



# INTERGRAF PACKAGING MARKET REPORT

2023







## FOREWORD

Europe's packaging sector is growing and readying itself for change as it responds to new legislation, like the proposed **EU Packaging and Packaging Waste Regulation**.

Bringing together people from across the packaging supply chain helps to inform the industry's response to complex issues and speed up the transitions needed at company level. Intergraf is pleased to offer such a platform at our events.

**Intergraf** is the European trade association representing employers in the graphical sector. We have 22 member associations from 21 countries, as well as 11 associate members. We work closely with the European Union - and many other European associations, networks, and platforms - to promote, protect, and enhance the printing industry's competitiveness through lobbying, informing, and networking.

Close to 120 people from 18 countries joined our conference **Shaping the Future with Packaging** on 9 and 10 March 2023. Intergraf organised this event in collaboration with FTA Europe and Smithers. It was also supported by 6 gold sponsors and 5 silver sponsors.

**Shaping the Future with Print** is an event series by **Intergraf**, the association representing the European printing industry. Each edition focuses on a different sub-sector of the graphical sector. As well as packaging, in the past, this has included books, direct mail, magazines, and commercial print.

**Part 1** of this report gives an overview of the information presented at **Shaping the Future with Packaging**. One of the speakers was Smithers, who summarised their market data and recommendations (prepared exclusively for this event). You will find Smithers' market data in **Part 2**.

I hope that you find this report useful. **Happy reading!**



Beatrice Klose

Secretary General of Intergraf





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**PART 1.**  
SHAPING THE FUTURE  
WITH PACKAGING

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## **PACKAGING CONFERENCE 2023**

### **SPEAKERS**

**Tom Hallam, Smithers**

European packaging market: the latest data

**Maja Desgrées du Loû, European Commission (DG Environment)**

The new EU Packaging and Packaging Waste Regulation

**Francisco Nogueira, The Coca-Cola Company**

World Without Waste

**Susanne Lippitsch, SL Design**

Opportunities and challenges from the perspective of a packaging designer

**Jan 't Hart, AIM (European Brands Association)**

Recycling - presenting the watermark 'HolyGrail 2.0'

**Peter Ragaert, Pack4Food and Ghent University**

Sustainability of food packaging - a multidisciplinary approach

**Olga Munroe, The Retail Institute (Leeds Beckett University)**

Sustainable strategies of UK retailers – case study

*Conference moderated by **Joanna Stephenson**, Founder of PHD Marketing*

*Welcome address given by **Jesper Jungersen**, Vice President of Intergraf*

*Welcome address given by **Sante Conselvan**, President of FTA Europe*

## PART 1.1. KEY TRENDS

### European packaging market: the latest data

Tom Hallam, Smithers

Tom presented the latest European packaging market research carried out by Smithers. Turn to page 16 for the full market report.

According to Tom, there are five central drivers of change in the packaging market.

#### 1. Sustainability

*“We’ve all got to reduce our reliance on fossil fuels - that’s clear,”* said Tom. One way companies are working towards this is by focusing on the UN Sustainable Development Goals (SDGs). Targets most often relate to waste reduction and emissions.

Tom highlighted the need for printers to *“be prepared!”* to provide more information upstream. *“If you’re a plastic packaging supplier, you must make sure you can supply packaging that meets recyclability standards.”* He also noted that *“scope 3 [of the Greenhouse Gas Protocol] is an area people must pay much more attention to”*. Scope 3 encompasses emissions that are not produced by the company itself, instead focusing on the whole supply chain.

As well as proving their carbon footprint, companies will also have to prove their environmental claims. *“Greenwashing will be far more policed going forward. Producers will have to ensure that claims can be properly backed up.”*



#### 2. Growth in e-commerce

Smart devices are driving the “mega-trend” of e-commerce growth. Consumer behaviour and expectations are also changing, as are the markets. *“Asia Pacific has half of the market for packaging (mostly China, South Korea and Japan). But other markets [like America] are starting to catch up.”*

#### 3. Consumer trends and lifestyles

*“The consumer is changing. They have more knowledge on environmental issues than ever before, and they are making purchasing decisions based on this.”* For example, they *“want to get rid of unnecessary plastic”* and for their packaging to be fully recyclable.

#### 4. Packaging automation and digitalisation

Eliminating void space in packaging is an important activity, and there are now automated ‘fit-to-size’ box making machines. *“These machines are a real threat to people who produce pre-made bags.”*

#### 5. Packaging innovation

Developments that get rid of unnecessary packaging are underway - such as dry-molded pulp using pulpac technology. This is *“an interesting area to keep our attention on.”*

*“Greenwashing will be far more policed going forward. Producers will have to ensure that claims can be properly backed up.”*

Tom Hallam



## The new EU Packaging and Packaging Waste Regulation

Maja Desgrées du Loû, European Commission (DG Environment)

All speakers mentioned the European Commission's proposed Packaging and Packaging Waste Regulation (PPWR) as an important driver of change for the packaging industry because compliance will be mandatory.

The PPWR proposal was presented by Maja Desgrées du Loû, a Commission official involved in its drafting. A final text is due to be adopted in March 2024 after discussion between Member States and the European Parliament.

With the PPWR, the European Commission aims to reduce packaging waste, and increase the amount of plastic packaging that is incorporated back into secondary materials (primarily through recycling). According to Maja, *"the current situation is creating barriers to the internal market and trade."*

Maja noted that *"packaging waste grows regardless of the growth of the economy."* If nothing was done, packaging waste *"would continue to grow by an estimated 40% by 2030."*

The PPWR contains obligations for Member States, as well as harmonised measures that will be directly applicable to economic operators - including some sector-specific targets.

Measures include national packaging waste reduction targets, minimising unnecessary

packaging, and imposing re-use and refill targets on economic operators by sector and packaging type.

By 2030, it is envisaged that all packaging brought onto the market is recyclable. Ambitious targets for 2030 and 2040 have also been set for packaging containing plastic parts.

However, Maja noted that *"targets are not as horrible as they may seem"* because *"we envisage a lot of exemptions - for example, for micro companies."* Exemptions will come in the form of Delegated and Implementing Acts.

There will also be further Delegated Acts *"to define what recyclability actually is based on its technical recyclability and design for recycling criteria."*

The Commission will also focus on the capacity of the market to recycle materials. If there are not enough recycled materials available to meet the set targets, exemptions will be made.

As well as recycling, re-use and refill targets for industry are covered. These *"are not hard targets, but we would like to encourage as much re-use/refill innovations as possible,"* explained Maja.



*"Without this regulation, packaging waste would continue to grow"*

Maja Desgrées du Loû

## PART 1.2. THE PRODUCT LIFE-CYCLE

### World Without Waste

#### Francisco Nogueira, The Coca-Cola Company

Coca-Cola is one of the best known brands in the world. Actions taken by The Coca-Cola Company on sustainability show where the industry is heading.

Francisco Nogueira, Packaging Innovation Manager at The Coca-Cola Company, presented their global vision for sustainability: World Without Waste. He clarified that *“Coca-Cola recognises that there is a waste problem in the world and we want to be a part of solving that problem.”*

Ultimately, *“zero waste and net zero emissions is the end goal”* for Coca-Cola and their work on sustainability. Achieving this is complicated, but *“what we’re trying to do is the right thing.”*

Targets of World Without Waste are threefold:

#### 1. Design: Remove, Reduce, Reuse.

By 2025, The Coca-Cola Company aims that 100% of its packaging will be recyclable, and that 3 million tonnes of virgin plastic from non-renewable sources will be eliminated.

By 2030, they aim for 50% recycled materials to be used, and 25% of their volume to be offered in reusable packaging.

To achieve these targets, they are focusing on reducing the amount of plastic used in each bottle, enhancing the recyclability of plastic used, increasing the use of recycled and plant-based

materials, investing in solutions that will reduce packaging, and fostering innovation (such as with the paper bottle).

Francisco explained that *“We try to create the right strategies and technologies to take it to the next level.”*

#### 2. Collect: Sell one. Collect one.

Returnable packaging and infrastructure is the focus of this target. By 2030, The Coca-Cola Company aims to collect and recycle one bottle or can for each one that is sold.

#### 3. Partner: Engage partners.

The Coca-Cola Company aims to bring their suppliers and the wider industry together to look for innovative solutions. To use their brands to reach consumers and raise awareness. And to partner with other organisations on marine litter and recycling solutions.



*“Coca-Cola recognises that there is a waste problem in the world and wants to be part of solving that problem”*

Francisco Nogueira



## Opportunities and challenges from the perspective of a packaging designer

Susanne Lippitsch, SL Design

Packaging designers work with brand owners to create packaging that enhances the product it is designed for.

*“Packaging design has to fulfil many different functions,” explained Susanne, “and it’s often difficult to ensure it meets all of these requirements.” “Packaging should protect the product, be functional, be emotional, and be sustainable.”* As well as this, designers need to remember that *“packaging is a communication tool and should communicate on its own.”*

From the consumer’s perspective, packaging must *“be convenient”* and *“provide an unpacking experience that appeals to many senses”* because this is *“an emotional moment.”* Susanne explained that *“when I start to design a piece of packaging, I think about the unpacking experience and emotional reaction of each customer.”*

Emotional responses are *“what the brands want,”* explained Susanne. This is because *“strong branding creates more brain activity,”* creating instinctual reactions. *“Packaging is brand.”*

Consumers want to be entertained, addressed personally, positively surprised, and to get a good feeling. Brands try to achieve this with their packaging.

Consumers also increasingly want sustainable packaging solutions. However, brands have to consider how to balance this with costs.

According to Susanne, some of the key trends to watch out for in packaging design are:

- hybrid solutions (a mix of reusable and refillable)
- minimum use of materials
- generally less packaging
- packaging that becomes part of the product
- the continued major role of plastic
- the use of mono materials and reduction of material diversity
- enhanced focus on the circular economy
- standardisation (like the iPhone connector)
- simplified reusability



*“Packaging should appeal to as many senses as possible”*

Susanne Lippitsch

## Recycling - presenting the watermark 'HolyGrail 2.0'

Jan 't Hart, AIM (European Brands Association)

An important part of the life-cycle of any piece of packaging is recycling. One innovation aiming to improve the recyclability of packaging, HolyGrail 2.0, was presented by Jan 't Hart, representative of AIM, the European Brands Association.

HolyGrail 2.0 is an advanced sorting system based on a digital watermark that is added to packaging products in the design phase.

Jan explained that *“the pattern of the watermark is incorporated into the packaging’s decoration, remaining invisible to the human eye”* - similar technology to a QR code. High resolution cameras can detect the watermark on packaging so that intelligent waste sorting machines can sort it into the correct streams.

