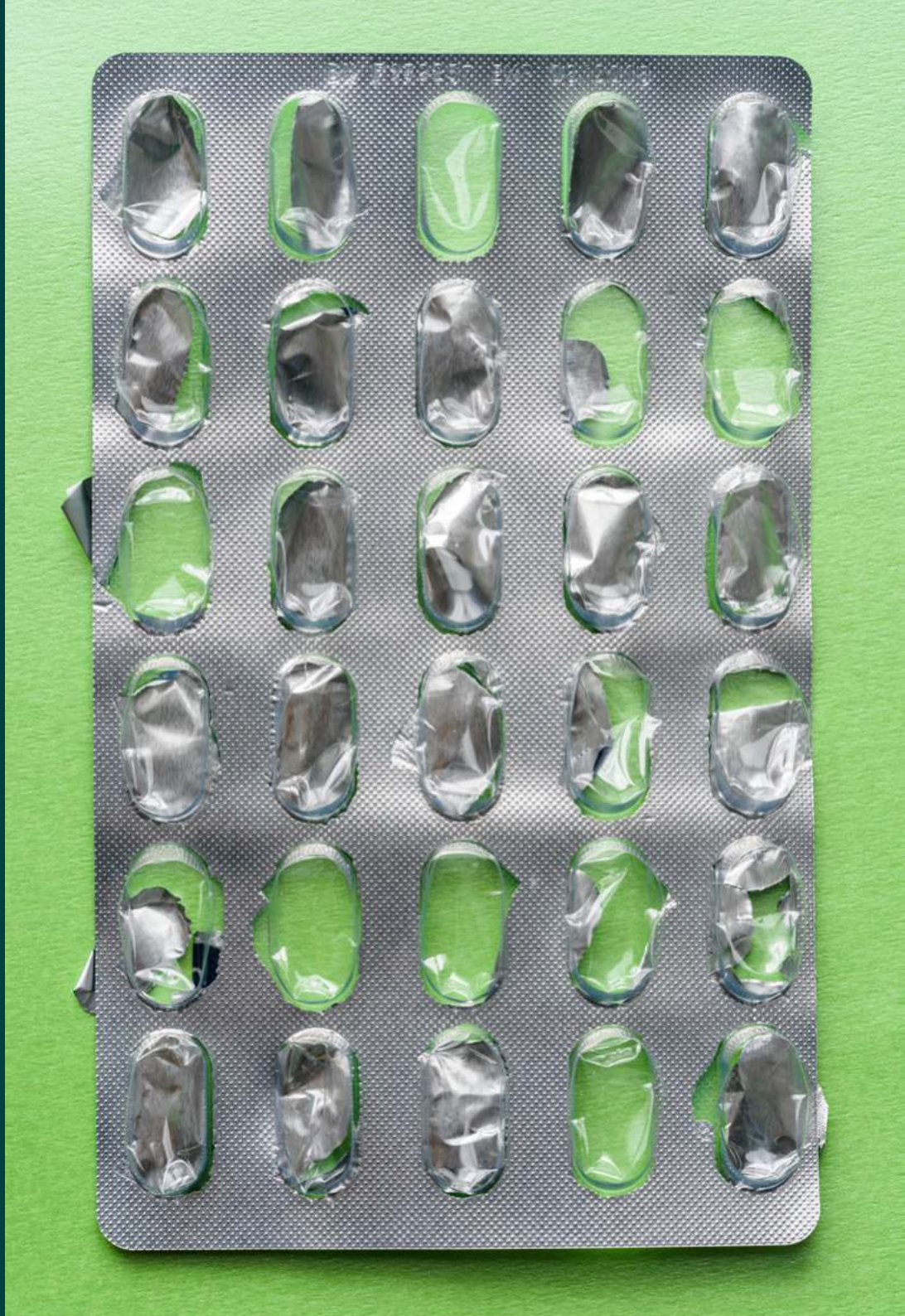
CPHI Online

CPHI Online Trend Report

Unpacking the True Cost of Sustainable Pharmaceutical Packaging



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Pharmaceutical packaging is witnessing its own boom in innovation as groundbreaking drug products push the industry forward. With increasingly specific packaging requirements from pharmaceutical products, numerous requirements for pharma packaging must be prioritised, including sustainability, patient accessibility, drug safety and efficacy, and time and cost of manufacturing.

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People, Planet, Profit: a balancing act

Achieving the optimal balance between time and cost, sustainability requirements, and patients is a complex decision to make. Aligning industry business priorities with external stakeholder priorities will require close collaboration between all.

