technological breakthrough of the packaging industry.

[14] https://www.capgemini.com/fr-fr/2022/03/invent-ecobeautyscore-consortium/

[15] We have references in the redesign of cosmetics devices, at Alvadiem (a French company providing cosmetics products from apiculture - a reusable pump concept, allowing 77% impact reduction) and Biotherm® (part of L'Oréal Group - first in-store refill device for skincare cosmetics products).

TABLE 1: THE SEVEN TYPES OF PLASTICS*

* https://plasticoceans.org/7-types-of-plastic/

ACRONYM	FULL NAME	PROPERTIES & EXAMPLES OF COMMON USAGE
PET (or PETE)	Polyethylene terephthalate	Lightweight, strong, typically transparent. One of the most used plastics for food packaging and fabrics: beverage bottles (water, soft drinks), food bottles/jars (condiments, honey), polyester clothing or rope.
HDPE	High density polyethylene	Strong and resistant to moisture and chemicals. Used for milk cartons, detergent bottles, shampoo bottles, cereal box liners, toys, buckets, and building materials.
PVC	Polyvinyl chloride (or vinyl)	Hard and rigid plastic, used for blister packs, clear food packaging, plumbing pipes, credit cards, toys.
LDPE	Low density polyethylene	Softer, clearer, and more flexible version of HDPE. Used as a liner inside beverage cartons (milk, juices), plastic/cling film wrap, sandwich and bread bags, bubble wrap, garbage bags, grocery bags, beverage cups.
PP	Polypropylene	Used for prescription bottles, bottle caps, hot food containers, yogurt containers, packaging tape, disposable diapers.
PS	Polystyrene (= Styrofoam)	Rigid, low-cost, insulation properties. Used for cups, takeout food containers, shipping and product packaging, building insulation.
Other		

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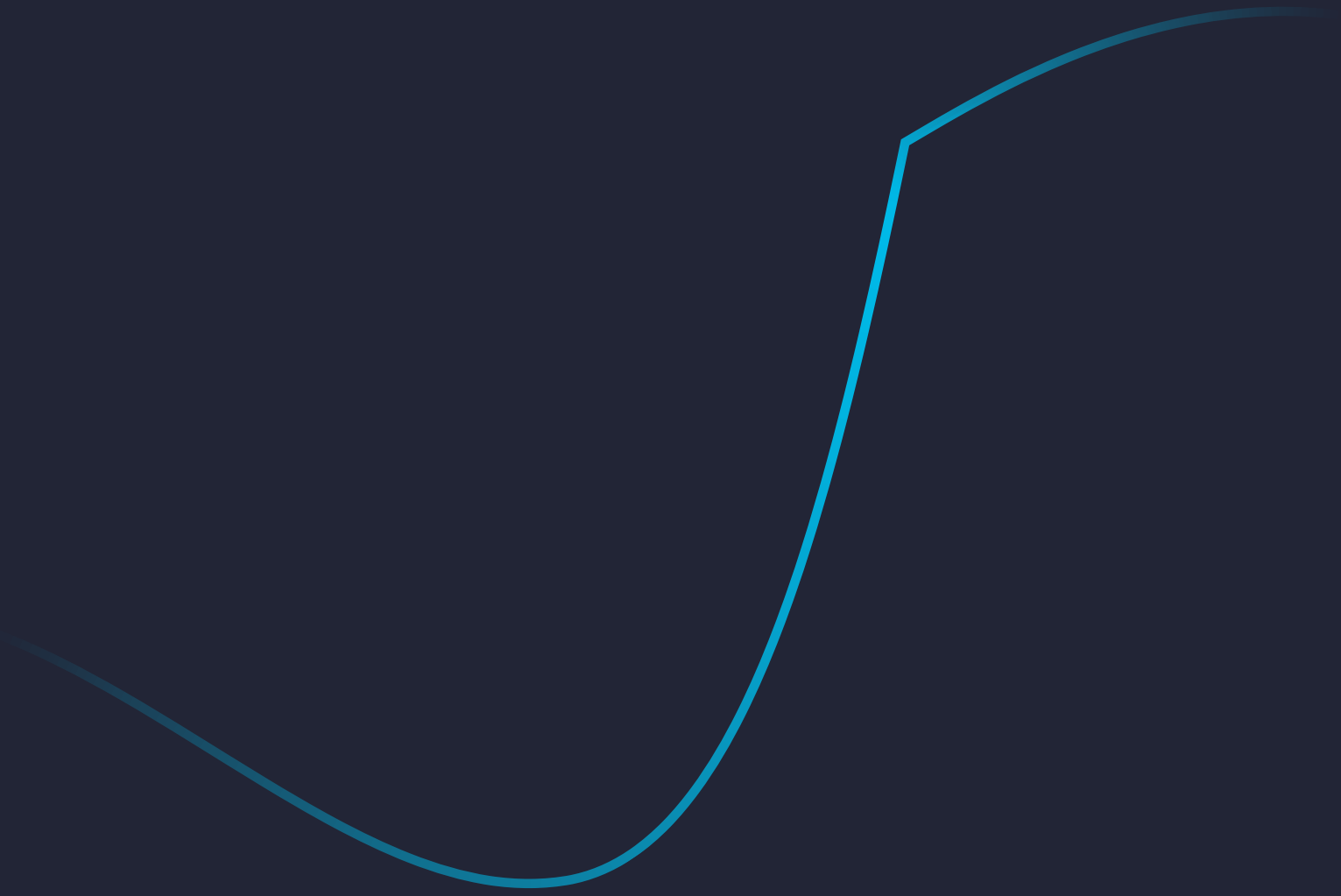

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