The aim of the HolyGrail 2.0 pilot project is to assess whether such a pioneering piece of digital technology can *“enable better sorting and higher-quality recycling rates for packaging in the EU.”* It could play a role in the upcoming EU Packaging and Packaging Waste Regulation.

The project is driven by 160 members from across the packaging supply chain. After having successfully completed phases 1 (research) and 2 (testing in an industrial context), the project is currently in phase 3 (deploying a prototype in a large-scale pilot under standard operating conditions). This will continue

during 2023.

Project objectives are twofold.

### 1. Technical

Proving the technical viability of digital watermarking technologies through:

- Validating the prototype in three stages (research, industrial, and at scale);
- Ensuring readability of the watermark in different applications (e.g. print or plastic), while maintaining design and shelf appeal.

### 2. Economic

Proving the economic viability of digital watermarking technologies through:

- Reviewing existing and new business models, and building on key learnings from each test phase;
- Addressing main market barriers, and assessing similar technologies;
- Examining cost improvement potential of digital watermark detection systems;
- Perform a full analysis (including cost breakdown) for the full packaging supply chain.



*“The pattern of the watermark is incorporated into the packaging’s decoration, remaining invisible to the human eye”*

Jan 't Hart



## PART 1.3. EMERGING STRATEGIES

### Sustainability of food packaging - a multidisciplinary approach

Peter Ragaert, Pack4Food and Ghent University

According to Peter, food packaging is:

- **Functionality** (required shelf life, and reduced food loss)
- **Convenience** (portion packaging and intelligent packaging)
- **Sustainability** (reduce, reuse, recycle)

*“Packaging can play a role in reducing food loss,”* said Peter, because currently *“30% of food is wasted (50% of fruit and vegetables).”* At the same time, he noted, *“it should be convenient and use sustainable packaging materials as far as possible.”*

Innovation can help to solve the problem of food waste - and *“I’m excited about many packaging innovations in the market,”* said Peter. One he noted was *“coatings that are applied directly onto fruit or vegetables (sometimes, such coatings are even derived from the skin of that product itself).”*

The first main driver of innovation in the packaging industry is new regulations, such as the EU Single Use Plastics Directive, and the EU Packaging and Packaging Waste Regulation. The second driver is ecodesign (designing for sustainability).

Companies are increasingly looking to researchers for advice on how to improve their sustainability.

As a researcher, the three primary questions Peter is

asked by companies are:

1. Can we change from plastic to paper?
2. How can we find a balance between asking for more recycled materials/content and food contact legislation?
3. What other business models are there for better reuse?

The answers to these questions lie in developing the correct approach for consumers, logistics, and hygiene, according to Peter.

In conclusion, Peter confirmed that *“this sector is highly innovative”* and in a position to meet new regulations and developments with creativity.

His three key takeaways were:

1. Always consider the packaged product (product + package).
2. Aim for packaging optimisation (with all stakeholders in the packaging chain responsible).
3. Recycling = collection, sorting, and recycling.



*Currently, “30% of food is wasted (50% of fruit and vegetables). Packaging can play a role in reducing food loss.”*

Peter Ragaert

## Sustainable strategies of UK retailers – case study

Olga Munroe, The Retail Institute (Leeds Beckett University)

The Retail Institute recently conducted research into the current and future use of plastics packaging for a UK retailer. The aim was to support their reduction of plastic and move towards carbon neutrality. This research contained various important conclusions for the wider packaging industry.

Like some of the other speakers, Olga highlighted the importance of focusing on scope 3 of the Greenhouse Gas Protocol (demonstrating the carbon footprint of the full supply chain). There is still *“a bit of a disjoint”* on this across the sector, she said, with large companies like Coca-Cola working intensively on scope 3, and smaller companies not.

An important part of demonstrating carbon footprint is ensuring that you have good data, warned Olga. *“If you think you have good data at your company, go to an academic or statistician! Companies often don’t have as good data as they think. Bad data exposes you to risks and penalties. At scale, small things matter.”*

As well as gathering data, there will be other challenges for retailers on sustainability. In particular, the lack of recycled materials on the market is likely to be a problem because *“it’s so difficult to embed any recycled content when you just don’t have it.”*

Recycling is also *“a difficult landscape,”* said Olga,

because of the *“different markets, waste streams, and consumer interaction.”*

Importantly, *“consumers don’t understand the role that plastic fulfils.” “They love glass and paper,”* Olga said, *“but not plastic.”* Even when research shows us, for example, that *“fresh products last 50% longer if they are wrapped.”*

According to Olga, *“We don’t talk enough about food waste that can be avoided by wrapping something. Both food waste and packaging waste are important, but we need to find the right balance.”*

But there is hope!

Education does work to change people’s minds. It just needs to come from neutral, non industry sources. *“What consumers want is for national media and NGOs to tell them, because they don’t believe communications from industry due to their vested interests.”*



*“We don’t talk enough about food waste that can be avoided by wrapping something. Both food waste and packaging waste are important, but we need to find the right balance.”*

Olga Munroe



## PART 1.4. WHAT DOES THE FUTURE HOLD FOR PACKAGING?

### Panel discussion and conclusions

The packaging sector is growing, with a forecasted annual growth rate of 1.7% until 2027. New regulations are also driving rapid change and innovation.

Close to 120 people from 18 countries joined the event Shaping the Future with Packaging on 9 and 10 March 2023 to discuss why innovation is needed, and how companies along the supply chain are playing their part.

One central takeaway was clear: focusing on sustainability is no longer optional, it's mandatory. All speakers remarked that the packaging supply chain has a key role to play in the green transition.

In the panel discussion, Olga Munroe commented that *“industry is prepared and aware of these [environmental] topics,”* but *“consumer education is [also] very important.”* Improvements in industry and consumer education needs to happen at the same time to move forward in the most effective way.

Researchers can help companies take the necessary steps. Tom Hallam explained how Smithers is preparing to demonstrate what does and doesn't comply with new packaging regulations to help support companies.

Likewise, Peter Ragaert noted the importance of encouraging young people to study topics like food technology and sciences. This will help to ensure

that industry is provided with the best research for years to come.

On a related note, moderator Jo Stephenson highlighted the need to work on the image of the sector because *“until we get a grip of recruitment and finding talent, we will have a problem.”*

In conclusion, *“We need packaging!”* said Sante Conselvan, President of FTA Europe. *“Packaging is here to stay,”* echoed Jesper Jungersen, Vice President of Intergraf.

The packaging industry is an important stakeholder in Europe's evolution to a green and circular economy. Packaging producers and regulators will need to work together to ensure a smooth transition.

There will be challenges due to the complexity of different markets, different waste streams, different recycling capacities, and different cultural norms, but packaging producers are knowledgeable and prepared.

The industry is ready to meet this moment.



*“We see regulations [like the proposed EU Packaging and Packaging Waste Regulation] as being the number one driver of packaging development going forward – mainly because companies must do it.”*

Tom Hallam

A close-up photograph of a person's hands interacting with a document on a clipboard. One hand is pointing at a specific area on the document, while the other hand holds a white pen. The document contains various charts and graphs, including a bar chart at the bottom with labels for months like July, April, May, and June. The background is a wooden desk.

**PART 2.**  
EUROPEAN PRINTED  
PACKAGING TRENDS





## PART 2.1. INTRODUCTION

Smithers, formerly known as Smithers PIRA, is the worldwide authority on packaging, paper, and print industry supply chains. Established in 1925, the company provides strategic and technical consulting, testing, market reports and events that helps its clients gain market insights, identify

opportunities, evaluate product performance, and manage compliance. Smithers has worked on numerous projects focused on print for packaging and other printing markets, and has a wealth of market data, technical expertise and strategic insight to draw upon for this project.

## METHODOLOGY

Smithers undertakes ongoing research into European and global print markets and maintains a database of print market information covering printed output by print product, printing process and industry sector, as well as data on the key supply markets of new printing equipment, inks/colourants, paper/other substrates and prepress consumables. Given that there is no single official source that surveys print output in all its forms from all types of companies engaged in printing activities, ultimately, almost all available data on print is indicative.

The Smithers data used in this report covers both Western and Eastern Europe, including all EU-27

Member States as well as the United Kingdom, Norway and Switzerland. Russia and Ukraine are excluded from this analysis due to so much uncertainty in these markets at present. Whenever possible we have provided a global context to the European data.

For the purposes of this publication, value data has been converted into Euros. In some cases, data is presented in terms of constant 2022 prices and exchange rates to reflect real changes in demand after the effects of inflation (as measured by the consumer prices index) and exchange rate movements. Volume data is generally presented in terms of tonnes unless otherwise stated.

## PART 2.2. AN OVERVIEW OF THE EUROPEAN PRINTED PACKAGING MARKET

The printed packaging market continues to evolve, driven by several macro level factors. Concern for the environment has reached an all-time high which has resulted in sustainability being the primary driver of change for key stakeholders in the supply chain. Consumer influence on print and packaging development is now significant, the 'unboxing experience' and 'personalisation' being two great examples of this in the e-commerce sector. Significant advancements in technology across print processes, smart packaging and communication tools are being seen.

Europe remains a key region for print products globally. Despite this we expect only moderate growth in the overall value of print in Europe to 2027.

Packaging is expected to grow alongside more high-value printed products.

Printed packaging is segmented as follows:

- Corrugated boxes
- Cartons/sleeves
- Flexible packaging (plastic, paper & aluminium foil)
- Rigid plastics
- Metal containers.

Globally speaking, packaging is growth sector. This growth is being driven by demographic changes and changes in consumer lifestyles. Populations are

increasing in almost all countries around the world and there has been a notable shift in the proportion of people now living in urban vs rural areas. Consumers in the southern hemisphere have seen their disposable incomes increase which has driven demand for more packaged consumer products. Those of working age are now often referred to as ‘cash rich and time poor’ which is driving demand for packaging in areas such as convenience foods.