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Contract packaging organisations that provide outsourced packaging expertise are increasingly in-demand. The question for pharmaceutical companies is one of both cost and finding the right partner.

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The future of pharmaceutical packaging is a top priority for the industry as a whole as it contends with sustainability regulations and patient priorities. The bottom line? The work must start now.

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Pharma feeling the pressure from sustainable packaging requirements

Though many regulations currently in place regulating product lifecycles and the recyclability of materials/recyclable content of packaging have yet to directly affect Pharma, the time to start prioritising sustainability was yesterday. It will take time and effort to fully transition drug products to appropriate packaging in-line with all pharma priorities.

Sustainable solutions for PVC blister packs leads innovations

One of the most mentioned technological innovations for pharma packaging relates to PVC blister packs, and developments towards 100% recycled materials for blister packs. With some markets banning PVC altogether, the arena is ripe for innovation on the blister pack stage.

Key takeaways 2/2

The price of relationships with contract packaging organisations

Contract packaging organisations not only provide cost-saving advantages and expertise in pharmaceutical packaging, but their true value lies in the collaborative relationships they foster among all stakeholders.

Collaboration is key

As with many important decisions in Pharma, achieving the Triple Bottom Line of People, Planet, and Profit will come only through dedicated collaboration and alignment of goals from all players involved in the pharmaceutical pipeline, from development through to packaging and transportation.

Pharma packaging priorities

Pharma packaging priorities

While innovations in the pharmaceutical industry are most often associated with groundbreaking drug products, pharmaceutical packaging is witnessing its own innovation boom. Important packaging considerations are forcing all involved in the pharmaceutical supply chain to reconsider their pharma packaging requirements. There is a delicate balance between sustainable pharmaceutical packaging, preserving drug product safety and efficacy, reducing time and cost of manufacture, and adhering to international regulations, among others. Factors such as these have led to a rise in interest in contract packaging organisations (CPOs) and contract partnerships to ease the strains of industry and consumer demands.

"There are many factors driving diverse interests in pharma packaging," states **Asmita Khanolkar, Senior Director at SMC Pharmaceutical Services, SMC Ltd.**

> **"New Emerging Needs like novel therapies, injectables, drug delivery devices, decentralisation from hospital to home care, and personalised medicine customer solutions are all driving growth in pharma packaging. Digitisation, Security, and Sustainability trends are generating new ideas and mindsets for packaging strategies. There is a need for innovative and specialty packaging based on the current and upcoming needs."**

Asmita Khanolkar
Senior Director at SMC Pharmaceutical Services, SMC Ltd.

However, the reality of actioning these needs may prove more difficult than anticipated.

"This is a challenge to answer because there is no simple answer," comments **Ton Knipscheer, Executive Director of the European Co-Packers Association (ECPA)**, when asked about the current interest in pharmaceutical packaging.

> **The pharmaceutical packaging market is a pretty closed market. It's very difficult to get into that market because of all the high demands (regulations, safety and efficacy etc.)."**

Ton Knipscheer
Executive Director of the European Co-Packers Association (ECPA)

However, the wider pharmaceutical industry needs to understand the impact of packaging considerations on overall operations to make the best decision for their company. The pharmaceutical packaging sector was estimated at over US$100 billion in 2022, and is expected to continue growing over the next decade[1]. "There is definitely pressure on the pharmaceutical packaging sector – whether to become more sustainable or innovate – and I'm sure the industry will step into this market eventually because the margins in

pharmaceutical packaging are much higher than food packaging," Knipscheer states.

To fully understand the scope of pharmaceutical packaging, this report dives into all considerations affecting pharmaceutical packaging like sustainability, patient safety, preservation of drug efficacy, and the rise of AI technologies in the supply chain, while balancing the costs (both in dollars and in time) associated.

Sustaining the environment and pharma packaging

Of the top discussed priorities for pharmaceutical packaging, sustainability remains the most ubiquitous. International regulations for plastics, waste reduction, and circular economies affects not just packaging, but the pharmaceutical industry as a whole.

71% of the medical industry's waste emissions, which includes the pharmaceutical sector, can be attributed to scope 3 emissions[2]. Scope 3 activities involve those critical to the pharmaceutical value chain but are not directly carried out by said industry, including transport and packaging[2]. Additionally, even though the global pharmaceutical packaging market is said to contribute a smaller portion of global waste by the World Health Organisation, this contribution might only go up, especially as the pharmaceutical packaging market is expected to grow by 6.1% annually up to 2027[2].