There are six key drivers we see having the greatest influence on the printed packaging market going forward:

1. Digital Printing
2. Sustainability & Regulation
3. The growth of E-commerce
4. Automation and Digitalisation
5. Consumer Attitudes
6. Packaging format innovation

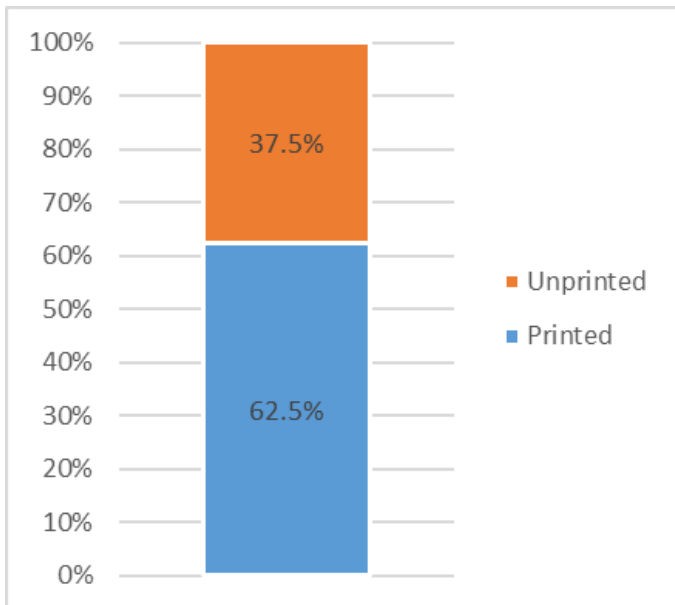
These drivers will be studied in more detail later in this report.

## PART 2.3. THE MARKET FOR PRINTED AND UNPRINTED PACKAGING IN EUROPE

### INTRODUCTION

Printed packaging accounts for some 63% of all European packaging but significant differences exist between the packaging segments:

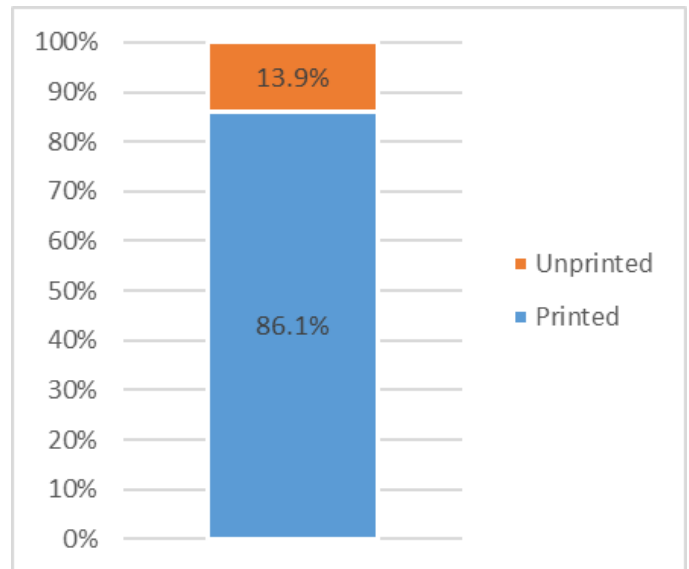
FIGURE 0.1 Europe: Printed vs Unprinted Consumer Flexible Packaging output, 2022e (% share by value)



Source: Smithers

Notes: Estimates considered for all countries in Europe

FIGURE 0.2 Europe: Printed vs Unprinted Corrugated Packaging output, 2022e (% share by value)

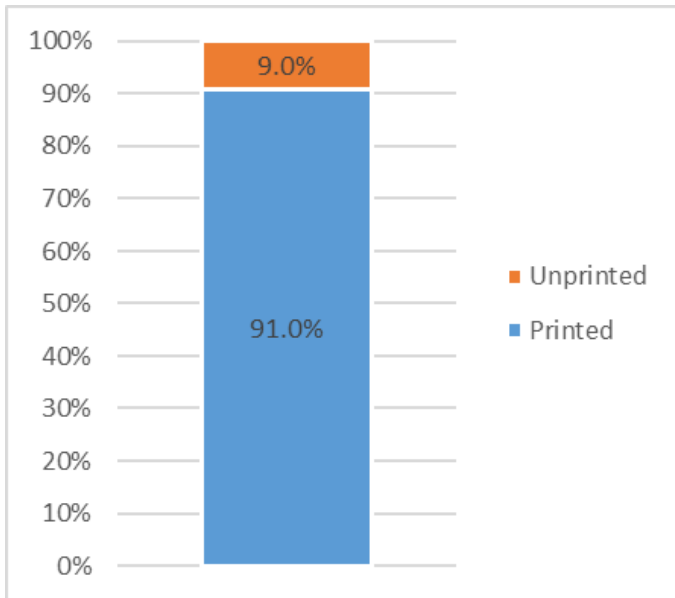


Source: Smithers

Notes: Estimates considered for all countries in Europe



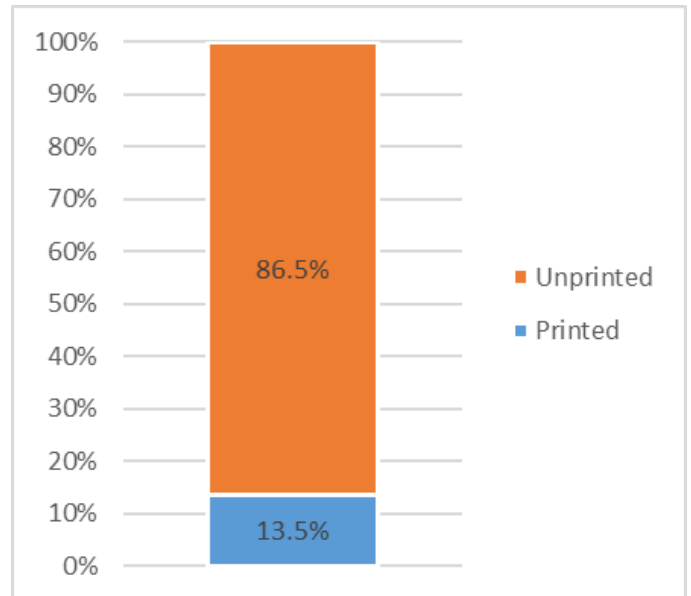
FIGURE 0.3 Europe: Printed vs Unprinted Carton output, 2022e (% share by value)



Source: Smithers

Notes: Estimates considered for all countries in Europe

FIGURE 0.4 Europe: Printed vs Unprinted Industrial/Other Flexible Packaging output, 2022e (% share by value)

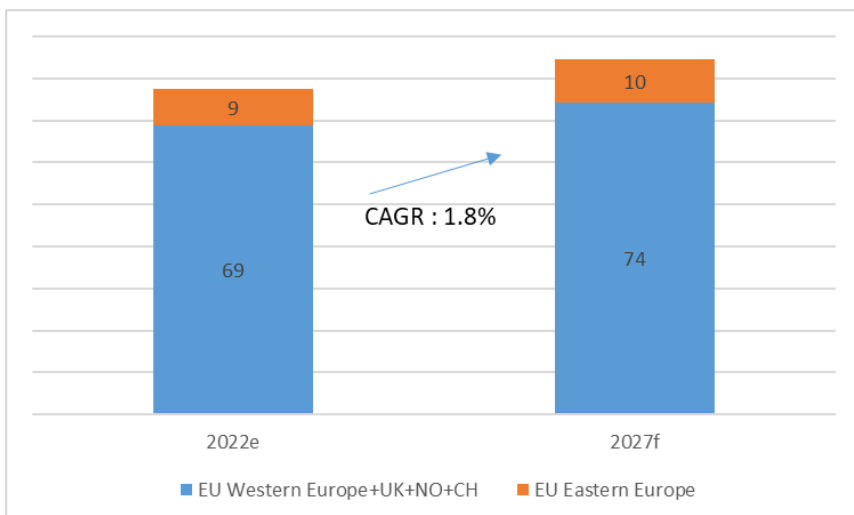


Source: Smithers

Notes: Estimates considered for all countries in Europe

All printing methods are used within the packaging industry, but regional variations do exist. In value terms, Western Europe has the largest proportion of printed packaging in Europe 89% (excluding labels), with Eastern Europe small by comparison, accounting for around 11% of the market. Looking at the five-year forecast through to 2027, Eastern Europe is expected to grow at a higher CAGR than Western Europe, i.e. 3.8% vs 1.5%. To put this in context the global printed packaging market is forecast to grow at a rate of 3.2% CAGR. Within the global market the EU27 + UK, NO and CH currently account for 20% of the global printed packaging market but this is expected to decline slightly to 19% by 2027.

FIGURE 0.5 European printed packaging market 2022e, 2027f, by Region (€ billion, constant 2021 prices & exchange rates)



Source: Smithers

Note: Countries considered include the EU27+UK, Norway, and Switzerland. Data includes flexible (plastic film, paper and aluminium foil substrates), corrugated, carton and other packaging (rigid plastic packaging and metal packaging) excludes labels

In 2022 the top five countries in Europe accounted for 68% of all printed packaging (i.e. corrugated, flexibles, cartons and other packaging), the equivalent of ~€52.4 billion in value terms. Germany ranked first followed by France and then the UK. The market share held by each country is forecast to remain unchanged in 2027.

FIGURE 0.6 Global printed packaging market 2022e

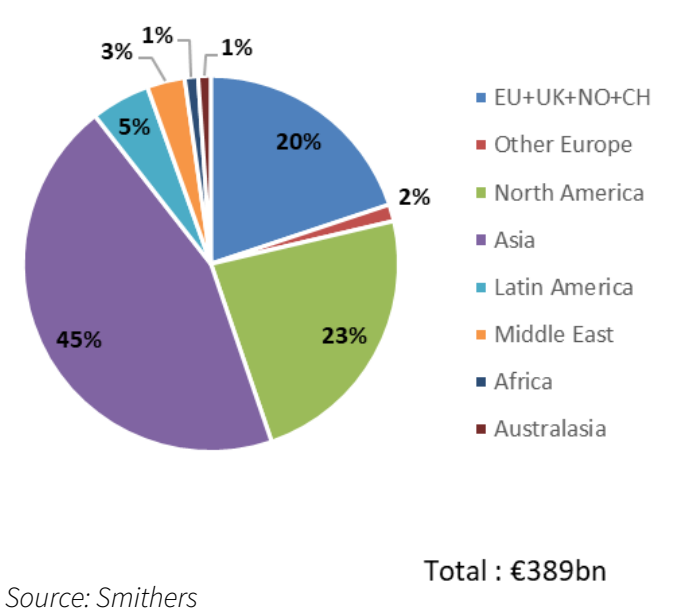
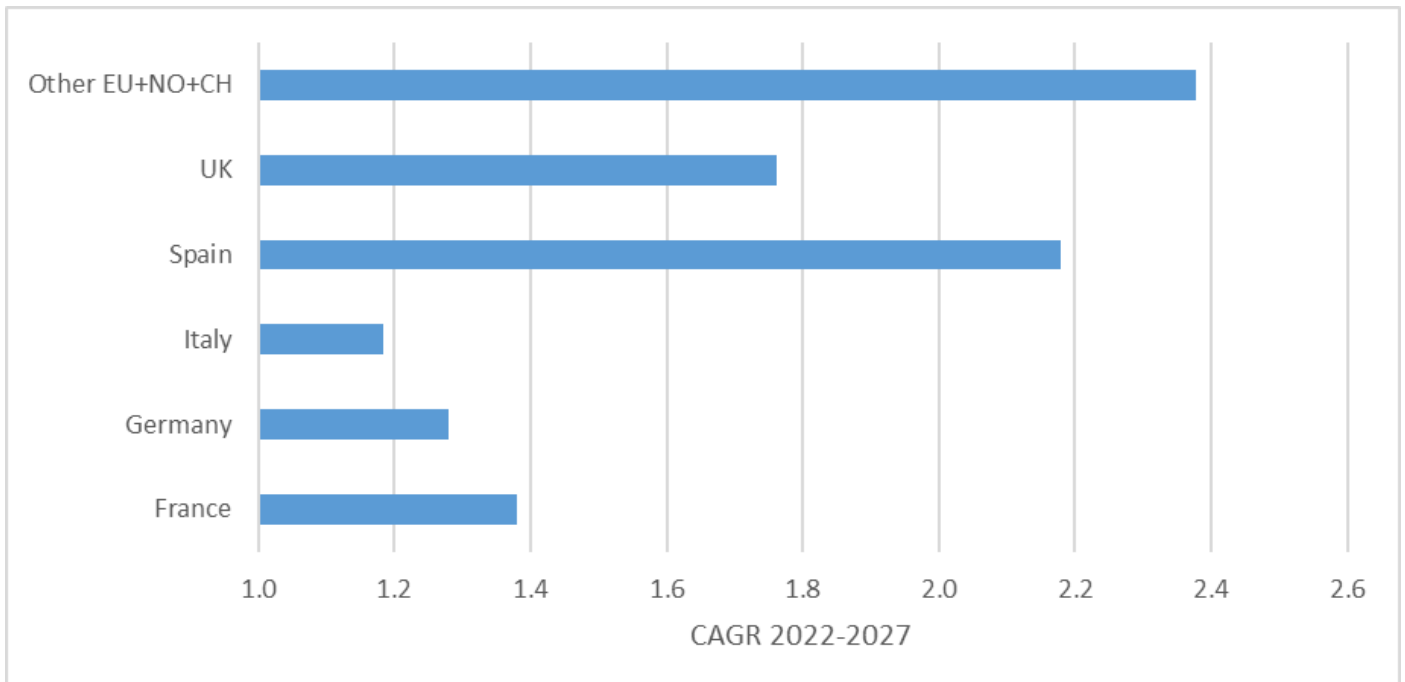


FIGURE 0.7 Five-year growth rates in the European printed packaging from 2022 to 2027 (CAGR %) – Top 5 Countries

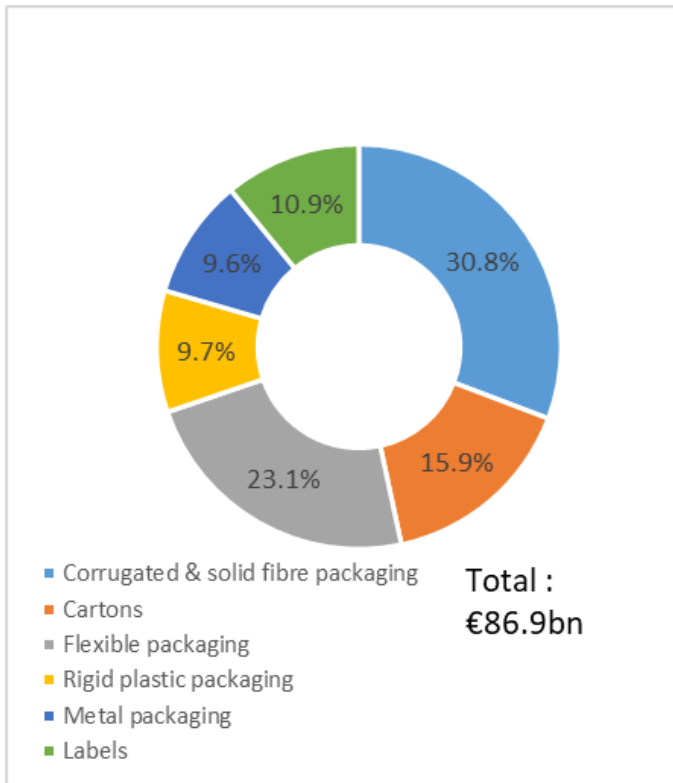


Note: Data includes flexible (plastic film, paper, and aluminium foil substrates), corrugated, carton and other packaging (rigid plastic packaging and metal packaging) and excludes labels



Printed packaging (excluding labels) is expected to reach €84.6 billion in 2027, growing at a CAGR of 1.8% between 2022-2027. During the same period, label printing output in Europe is forecast to increase at a CAGR of 1.1% reaching €10.03 billion in 2027, with Western Europe growing at a slower pace than Eastern Europe.

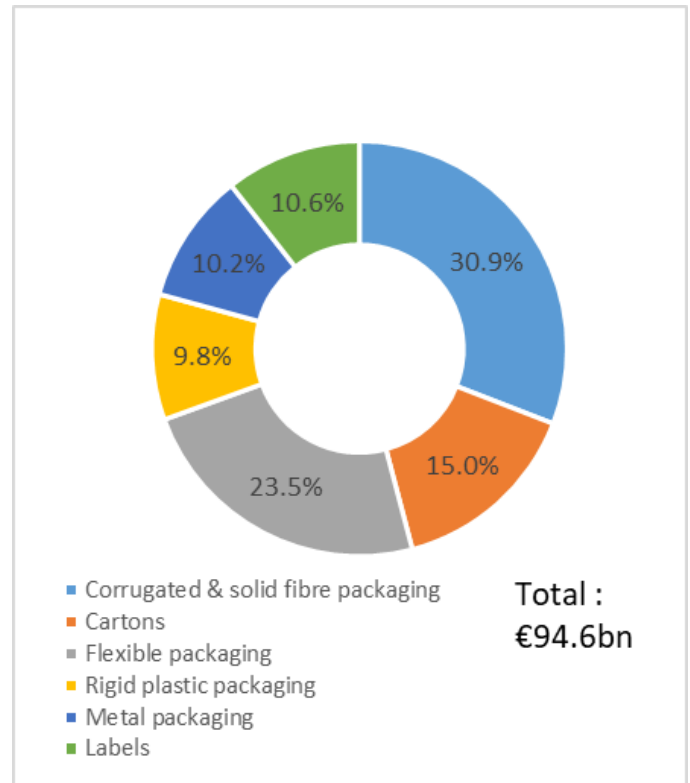
FIGURE 0.8 European Package & Label Printing Output by Type, 2022e, (% share by value, constant 2021 price and € exchange rate basis)



Source: Smithers

Note: Countries considered include the EU27 + UK, Norway, and Switzerland. Other packaging includes rigid plastic packaging and metal packaging; flexible packaging comprises plastic film, paper and aluminium foil substrates

FIGURE 0.9 European Package & Label Printing Output by Type, 2027f, (% share by value, constant 2021 price and € exchange rate basis)

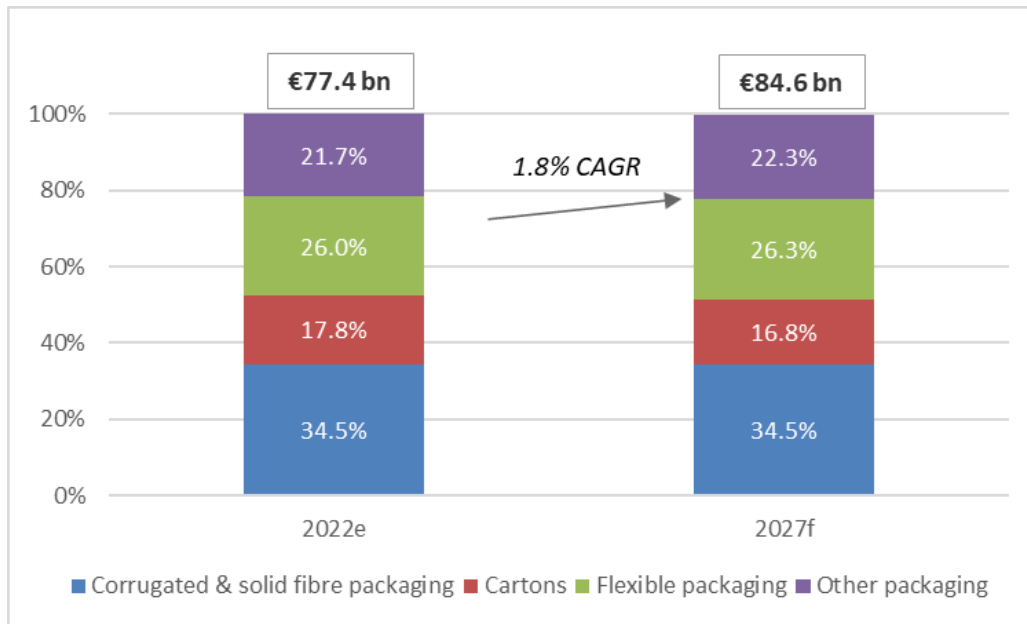


Source: Smithers

Note: Countries considered include the EU27 + UK, Norway, and Switzerland. Other packaging includes rigid plastic packaging and metal packaging; flexible packaging comprises plastic film, paper and aluminium foil substrates