Sustainability goals and challenges for pharmaceutical packaging will also be different for primary, secondary, and tertiary packaging:

Primary: As this part of the packaging is in direct contact with the drug product, it is imperative that the materials used can maintain drug product safety and efficacy. For example, biobased materials, while an attractive and recyclable solution, often have low barrier performance and thus are not suitable to certain primary packaging purposes[3]. Some primary packaging choices like blister packs for oral pills are made with aluminium and plastic, which are usually non-recyclable.

Additionally, certain primary packaging units cannot be reused due to medical contamination[4]. Initiatives like the CiPPPA (Circularity in Primary Pharmaceutical Packaging Accelerator) aim to address the recyclability of primary pharmaceutical packaging. **Duncan Flack, Chairman of CiPPPA (Circularity in Primary Pharmaceutical Packaging Accelerator)**, explains that "Re-use is nigh on impossible because of patient safety, so the focus is applied to ensuring all materials are minimised to the lowest safe level, that they contain – where possible and allowed – recycled content, and that they are made from recyclable materials. Currently, there is very limited availability of any recycling capabilities for medicinal waste. This is why the launch of initiatives such as CiPPPA are so important to the industry."

Secondary: The most common forms of secondary clinical packaging and labelling include paper, boards, cartons, corrugated fibres, and boxes[5]. Regulatory requirements regarding leaflets and labelling and managing complex supply chains present unique challenges for secondary packaging considerations[6]. Multinational requirements can pose significant challenges regarding local languages and translations,

which play a crucial role in patient safety and adherence to dosage instructions[6]. Additionally, sustainability and environmental concerns remain a top priority – though paper leaflets and cardboard packaging may be considered less of a circular economic challenge, eco-friendly secondary packaging must still be balanced with maintaining drug safety and integrity, as well as cost concerns around sourcing and recycling[6].

Tertiary: All other pharmaceutical packaging fall under tertiary packaging, which protect both the primary and secondary packaging used[7]. These include materials used in handling, transportation, and external labelling[7]. While end-user use is not generally considered in tertiary packaging (as it is usually removed before a drug product is sold), there still exist considerations regarding selection of materials, cost-effectiveness, and, of course, sustainability[7].

While some of the biggest global pharmaceutical companies, such as Novartis, Pfizer, and GSK, tackle their own carbon neutrality, such companies are also focusing efforts on partnering with service providers with similar sustainability values. Not only does this reduce

said company's overall environmental impact, it also showcases to the wider industry a commitment towards collaborative sustainability and a positive reputation[8]. "Outsourcing packaging manufacturing and processing operations can impact sustainability decisions by providing access to specialised expertise and resources, enabling pharmaceutical companies to adopt more sustainable practices and materials," **Christoph Lewening, Business Development Manager at allpack group ag**, comments.

> **"CPOs often invest in cutting-edge technologies and processes that enhance efficiency and reduce environmental impact, thus contributing to overall sustainability efforts."**
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> **Christoph Lewening**
> Business Development Manager at allpack group ag

CPOs with their own sustainability initiatives add value to a pharmaceutical company in providing packaging expertise with the flexibility and scalability needed for sustainable pharmaceutical packaging[8].

Collaborations throughout the industry, including drugmakers, CDMOs/CROs, and CPOs, point to a larger movement within the industry in prioritising sustainability at every step of the supply chain.

Materials aside, the transportation of drug products and all related goods and services also impact industry sustainability efforts. "Changing out a thermoformed blister pack into a cold forming foil (CFF) blister pack increases the emissions associated with the product significantly," Flack exemplifies. "Equally, switching out of CFF and into a thermoformed product reduces emissions and has a net positive outcome for sustainability."

"Logistics has always been a challenge," **Georgina Tomás, Packaging Material Manager at Ferrer**, adds. "The product must travel and arrive in optimal conditions to the end consumer, whether those are patients, pharmacies, or hospitals. We have to take into consideration factors such as method of transport, destination, weather conditions, weight of content etc. In the food industry, returnable packaging is sometimes an option. Pharma does not currently have that option but I'm sure the industry will be talking about that soon.

The main questions are: How can we return packaging that travels to other countries/continents? What is least sustainable, carton paper or fossil fuels?"