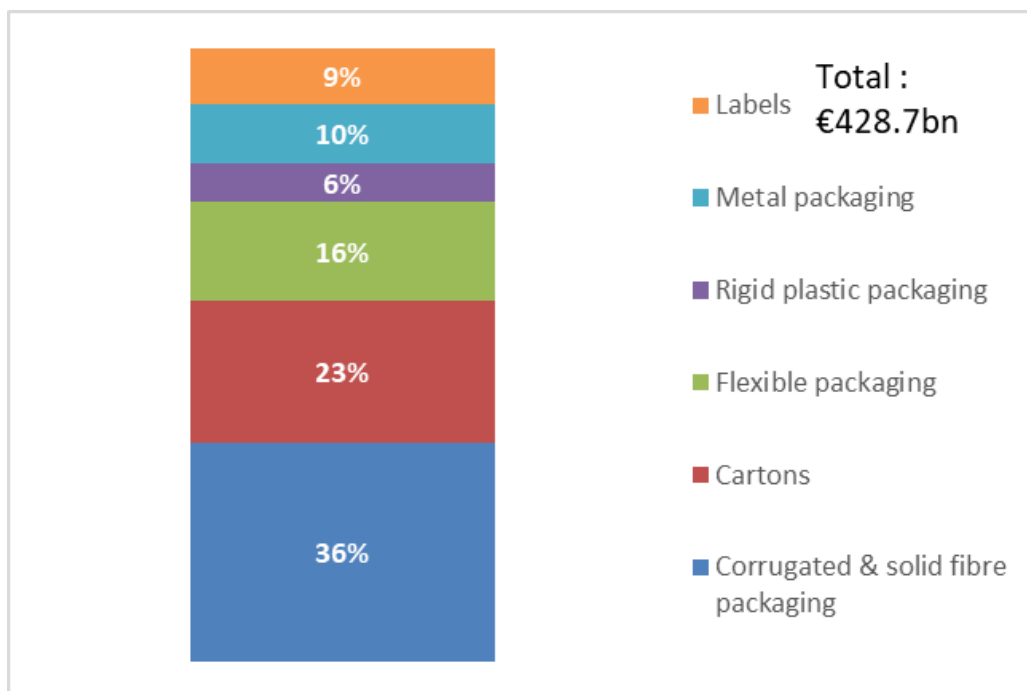
In 2022, printed corrugated and solid fibre packaging accounted the highest market share in total European printing output, both in terms of value and volume, and this segment is forecast to retain its top position in 2027. On a global scale corrugated and solid fibre packaging also accounts for the largest market share in value, with this trend continuing into 2027.

FIGURE 0.10 European package printing output by type, 2022e & 2027f, (% share by value, constant 2021 price & € exchange rate basis)



Source: Smithers

FIGURE 0.11 Global Package & Label Printing Output by Type 2022, (€ billion, constant 2021 prices & exchange rates)

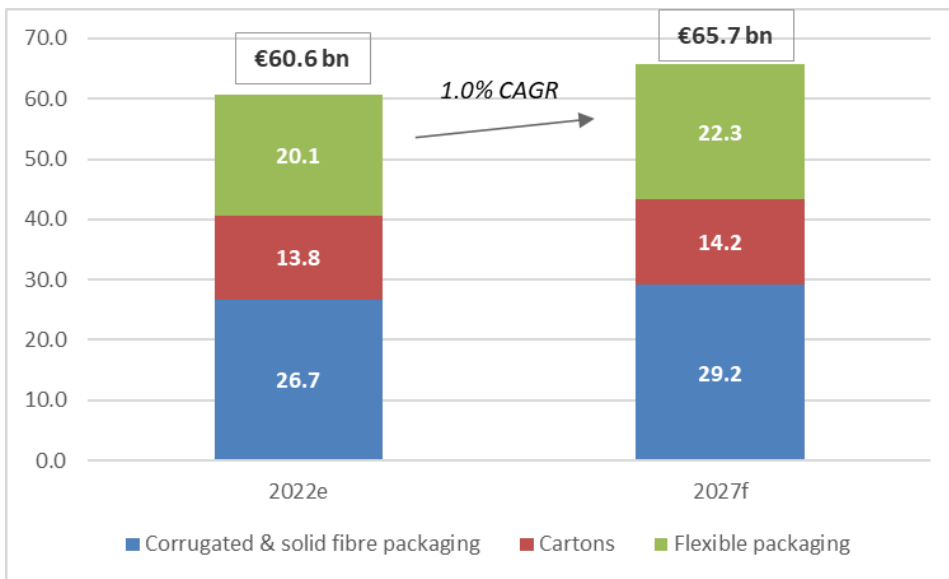


Source: Smithers

## PRINTED CORRUGATED, CARTONS AND FLEXIBLE PACKAGING MARKETS IN EUROPE

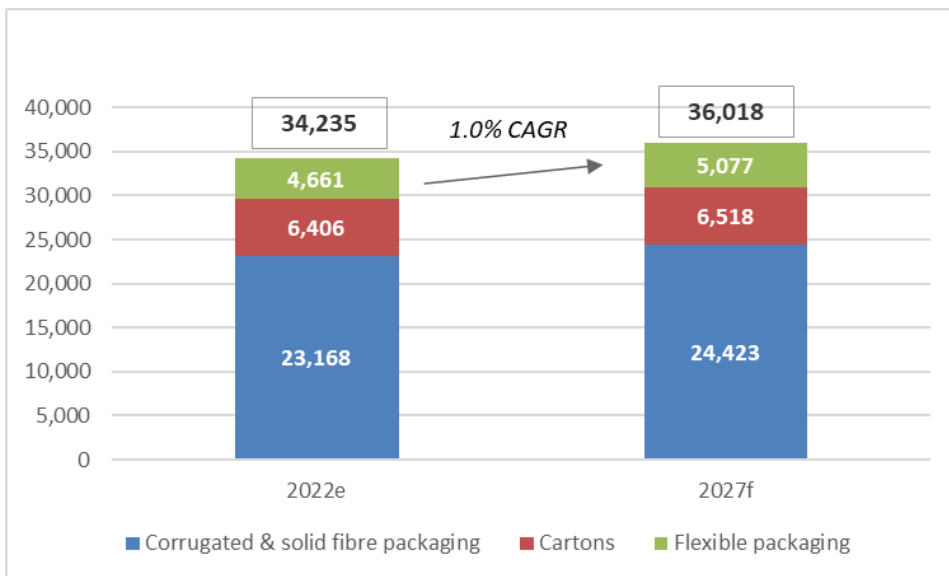
In Europe, printed flexible packaging is expected to experience the highest growth during the period from 2022 to 2027, with an estimated CAGR of 2.1%. However, a similar trend is forecast for corrugated and cartons, which will grow at a CAGR of 1.8% and 0.6%, respectively.

FIGURE 0.12 European package printing output by key sector, 2022e & 2027f, (€ billion, constant 2021 prices & exchange rates)



Source: Smithers

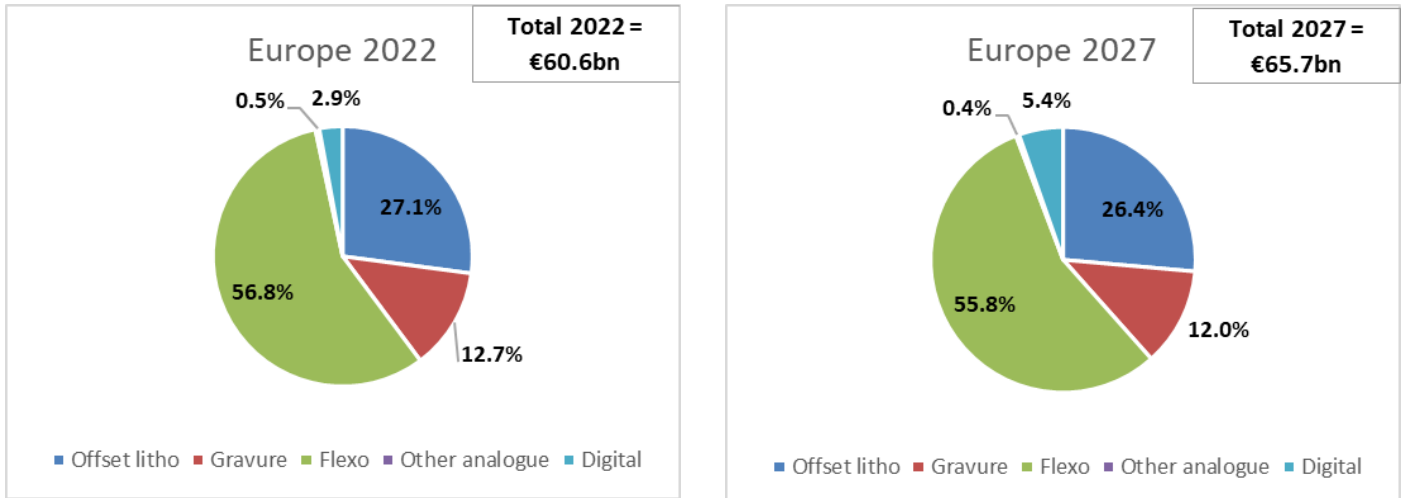
FIGURE 0.13 European package printing output by key sector, 2022e & 2027f, ('000 tonnes)



Source: Smithers



FIGURE 0.14 European printed packaging output by process across key pack types, 2022e, 2027f, (% share by value, constant 2021 price & € exchange rate basis)

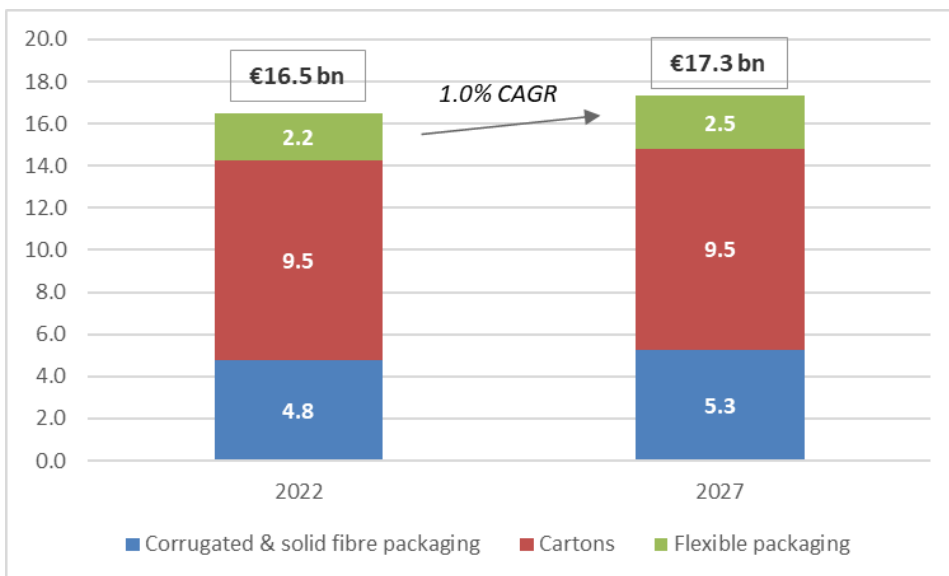


Source: Smithers

Globally, flexographic printing for packaging represents a lower overall share (40.5%) relative to Europe (56.8%) but it remained the largest share of the printed packaging market in 2022 and is expected to maintain a similar proportion in 2027. More granular data and analysis like this can be found in Smithers’ [The Future of Package Printing to 2027](#) Market Report.

European Printed digital packaging is expected to reach €3.5 billion by 2027, from €1.7 billion in 2022, growing at a high CAGR of 15.1%. In terms of volume, during the same period, digital printing in packaging is forecast to grow at an all-time high rate of 17.7%.

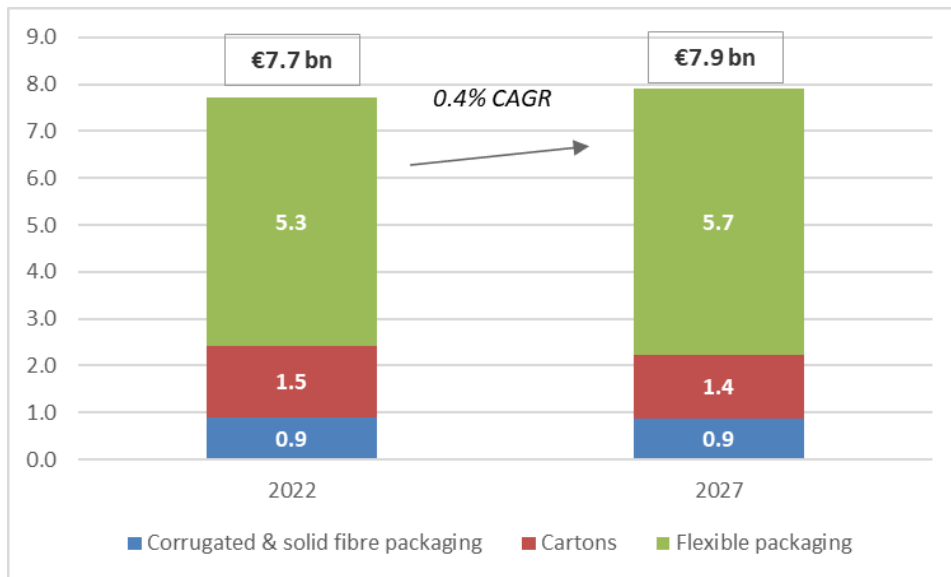
FIGURE 0.15 European offset lithographic package printing output by key pack type, 2022e & 2027f, (€ billion, constant 2021 prices & exchange rates)



Source: Smithers

In Europe lithographic printing is expected to see moderate growth in the years to 2027 (at 1% CAGR) which is lower than the global forecast (at 2.7% CAGR). Cartons are the main packaging type for which lithographic printing is used and this is a consistent trend across the world.

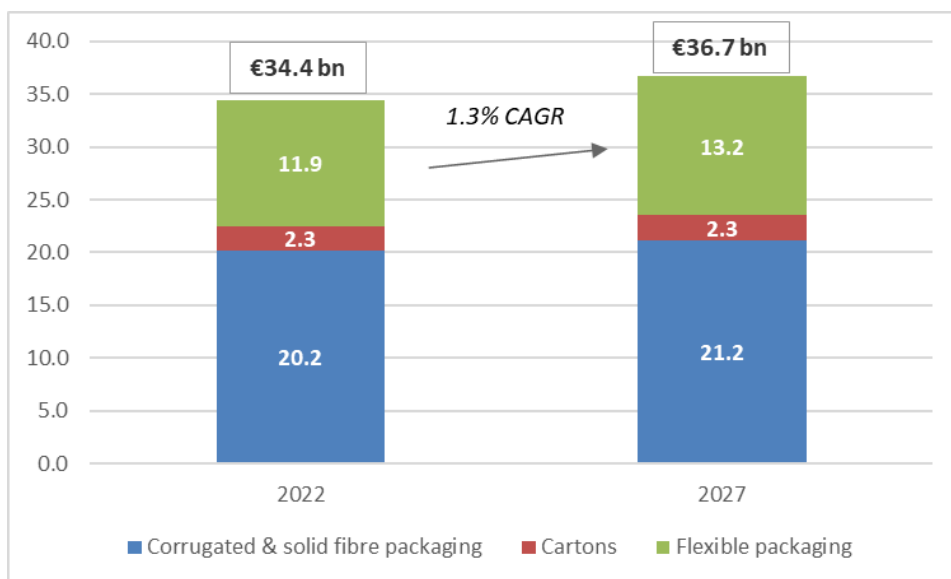
FIGURE 0.16 European gravure package printing output by key pack type, 2022e & 2027f, (€ billion, constant 2021 prices & exchange rates)



Source: Smithers

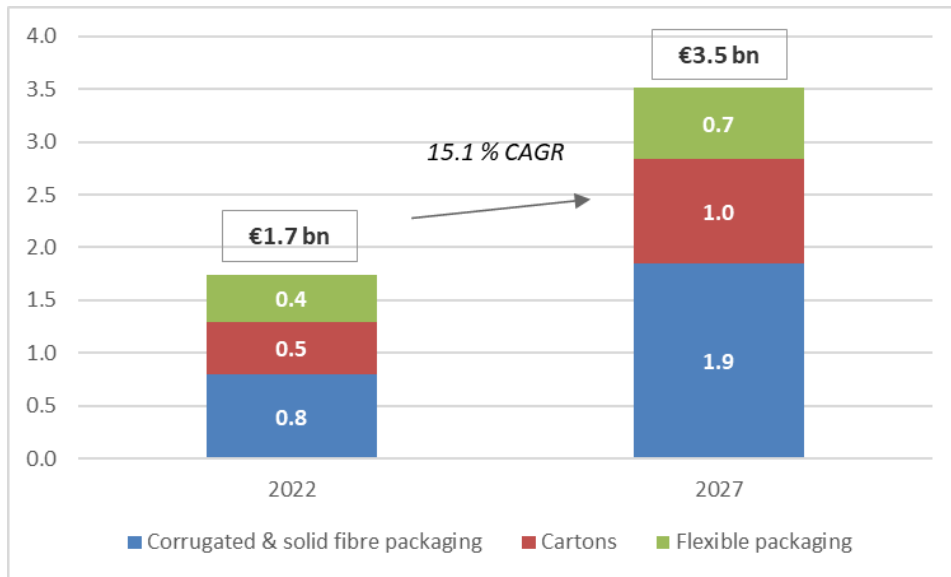
Rotogravure printing for packaging is relatively small compared with the other print methods but it still represented a global market value of almost ~€50bn in 2022.

FIGURE 0.17 European flexographic package printing output by key pack type, 2022e & 2027f, (€ billion, constant 2021 prices & exchange rates)



Source: Smithers

FIGURE 0.18 European digital package printing output by key pack type, 2022e & 2027f, (€ billion, constant 2021 prices & exchange rates)



Source: Smithers

## PART 2.4. EUROPEAN PRINTED PACKAGING KEY TRENDS AND DRIVERS

The key trends & drivers in the printed packaging industry identified by Smithers are:

1. Digital Printing
2. Sustainability and Regulation
3. The growth of E-commerce
4. Automation and Digitalisation
5. Consumer Attitudes
6. Packaging format innovation

### DIGITAL PRINTING

While there is a perception of print having a tough time, it is a highly competitive and dynamic business, particularly in the packaging sector. There huge excitement surrounding the development of digital printing – both inkjet and electrophotography. The early adopters of digital are getting to grips with the workflow and logistics implications of handling many more short runs. Packaging converters are working to implement major improvements in upstream order processing, design and prepress; and downstream finishing and logistics.



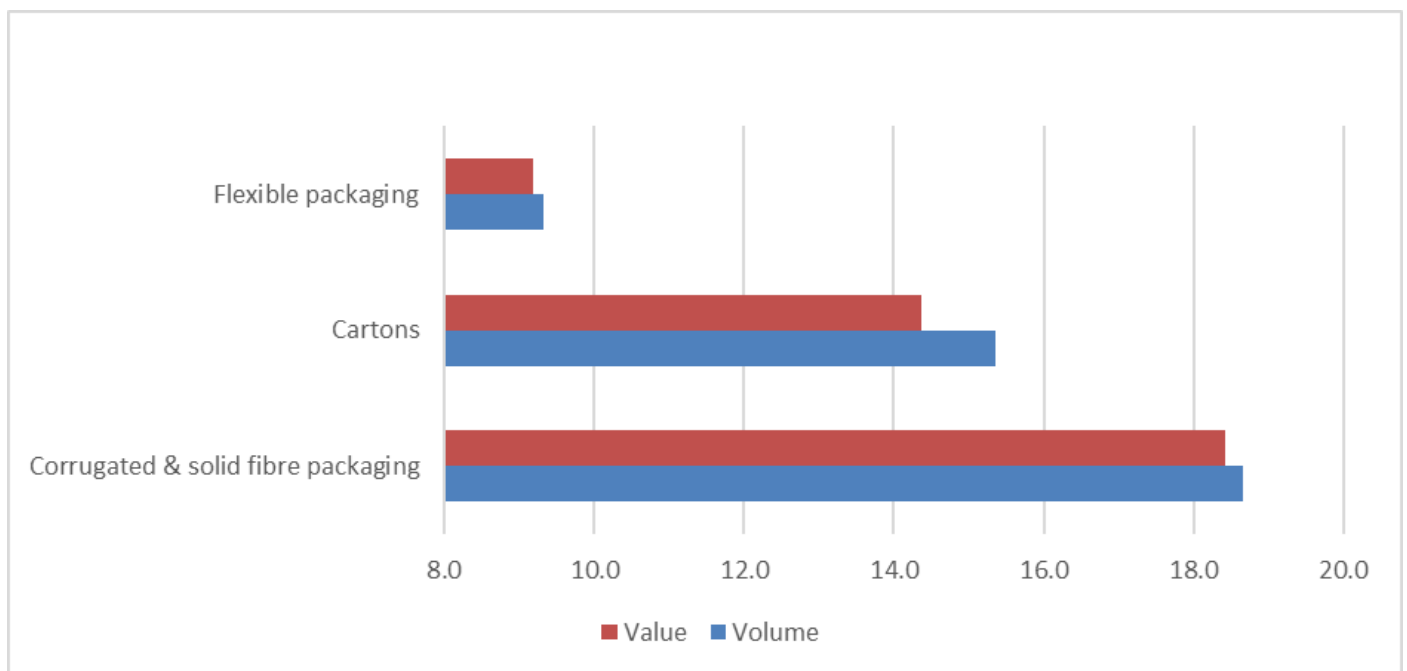
Digital printing is an increasingly used method used to print labels, corrugated, cartons, flexibles, rigid plastic, metal, and glass packaging. In 2020, as the global pandemic disrupted all aspects of human life, digital packaging volumes increased sharply, as providers were able to respond rapidly to fluctuating demands. Consumer packaging held up well, with growth in home-consumed essentials, while wholesale, luxury goods, clothing, industrial and some healthcare sectors saw sharp drops.