Patients and pharmaceutical packaging priorities

Another rising concern for pharmaceutical packaging is patient/user-friendly packaging and labelling. Patients increasingly see themselves as active players in their own healthcare journey[9]. This includes the packaging of their medications. In an annual survey by global packaging company WestRock, 37% of consumers chose products based on packaging functionality[9]. While this may work for generics and/or over-the-counter (OTC) products, certain medications require specific packaging due to the drug formulations. In this instance, accommodating for patients becomes a challenge in balancing drug safety and efficacy, as well as sustainability concerns and waste reduction.

Patient concerns regarding packaging include:

1. Product integrity
2. Spillage/leakage-proof
3. Ease of use – opening, resealing etc.
4. Safety – child-resistant packaging

In an annual survey by global packaging company WestRock, 37% of consumers chose products based on packaging functionality[9].

For pharmaceutical companies, patient adherence is one of the top concerns when addressing patient-centric packaging. Poor adherence to prescription medications can lead to worsening of disease and unintended side effects/health risks[9]. Patient accessibility to their required medications can even be considered as a tenet of sustainability. "Packaging that makes it difficult for patients to access their medicine is not sustainable," states **Agnieszka van Batavia, Sustainability Manager Pharma Division at Constantia Flexibles International GmBH.**

"As treatments and therapies become more available and accessible, more people are using pharmaceutical products to improve their health or quality of life," adds **Sriman Banerjee, Head of Diagnostics, Software Devices & Packaging R&D Pharma Sci at Takeda Pharmaceuticals.**

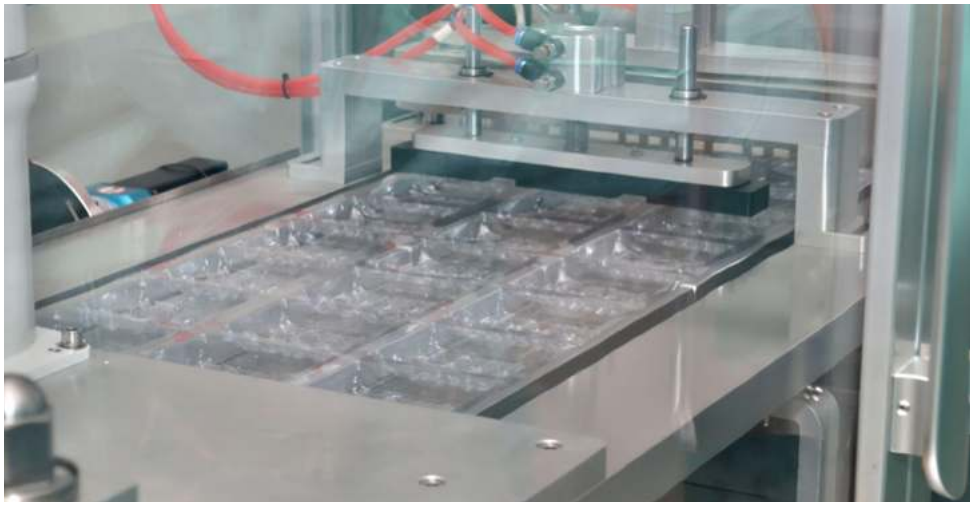
> **"Furthermore, while many of the treatments were restricted to healthcare centres with devices and combination products, the treatment can now be taken at in-home setting. With the increased use, we see an increase in engagement towards pharmaceutical packaging as it is the first touch point for patients for information and adherence."**

Sriman Banerjee
Head of Diagnostics, Software Devices & Packaging R&D Pharma Sci at Takeda Pharmaceuticals

While innovations aimed at increasing adherence and simplifying the patient experience are in development – smart packaging to track medication taken and QR-enabled labelling to name a few – the issue of adherence remains a top concern for healthcare providers, patients, pharma companies, and packaging experts alike.

Time-to-market and supply chain management

While not unique to the pharmaceutical packaging sector, time-to-market is still an issue at the forefront of the industry's mind. For pharmaceutical packaging, key aspects such as standardised packaging and machine compatibility must be considered when optimising operations and accelerating time-to-market[10]. Increasing a product's time-to-market – including its packaging – can mean the all the difference in costs to the company.



The pharma packaging sector itself is a highly segmented process with several steps involving different stakeholders and specialists[11]. From labelling project managers, conceptual packaging development, graphics and proofreading, transportation, and supply and procurement of materials required to manufacture the packaging, it is essential for packaging companies to determine which step in their processes can be optimised to improve speed-to-market.

In this regard, working with a contract packaging organisation (CPO) may provide some reprieve in functionality and expertise.

> **"It is a financial incentive for sure, but what I think plays a more important role is time-to-market."**
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> 
>
> **Ton Knipscheer**
> Executive Director of the European Co-Packers Association (ECPA)

"The time-to-market is getting shorter, and the amount of stock keeping units (SKUs) is growing with the complexity of certifications. Instead of running long production runs

of one SKU, companies are having to change every line maybe twice a day. This is where mass producers are usually not very well equipped to produce in bulk – if they have to put in a blister pack for the German market, a carton for the French market, and something else for the African market, it becomes very complex. This is why contract packagers and manufacturers are used."

Khanolkar comments that "The biggest benefits of working with a CPO is speed-to-clinic and commercial. The CPO will typically have a variety of packaging requirements, which can ease the pressures on the program, does not require investment of initial capital, and offers timeline savings. For smaller biotech or start-up companies, the CPO provides a quick solution to realisation of the product. For larger established pharma organisations, the CPO provides options to outsource packaging and maintain key technologies and intellectual property in-house."

However, a good contract partner also comes with a cost, one that must be balanced with those incurred when considering all other development and manufacturing aspects.

People, Planet, Profit: a balancing act

People, Planet, Profit: a balancing act

The ultimate balance for the pharmaceutical packaging sector will be one struck between sustainable materials and operations, patient safety and accessibility, and time and monetary costs to all stakeholders. However, pharma packaging is not without its challenges in this regard. “There were hardly any legal requirements applicable to pharma packaging,” van Batavia states. “It has always been the responsibility of the pharmaceutical manufacturers to establish which packaging material delivers the best and the most stable performance for a safe, secure, and efficient drug delivery. Hence, the choice of packaging strategy in the pharmaceutical industry was often purely based on functional criteria.”

“Pharmaceutical companies are a strong and consolidated, in Catalonia especially, as a community

with the most laboratories in Spain," explains Tomás "Pharmaceuticals have worked under the following assumption – if it has worked until now, why is it necessary to change? Recently, we have realised that we live in a changing environment due to many different socio-cultural factors (the pandemic, global warming, changing consumption styles, supply crises, technological innovations, and new anticounterfeiting regulations to name a few)."

While regulations for pharmaceutical packaging most often stress safety and efficacy of an active medicinal product, the long-term environmental effects have only just started to surface[4]. "The world around us is changing. Business as usual doesn't exist anymore," urges van Batavia.

> **"Sustainable packaging is no longer a consumer goods domain. The pressure comes partially from legislation, but NGO's and consumers are also starting to voice their concerns about the negative impact that healthcare has on the planet."**
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> **Agnieszka van Batavia**
> Sustainability Manager Pharma Division – Constantia

"The pharmaceutical sector is being forced to initiate the change, and one of the most important vehicles to achieving this is packaging," summarises Tomás.

The monetary cost of sustainability

Perhaps the most important consideration for a pharmaceutical business is the upfront cost and long-term profit and/or savings when making any business decision. While aspects such as transportation costs, material demand and shortages, and manufacturer expertise are cited as contributing factors to increased costs, recycled materials are still more expensive than materials currently in use[12]. In fact, sustainable packaging materials can be up to 50% more expensive than regular packaging materials[12]. This is in part to manufacturing, research, and production costs that are not at scale with what is required, and the need for renewable energy sources that cost more money[12].

Contamination also limits the recyclability of drugs delivered intravenously or through injections, and impurities in materials could have damaging health consequences for consumers[13].

Current and upcoming regulations, whether national or global, also place a cost strain on pharmaceutical companies operating around the world[13]. Flack explains, "Because of the increased influence of the likes of the PPWR and the UK Plastic Packaging tax, Carbon Border tax, and the like, packaging, and in particular plastic packaging, are increasingly under the microscope."

The European Green Deal, for example, aims to make Europe the first climate-neutral continent by 2050[13]. Non-compliance with such initiatives or cross-country regulations could leave to hefty fines for companies involved. The German Packaging Act (VerpackG) affects commercially active packaging importers and retailers, and requires the registration of a dual reporting system[14]. Non-compliance could result in a EUR €20,000 fine[14]. These legislations also apply to other industries utilising single-use packaging, and pharmaceuticals have historically been omitted from the discussion due to concerns around patient safety and drug efficacy.

"Pharmaceutical packaging development is guided and approved by regulatory agencies."