The market recovered well in the latter part of 2020, and there were disruptions to many packaging and label supply chains, with sharp price increases for many substrates contributing to the recovery in value. Several equipment vendors have seen orders for new presses fall as converters take stock of the new market conditions; but existing press utilisations have reportedly increased significantly, with the capabilities of digital production meeting the needs of large and small customers who are themselves coming to terms with their customer demands.

Digital is taking share from the analogue print methods of lithographic, flexographic, gravure and relief printing, as well as allowing new opportunities – importantly for the emerging craft and artisan sector. The technology developments have allowed converters, and manufacturers, to install equipment that delivers cost-effectively and at high productivity and quality. Digital print enables greater agility, helping converters meet ever more demanding schedules from their customers. The ability to print variable content allows brands to do new things, providing higher levels of engagement and new customer experiences that boost brand performance.

Analogue printing is reacting to this challenge with developments of its own aimed at improving the short run performance of offset litho, flexo and gravure include fixed gamut printing, automatic colour correction and registration, streamlined plate and cylinder preparation, robotic plate mounting and many others.

FIGURE 0.1 Growth in European digital package printing output by key pack type, 2022-2027



Source: Smithers

## Market drivers for adoption of digital print for packaging

A big factor is the trend towards shorter run lengths, which is one of the factors that is driving the growth in digital printing. When producing shorter runs, set-up cost differences can contribute significantly to variations in the cost per print between printing processes. On the other hand, over long runs these set-up costs are diluted and the consumables costs – ink, coatings, and other consumables – tend to dominate.

### *Fallout from COVID-19*

Digital labels & packaging generally fared well, helping meet fast-changing demand patterns as COVID hit. Agility and speed to market from digital boosted volumes, with changing order patterns reducing inventory and cost for many buyers. While the pandemic is history, the legacy of increased digitisation remains, with more online ordering and speed to market. Some micro companies set up in lockdown will be significant players – both buyers and suppliers of digital packaging in 2026.

### *Lack of knowledge of the technology*

There is still limited understanding of real digital benefits among buyers, designers and packaging converters. As we transition forward there will be a better understanding across the supply chain, opening up more demand, with designers taking advantage of the digital benefits. Cost advantages for short runs. Digital printing eliminates prepress and make-ready costs, specifically applicable for shorter runs in the case of marketing campaigns that offer products with personalised packaging.

### *Cost*

The initial cost of machinery, service and ink/toner are seen as a problem by many converters, while eliminating plate and prepress costs and set up waste is not always recognised. As we progress towards 2027, and economies of scale kick in, the premium cost of digital versus analogue will reduce. With integrated manufacturing as part of a connected supply chain, the time for packaging supply reduces.

### *The 'Amazon' effect*

The demand, and expectation, of next-day and same-day delivery is widespread but not typically in the labels and packaging sectors. In 2027 it is expected that specific print and finish on-demand services

will be offered by many converters. This technology will not only be utilised by artisan/niche brands, but also large-scale operators who will be able to shift their order patterns to smaller and more frequent jobs, with changes to meet consumer demands. Environmental benefits will be derived from reduced set-up waste, printing exact quantities on demand and elimination of minimum order quantities.

## Supply chain changes

Most packaging is produced by converters and shipped to manufacturers or packer/fillers and then into distribution chains. Some high-profile brands are taking pack production back in-house, using digital print to deliver greater agility and flexibility while controlling cost. Digital technology allows printing closer to the consumer and there are examples of digital print in manufacturers for on-demand production and distribution centres where printing customised packaging can then be cut to size on-demand.

Packaging is a direct cost for brands retailers and distribution companies, by adding promotional messaging and advertising this can change packaging from a cost into a revenue generator.

## Market barriers for adoption of digital print for packaging

### *Capability*

Digital print successfully replicates most analogue print, except for some spot colours, special-effect inks and coatings. Hybrid systems (and HP Indigo) can handle the special requirements. In the future more digital speciality inks will become available, with alternative methods such as Actega Ecoleaf used to replace metallic inks and foiling for example.

### *Cost*

Much digital is significantly higher cost than analogue; new high-performance machines are changing this with lower TCO. Price premium for inks falls with bulk supply direct from the equipment manufacturer, significantly reducing ink cost, particularly for water-based inkjet. Further economies of scale drive down the cost of equipment and the necessary control systems and workflow software.

### *Internal blockers*

Big brands need to satisfy many stakeholders when

changing the method of producing packaging, with approval needed from marketing, design, procurement, supply chain, legal, sustainability, planning and finance functions. If the needs of one of these are not met, the change is not made. Less reluctance among smaller organisations and craft brands.

More high-profile success stories reduce the barrier and encourage adoption. More experimentation among smaller sub-brands gain experience and reassurance, removing the concerns and letting the big companies adopt digital.

Some buyers and specifiers are not aware of the current capabilities of digital print in terms of quality, productivity, and cost. As the technology develops, these have changed radically, removing many of the technical and cost issues holding back digital. The understanding of brand managers, together with their agencies and designers, is changing slowly as more examples of increased market share and brand growth through the adoption of digital print are publicised.

### Digital print for packaging in markets

Digital label and packaging print is carried out across the world, although led by Europe and North America. Some Asian markets have been slower to adopt digital print methods, but the size of the sector means even with this lower penetration there are significant markets, with many local equipment providers competing with the multinational suppliers in India and China particularly.

## SUSTAINABILITY AND REGULATION

Sustainability is currently the #1 concern for consumers and governments and the packaging industry is a high-profile target for lobbying groups. From a print perspective, digital print eliminates analogue prepress and waste, and potential supply chain redundancy. By 2027, scientific rigorous lifecycle analysis measuring the key impacts will be available to determine the real performance of digital. If there are benefits, digital packaging will be boosted significantly.

Sustainability is also one of the key drivers in the packaging industry. All packaging stakeholders: raw materials suppliers, converters, distributors, brand

owners, retailers, and consumers, have started to focus increasingly on aligning their packaging and products with the circular economy.

### Circular packaging

The main objective of the circular economy principle is to keep valuable resources in use, or through as many lifecycles as possible. It entails gradually decoupling economic activity from the consumption of finite (fossil) resources and designing waste out of the system. Initiatives such as EU Vision 2020 encourage this new model by extending the product lifetime through the creation of more durable products, reduction of manufacturing waste, encouraging consumers to recycle, encouraging re-use, and by developing a stronger end market for waste. The transition to a circular economy does not only consist of adjustments aimed at reducing the negative impacts of the linear economy. Rather, it represents a fundamental shift that builds long-term resilience, generates business and economic opportunities, and provides both environmental and societal benefits.

Under the Circular Economy Action Plan, EU countries must ensure that the packaging placed in the market meets the essential requirements contained in Annex II of the Packaging and Packaging Waste Directive:

- To limit the weight and volume of packaging to a minimum in order to meet the required level of safety, hygiene and acceptability for consumers;
- To reduce the content of hazardous substances and materials in the packaging material and its components;
- To design reusable or recoverable packaging

### Carbon footprint

Reducing the emissions associated with the production and print of packaging is at the forefront of the leading players in the industry as they strive to reach net zero targets. This is however a challenging task, and the market is currently suffering from a deluge of greenwash – claims made against products that are factually untrue or not validated.

The main method of measuring a label or packaging solution's carbon footprint is to carry out a full lifecycle analysis (LCA). This is a valuable tool when the methodology is robust, and the findings are third-party verified, but the results should never be taken at face value. Supplier selection can be as important a



decision as what material since the carbon footprint of each factory can vary widely. Suppliers should be aware that carrying out an LCA can often be a slow and expensive process.

Sustainability is at the forefront of the European Commission's regulatory framework relating to packaging and labels. The strength of this piece of legislation is ever tightening and stakeholders in this space must be diligent to the requirements now in place.

The EU has prepared a comprehensive strategy to guide the end-of-life fate for consumer packaging. Its structure aims at an integrated circular economic model that favours reuse, recycling, and reduction. It suggests some anti-plastic sense, but that element focuses on single-use plastic articles rather than the material itself. Climate-change mitigation provides a strong backdrop for the prioritisation of policies.

### Draft Packaging and Packaging Waste Regulation ('PPWR')

As the name suggests, the PPWR is a draft Regulation which has been upgraded from its previous iteration known as the PPWD which was a Directive under EU legislation. The PPWR will be legally enforced across the EU by the end of 2024. The PPWR is the packaging industry's component of 'The European Green Deal' a portfolio of legal frameworks designed to deliver the objective of making the region carbon neutral by 2050.

The proposed requirements of the PPWR will place greater responsibility on those who place packaging on the market via [Extended Producer Responsibility](#) ('EPR'). Smithers have an off-the-shelf market report on just such a topic. See website for details.

These upgrades to the PPWR are expected to impact the foodservice and food and drink industry the most. The proposal for the PPWR will enter the regular EU scrutiny procedure, where further amendments will be made.

The current proposal is based on an impact assessment of the current PPWD that detected three main issues to address:

1. Growing packaging waste generation
2. Barriers to packaging recycling and re-use
3. Low recycling quality in plastic packaging and use of secondary raw materials

The overarching objectives of the proposal are

to 'reduce the negative environmental impact of packaging and packaging waste, while improving the functioning of the internal market'. This can be interpreted as:

4. Reduce the generation of packaging waste
5. Promote a circular economy
6. Promote the use of recycled content in packaging.

Why has the PPWR been proposed?

- Each year, the average EU citizen generates 180kg of packaging waste.
- 40% of plastic and 50% of paper consumed in EU is destined for packaging.
- Estimated that without EU intervention, packaging waste would increase a further 19% by 2030 (plastic packaging would increase 46%).

The targets:

- All packaging to be recyclable by 2030
- Reduce packaging waste by 15% by 2040 (per member state per capita vs 2018)
- By 2029, countries must create a deposit return scheme ('DRS') with a 90% collection rate target
- By 2025, 65% (by weight) of all packaging waste should be recycled
- Climate neutrality in packaging sector by 2050.

### Other EU Legislation influencing the Label & Packaging Markets

#### *Circular Economy Action Plan*

A 2015 outline of the EU's efforts to develop a sustainable, low-carbon, resource-efficient and competitive economy. It positions packaging waste in the continuum of production through consumption to waste management and on to recover or reusable resources. It presents a basic legislative outline not only with regulation of the private sector, but also including government investment and measurement of progress towards goals.