Sriman Banerjee
Head of Diagnostics, Software Devices & Packaging R&D Pharma Sci at Takeda Pharmaceuticals

"It is imperative that the RA guidelines, Pharmacopeia, ISO, ASTM, and other standards are followed to ensure the safety and efficacy of the drug product during its shelf life. Given the current regulations, while there are challenges to the use of recycled materials for primary packaging, there exists a pathway for a lower carbon footprint with glass vials, plastics etc. and the industry is working towards that. For secondary and tertiary packaging, the industry is already moving towards the use of source certified paper, e-leaflets, and other initiatives to reduce use of packaging materials."

Knipscheer adds, "The testing procedures for pharmaceutical packaging are very strict both around consumer safety and efficacy. Changing packaging requires a long time – 5–7 years at best – and that, of course, comes with a high cost associated. Changing something in the packaging material to be more

sustainable is something not all pharmaceutical producers might be keen on without an incentive, whether that is cost-driven or legislation driven."

The cost to, of, and for patients

When seen from a patient perspective, pharmaceutical packaging must consider aspects like ease of use, accessibility, and, increasingly, sustainability. Patients are particularly interested in aligning all aspects of their pharmaceutical products with consumer demands[15]. "Heightened patient awareness and expectations regarding sustainability and environmental impact have driven discussions and initiatives in the pharmaceutical packaging landscape," comments Lewening.

Pharmaceutical companies are now implementing the patient voice throughout their operations, including packaging considerations, chief among these are packaging needs for rare disease and ATMP products. Khanolkar cautions. "The pharmaceutical industry is seeing some challenges for filling capacities, and setting up new capacities can take substantial effort, capital,

and time." As previously mentioned, the issue of patient adherence remains a concern for the pharmaceutical industry, with packaging a key player in increasing adherence. Growth in the biosimilars and biologics space will also be placing more pressure on pharmaceutical companies and their packaging partners to ramp up capacity and expertise to meet these demands.

Additionally, with many nations facing an ageing population, pharmaceutical packaging is facing pressure to develop accessible packaging for senior citizens who regularly take medication[16]. With the UN predicting that almost 426 million people worldwide will be over the age of 80 by 2050, pharma packaging must account for this population[16]. Solutions for senior-friendly packaging

can include printed QR codes linking to digital and audio instructions for administration, wireless monitoring to track usage, and even technologies in current use, like push and twist lids or those that utilise two consecutive motions[17]. These solutions are both child-resistant and senior-friendly[17].

Digital solutions can also help alleviate some sustainability concerns without imparting a monetary cost on the patient[17]. Intelligent technology can be easily integrated into existing packaging. This issue then becomes one of patient education provided by healthcare practitioners and easily accessible information[17].

The bottom line

With all aspects considered, pharmaceutical companies must contend with a number of opposing priorities. Pharma decision-makers may be at a loss of how to achieve the best balance for all stakeholders.

> **"Achieving a balance between regulatory, sustainability, and patient-centric priorities for pharma packaging involves integrating these considerations into the entire product development and packaging lifecycle. This includes conducting comprehensive risk assessments, stakeholder engagement, and lifecycle analyses to identify trade-offs and optimize packaging solutions that meet diverse requirements while managing costs effectively."**

Christoph Lewening
Business Development Manager at allpack group ag

Flack echoes these sentiments. "By ensuring the industry aligns and collaborates, unifying their approach, and

aligning their ambitions with their requirements make change much easier to achieve," he states. "It's more a case of the regulators understanding the needs of the industry and sustainability, and working to accommodate those needs. For example, allowing for chemical recycling of PIR and PCR and categorising the recycle as feedstock, not waste."

> **"There are circumstances where the cost can be balanced alongside regulations, sustainability, and patient-centric solutions, and there will be circumstances where this may not be the case,**
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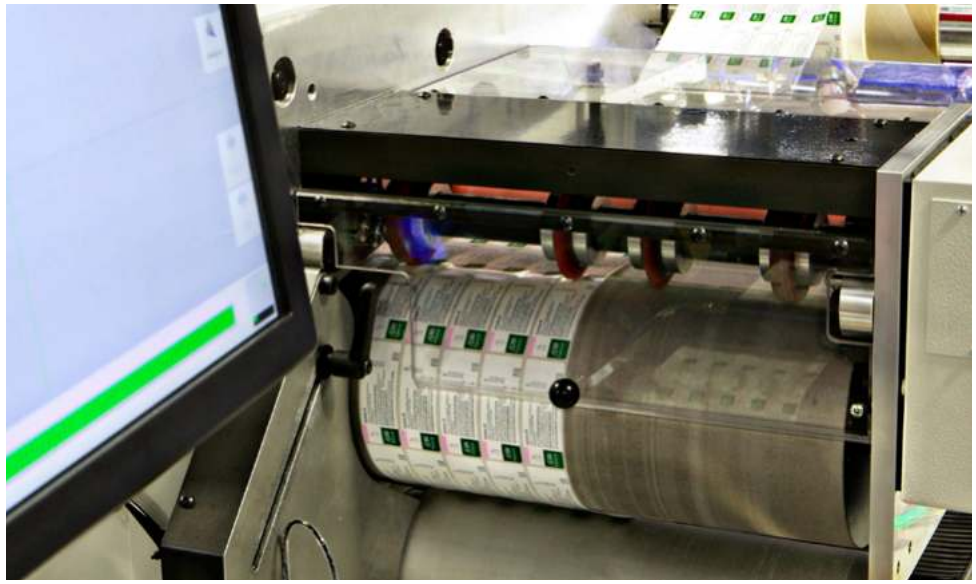
> **Sriman Banerjee**
> Head of Diagnostics, Software Devices & Packaging R&D Pharma Sci at Takeda Pharmaceuticals

"Packaging must also be seen in context of use – what may work in a hospital setting may not be useful for in-home consumption. Geography of availability and tailored packaging are also important. The industry has been working towards responsible use of packaging balanced with said requirements."

Packaging technology challenges and solutions

The unique challenges for pharmaceutical packaging is pushing all stakeholders to innovate and develop suitable pharma packaging without compromising on key requirements[18]. From biodegradable alternatives to inhalers with lower contributions of propellant gases, the industry is already tackling issues of sustainability with innovation[18].



"Emerging technologies and packaging solutions are addressing the numerous priorities of the pharma industry by leveraging advancements in materials science, digitalisation, and automation," Lewening says.

> **"Examples include smart packaging with embedded sensors for real-time monitoring, polyolefin materials for sustainable blister packaging, and innovative manufacturing processes for cost-effective production."**

Christoph Lewening
Business Development Manager at allpack group ag

"It is challenging to adopt new packaging specifications for pharmaceutical companies," van Batavia explains. "With the introduction of low carbon aluminium, we have revolutionised the high-barrier blisters portfolio by offering up to a 30% reduction in carbon footprint without any trade-offs. Because the alloy composition remains the same, there is no change to the specification of the final packaging material. There is no need for time-consuming stability testing or costly revisions of the drug master file. Avoiding those revision costs balances a relatively small green premium that low carbon aluminium comes with."

PVC blister packs are among the most discussed when it comes to updating existing packaging technology. For example, the Blister Pack Collective, from consultancies PA and PulPac, was established to create the world's first planet-friendly Dry Molded Fiber tablet blister pack[19]. The initiative aims to offer pharmaceutical companies and partners an opportunity to accelerate the development of this technology[19].

Sustainability Hub at Pharmapack 2024

Tomás adds to the conversation on PVC's, and how economic incentives in other areas can ease the transition to more costly packaging alternatives.

> **"Replacing PVC for 100% recycled PS, or the use of post-industrial plastic and aluminium, mono-material blisters, eliminating layers in complexes, using recycled paper from sustainable forests – these are all biodegradable materials but they remain in doubt."**

Georgina Tomás
Packaging Material Manager – Ferrer

"Obviously, all these proposals have added costs. The demand for sustainable materials in the pharmaceutical sector is not enough to make them competitive. Thus, these increases in cost will be assumed by product or fixed in retail prices. On the other hand, dematerialization is a strategy that can be beneficial to everyone. Eliminating leaflets, using QR technology, reducing grammages, and reducing air transport can contribute to an economic and environmental benefit for everyone."

van Batavia also comments on what companies and their partners can do to balance these demands: "A pressing demand for pharma packaging is moving out of PVC and other halogens in both CFFs and thermoform blister systems. There are no technical and/or environmental arguments against a switch to more future-proof materials. The only arguments in favour of keeping the status quo are economical. This is where applying a Triple Bottom Line framework – often referred to as 'People-Planet-Profit' approach – can be helpful. Accounting for the social and environmental value creation in addition to the economic factors is likely to tip the balance towards solutions that are healthier for people and planet."

"Note that most developments are not just a material change; the entire ecosystem needs to be developed, including equipment, molds etc., not to mention stability," Banerjee adds. "In most circumstances, this comes with a cost and, depending on the modality, the impact. Furthermore, the industry consortiums help by pooling resources."