#### *Compliance Criteria on Environmental Claims*

Requires that waste be managed without endangering human health and harming the environment, without risk to water, air, soil, plants, or animals, without causing a nuisance through noise or odour, and without adversely affecting the countryside or places of special interest.

### *European Strategy for Plastics in a Circular Economy*

A strategy on plastics as part of the EU's transition towards a more circular economy. It seeks to improve "the way plastics are currently produced, used and discarded" because the status quo fails to capture the economic benefits of a more circular approach and harms the environment. The strategy calls for all plastic packaging on the EU market to be either reusable or recyclable in a cost effective manner by 2030.

### *The Single Use Plastics ('SUP') Directive*

February 2021, the European Parliament called on the commission to consider taking further action, such as amending the Single-Use Plastics Directive to ensure that single use plastics are replaced with reusable products where possible. The Commission was also urged to develop standards for reusable packaging and substitutes for single-use packaging.

The SUP Directive mandates recycled content targets for certain plastic packaging forms (beverage bottles), while member state plastic taxes linked to the Directive reward recycled content in some single-use plastics

### *Labelling Requirements*

There is growing legislation on labels and packaging, with more information required and in some sectors coding to reduce the potential of counterfeiting. Legislation also extends way beyond pharma into more consumer goods.

Track-and-trace using unique codes and a simple phone-based camera app to authenticate are being offered as an authentication method, and as a logistics tool for distribution. Many high value products can be authenticated although for high-volume, low-value items there are worries among some brands about potential litigation for false products.

## THE GROWTH OF E-COMMERCE

### Market Trends

The unprecedented growth in e-commerce activity since 2020 has resulted in a proportionately large increase in demand for transit packaging. This has been combined with external pressure from consumers, NGOs, and government regulations for retailers to reduce the environmental impact of

their e-commerce packaging. Efforts have focused on: lightweighting; reducing raw material usage; increasing recycled content; and eliminating void space. E-retailers are also looking at material substitution (plastic to paper) and reusable packaging.

The global market for e-commerce packaging in 2022 was estimated to be worth \$63.60 billion, having increased by an annual average of 20.0% since 2017. However, a 12.5% global value growth in 2022 was significantly slower than the rates experienced globally during the height of the Covid-19 pandemic and the surge in online shopping.

Further growth is envisaged for the global e-commerce packaging market as e-commerce activity continues to grow, but at a slower rate, with value sales projected to increase at around 9.8% CAGR to 2027.

### Key factors shaping the e-com packaging market

1. Environmental concerns surrounding plastic, from both raw material and end of life perspectives, will negatively impact polybags; in the EU retailers will need to use bags with minimum 30% recycled content to comply with regulations
2. Growth in paper mailing bags will offset some of the slowing growth in polybags
3. Improved 3D item scanning technology and fan-fold corrugated automated box making machinery will improve box-making efficiency and reduce void space
4. Demand for protective mailers should remain steady in larger formats but smaller formats are not expected to keep pace with the growth in other packaging types due to concerns over recyclability and the decline in some core product applications

### *Consumers expect high quality printed (and sometimes personalised) packaging*

High levels of consumer expectation now extend to packaging and they can feel disappointed by e-retailers without a well planned and executed packaging strategy. Packaging is often the brand's first physical contact with the consumer and judgement is often cast at this stage. In a Shorr Packaging survey, 51% of respondents stated that printed or personalised packaging made them feel that the product inside was more valuable. In

conventional retail, consumers hold a product as part of the purchase decision process, whereas online consumers only experience a physical product after receipt.

Digital printing has benefits when it comes to personalisation as individual print designs can be made to match the profile of individual customers. This can be achieved when the brand owner/retailer has a well-developed customer database ('big data').

When it comes to flexo the improvements in board qualities, such as white top kraftliners, means that brands can implement what is being termed 'Packvertising' – i.e. printing their corrugated boxes with high quality images to promote the brand and enhance the unboxing experience.

## AUTOMATION AND DIGITALISATION

### Leveraging Blockchain for Track and Trace Packaging

One of the most significant influences on the global market for track and trace packaging is blockchain technology, the penetration of which is highly likely to increase going forward. Blockchain technology can be described as a distributed and immutable ledger capable of recording transactions, tracking assets, and providing greater transparency throughout the supply chain. With blockchain technology, data is stored in interlinked blocks, which are timestamped and considered incapable of being forged. When combined with other technologies such as near-field communication (NFC) or the IoT, blockchain technology enables consumers to access the entire history of a product, thereby providing significant benefits in areas such as anti-counterfeiting and record-keeping.

Blockchain technology is perceived by its advocates to offer significant advantages to companies and organisations seeking traceability, anti-counterfeiting and brand authentication solutions. Much of its appeal can be attributed to its ability to enhance record-keeping and therefore improve supply chain and inventory management. With more people now owning internet-enabled mobile devices such as smartphones, the ability of consumers to check the authenticity of goods or supply chain traceability in a quick and convenient manner via technologies such as QR codes has significantly increased. For consumer

goods such as food, blockchain technology is viewed as a useful tool in the fight against contamination and threats to consumer safety, while it also offers benefits as far as innovation and intellectual property (IP) is concerned, since it can provide a clearer indication of what information was produced, when and by whom.

### Smart Packaging Developments

There have been several recent examples of how smart packaging has been used to add value to product offers:

- Accenture recently collaborated with a European luxury brand to establish a virtual retail showcase, which consumers could enter by scanning or activating the product's smart packaging. Once inside the metaverse, consumers could interact with the digital equivalent of the product – the resulting information generated by these consumer interactions could then be captured and used to provide insights in areas such as sales and manufacturing
- Pharmaceutical smart packaging developments include new time-temperature technologies to boost security and prolong the shelf life of products such as vaccines. In May 2022, Essentra Packaging and Advanced Material Development (AMD) announced they were collaborating to develop a new range of next-generation solutions within this sector to enhance patient safety
- During 2021, authorities in both the US and China announced they were developing improved food traceability schemes to increase food safety via the adoption of smart packaging solutions
- Adoption of smart packaging incorporating track and trace capabilities can often serve to improve the competitiveness of companies operating within the logistics industry, providing them with information that can assist in reducing waste and costs, as well as improving productivity
- One leading Australian company within the smart packaging market is Laava, which specialises in product authentication technology. Its portfolio includes Smart Fingerprints, which utilises patented optical technology to apply unique and randomly generated images to labels and other packaging and is being promoted as an alternative to QR codes. The Smart Fingerprints technology has been used for over two million items and has been adopted for both food and beverage



applications in recent years.

### HolyGrail 2.0 – Digital Watermarking

Digital watermarking is another technology used for ID purposes within the packaging industry. These are small codes approximately the size of a postage stamp used in consumer packaging applications and offer brand owners benefits such as increased supply chain visibility and consumer engagement. The technology forms the basis of HolyGrail 2.0, an initiative within the EU undertaken by the European Brands Association and Alliance to End Plastic Waste.

It is hoped that digital watermarks can be used to sort packaging into its corresponding streams, thereby improving recycling rates. A trial to use digital watermarking for this purpose was started in France in February 2023.

## CONSUMER ATTITUDES

### Consumers do not like single-use plastic packaging

Consumers have a negative perception of single-use plastic packaging which has stimulated the development of alternative materials and packaging formats. A good example is in the grocery sector where brand owners and retail chains continue to trial replacements for single-use plastic packaging such as compostable punnets, paper bags and cellulose nets. It is expected that the recent trend of substituting single-use plastic packaging with more renewable materials will continue at pace.

### Consumers are driving the demand for recyclable, and compostable, packaging

Partially in response to media exposure of the harmful effects of plastics on the environment, consumers are becoming more aware and passionate about the impact packaging is having on the natural world. Consumer advocacy is pushing brand owners and national governments to act. To date, bans on single-use plastic products such as plastic straws, bags, coffee cups and other non-recyclable products have been imposed in some European markets. There is also more interest in reusable products and an effort to expand the availability of kerbside recycling and education on the need and options for sustainability.

### Consumers do not like Oversized Packaging

There is growing consumer concern about the use of excessive packaging for home deliveries which is forcing brand owners and retailers to react with improvements.

Consumers expect all the above to be considered for printed packaging. Sustainable printed packaging can go a long way in increasing the value of the unboxing experience for the customer.

## PACKAGING FORMAT INNOVATION

There are many worthy examples that could be included but the three most prominent developments over the last 2-3 years have been:

- Paper mailing bags for e-commerce
- Paper bottles for the beverage and homecare sectors
- Dry moulded pulp in the foodservice and pharma markets

### Paper Mailing Bags replacing Polybags

Paper mailing bags are a relatively new concept made possible by design innovations, converting machinery, paper quality and adhesives. They offer a functionality comparable to polybags, in terms of durability and capacity, when the right quality of paper is used. Paper mailers also offer great print opportunities for brand owners who wants to make use of the surface of the packaging to promote their brand and improve the unboxing experience.

The best performing paper mailing bags use high quality virgin kraft paper, which provides strength, puncture resistance and, in some cases, a good level of stretch. These properties provide a paper mailing bag with the durability to navigate the supply chain safely.

Similar to polybags, paper mailing bags are available with one or two peel and seal strips and they can be modified to incorporate a die-cut carry handle. They usually incorporate a tear strip for clean opening and to prevent damage to the second peel and seal strip.

### Paper Bottles

Many of the world's largest material suppliers and

brand owners have come together to help develop the paper bottle concept. There are two leading companies in this space:

1. Pulpex

The Pulpex bottle claims to be PET-free/HDPE-free and manufactured from sustainably sourced wood pulp from 100% renewable feedstocks and responsibly managed forests.

2. Paboco

Paboco's paper bottle claims to be recyclable with 85% paper and 15% HDPE resistant barrier, obtained from responsible paper sources.

## Dry Molded Pulp

Pulpac is the pioneer of this technology which is marketed as a direct substitute to plastic alternatives. Dry molding wood fibre/pulp aims to replicate the functional capability of wet molding but with lower environmental impact. This technology can be used in several end use applications including hot drinks cup lids, single use cutlery, thermoformed trays for food and portion.



**FIND OUT MORE**

Smithers have produced a number of cutting-edge market reports that focus on various sectors and topics, including sustainability, within the packaging industry. The reports provide exclusive content, including market forecasts, major drivers and trends, critical analysis of technological developments, and more.

Just some of our industry-leading reports include; **The Future of Single-Use Plastic Packaging in a Sustainable World**, **The Impact of Climate Regulations on Packaging to 2030**, and more.

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