The role (and cost) of contract packaging organisations

The role (and cost) of contract packaging organisations

The heightened awareness of pharmaceutical packaging have brought increased attention to CPOs and outsourcing packaging needs. CPOs can offer expertise in selecting optimised packaging materials that are recyclable or otherwise sustainable[20]. The right outsourcing partner can also provide collaborative industry practices and energy efficiency throughout the supply chain, advocate for sustainable practices, and give access to innovative technologies and operations[20].

“CPOs are typically very nimble and work well with smaller batches of drugs that require packing,” says Flack. “They can certainly influence the choice of packaging material,

and ensuring they are aware of the latest developments/ technologies, capabilities etc. is a vital role int he sale and promotion of packaging material manufacturers. By training and upskilling their staff, packaging manufacturers can ensure their products are used to the best possible effect, and as widely as possible."

> **"Depending on the length of the relationship, CPOs will also invest in the production and facilities for the product. Some contract manufacturers might prefer packaging partners who do all the outsourcing, all the production, and everything around it – including shipping, distribution, storage, hauling, cooling warehouses etc."**
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> 
>
> **Ton Knipscheer**
> Executive Director of the European Co-Packers Association (ECPA)

He also emphasises the importance of the relationship between CPOs and pharmaceutical, one that is just as if not more important than the sustainability expertise brought by CPOs. "For over-the-counter products, where price is critical, a third-party manufacturer can be a good solution to maintain the margins because they can switch from one production line to another without having to facilitate the capital for a particular product. There will be brand owners who will always shop around and go from one packaging partner to another, thinking they can maintain the lowest possible cost. But in reality, they will not build a relationship. The market for these products for contract packaging is relatively small – there are more contract packager who can fill pet food products than pharmaceutical products because it is a much more specifical and controlled market. This can come back to bite them if they continue to shop around for the least expensive partner. So maintaining that relationship is essential."

Specifically regarding potential cost alleviating benefits of partnering with a CPO, Tomás adds that "Outsourcing any service needs an accurate diagnosis. The company will need to evaluate costs and make a detailed business case," she advises. "To make it easier, it is not the same to outsource any process on generic drugs with little margin profits that make a large amount of sales compared to branded prescription medications that have another type

of selling approach. In that sense, the company must think about sales, margins, production costs, and returns. The economic impact will thus depend on the type of product, the infrastructure companies have, and the business done with the CPO."

Lewening offers a more sustainability-focused perspective to the case for outsourcing packaging needs to a CPO.

> **"Outsourcing packaging manufacturing and processing operations can impact sustainability decisions by providing access to specialised expertise and resources, enabling pharmaceutical companies to adopt more sustainable practices and materials."**

Christoph Lewening
Business Development Manager at allpack group ag

"CPOs often invest in cutting-edge technologies and processes that enhance efficiency and reduce environmental impact, thus contributing to overall sustainability efforts. Balancing sustainability with costs requires careful consideration of factors such as material selection, design optimization, process efficiency, and supply chain management to achieve sustainable outcomes without compromising product quality or affordability."

Packing it all together

Packing it all together

Uncovering the true cost of pharmaceutical packaging, when considering non-negotiable aspects as sustainability, patient accessibility, and product safety and efficacy, can be daunting when attempting to balance all the issues above. But with the right decision-makers and an unwavering commitment to all important aspects, a balance can be found.

"All industries have a history of evolution as science and technology evolve, which includes diagnosis and diagnostic capabilities," Banerjee says. "Alongside dosage forms, packaging has also evolved to complement the requirements with cryogenic packaging, titration packs etc. Needless to say, sustainability and patient centricity remain at the core of current pharmaceutical packaging."

"Currently, we live in the so-called 'packaging industry 4.0'. Intelligent packaging guarantees product traceability and logistics throughout a product's lifecycle," Tomás adds. "Packaging designs are created not only to generate emotions, they are also made to differentiate from competitors. Markets become demanding, requiring innovation and research of more resistant, lighter, recyclable, reusable, and biodegradable materials. Companies must comply with sustainable standards and forced to change from single-use materials with fees."

Flack concludes with a bit of pressure for the industry:

> **"Sustainability criteria currently requires 100% recyclable materials and minimum of 30% recycled content, all while not increasing costs for either the materials used or upgrades for machinery used to pack the products. While Pharma has an exception until December 31, 2034, it will take a very long time to transition all drugs into new packaging formats. As such, the work needs to start now."**

Contributors

Many thanks to our expert contributors!

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