Future-proof your multipacks:

A data-driven guide for CPG professionals

Are you a European CPG decision-maker navigating challenging beverage multipacking decisions? Cut through the noise with practical, must-know insights in this whitepaper.

PakTech®

What's inside?

Prioritising performance means **preserving positive brand perception**

Faced with tensions between public perception, packaging performance, sustainability goals, and cost considerations, it can be challenging for CPG brands to choose the best material for their packaging needs. The gap between perception and performance can even become a business problem, especially for packaging choices involving plastics, where public opinion moves faster than operational evidence.

The challenge facing European CPG decision-makers is not choosing between "good" and "bad" materials. Different materials work better for different jobs. The real challenge is finding the right material for the specific job while meeting regulations that are set to get stricter over the next decade.

For liquids and heavy products, multipacking solutions must meet regulatory requirements, minimise product loss, maintain retailer relationships, and protect brand reputation – throughout the entire distribution process. When a carrier fails during distribution, the cost of wasted product exceeds the environmental impact of the packaging itself. When it fails at retail, consumers blame the brand, not the packaging supplier.

Fibre-based solutions currently dominate industry conversation due to the material strengths across many applications. But sustainability outcomes depend on more than material type and perception bias. Some jobs create demands where what looks good and what performs well don't align. In contrast, while recycled high-density polyethylene (rHDPE) from post-consumer sources may lack fibre's advantages in public perceptions, it offers a multipackaging solution that performs well, complies with regulations, and is built for increasingly cost-conscious markets and consumers.

Read on to learn more and uncover insights for making confident, data-driven packaging decisions.

Packaging that **performs well**

Performance, durability and supply chain efficiency

Supply chain efficiency is critically dependent on structural integrity of secondary packaging. When packaging fails, the resulting product waste – damaged units and unsellable stock – is often costly and negatively impacts the environment.

As brands rush to transition away from conventional options like shrink wrap and virgin plastic rings to meet regulatory targets, fibre-based solutions have increasingly become the assumed default. However, sustainability outcomes are not determined by material type alone, and fibre does not inherently represent a lower environmental impact across the full product lifecycle.

While fibre is widely perceived as recyclable or biodegradable, paperboard solutions can carry significant upstream environmental burdens, including water consumption, energy-intensive processing, and transportation weight.

In practice, coatings, adhesives and contamination may also limit effective recyclability or result in downcycling, particularly in cold-chain environments.[1]

In the humid or wet conditions typical of European beverage supply chains and cold-storage retail environments, moisture-susceptible fibre-based carriers frequently lose structural integrity. This leads to higher damage rates and a significantly greater risk of product loss compared to moisture-resistant and more durable solutions.[2]

There is another pragmatic option that combines the durability of plastic with the circularity of fibre: **rHDPE**.

rHDPE is engineered to maintain performance under extreme conditions

Key performance indicators include:

- **High tensile strength:**
  Multiple studies demonstrate recycled HDPE maintains mechanical properties across recycling cycles and structural strength suitable for multipacking applications.[3]
- **Moisture and heat resistance:**
  Temperature cycling creates condensation that weakens fibre board. Since packages typically change temperature multiple times between production and retail, each cycle involves condensation that gets the carrier wet.[4] Unlike paper and fibre carriers that face structural challenges in beverage distribution, rHDPE maintains integrity through humid and temperature-variable conditions between production, cold-chain distribution, and retail refrigeration.[5,6]
- **Impact resistance:**
  rHDPE maintains impact resistance suitable for heavy liquid loads, which is critical for multipacking applications carrying substantial weight.[7,8]
- **Crush resistance:**
  Research demonstrates structural integrity under compression, ensuring products arrive at retail in saleable condition.[9,3]

Material failure equals brand erosion; rHDPE serves as risk management

A consumer experiencing a carrier failure or a retailer managing ‘soggy boxes’ will associate the logistical breakdown with the brand name, not the packaging vendor. Notably, damaged cardboard with intact products still led to returns and disposal due to ambiguous criteria for determining stain damage on site.[10]

rHDPE serves as a risk-management tool to help maintain lower failure rates. By maintaining structural integrity through distribution conditions that cause fibre to fail, such as condensation from temperature cycling, moisture exposure in refrigeration, and weight stress from liquid loads, rHDPE protects both product and brand reputation while offering significant benefits for compliance and cost-effectiveness.

Lifecycle data support rHDPE's environmental performance

Despite high recycling rates for fibre, evidence-based LCA data and insights also demonstrate that rHDPE has a lower carbon footprint than paperboard carriers and cartons.[11]

Carbon footprint:

0.022-0.034 kg CO_2-eq **two to five times lower than paperboard alternatives**[12]

Spanish recycling operations:

ALPLA's 2022 study found rHDPE achieves 0.24 kg CO_2-eq per kilogram, **representing 88% fewer GHG emissions than virgin HDPE** (1.92 kg CO_2-eq)[13]

rHDPE can be recycled up to 10 times without significant property loss

HDPE may not be biodegradable or compostable, but it can be recycled up to 10 times without a significant change to its long-term mechanical properties – or virtually indefinitely when blended with new materials during recycling.[14,15,16] This creates genuine circularity that supports long-term infrastructure investment. By contrast, fibre degrades in quality with every cycle.[17]

Demand for rHDPE multipacking justifies recycling infrastructure

Creating and sustaining demand for multipacking made with rHDPE – a material with demonstrated processing capability – also justifies and reinforces the need for collection and recycling infrastructure over the long term. At the same time, it helps avoid the environmental impact of microplastics from single-use biodegradable plastic options.

Minimalist design allows primary packaging to shine

When it comes to making on-shelf impact, minimalist rHDPE packaging allows the primary packaging to shine, achieving visual impact with minimal material use and without unnecessary material and added costs.

Strong packaging performance impacts environmental footprint

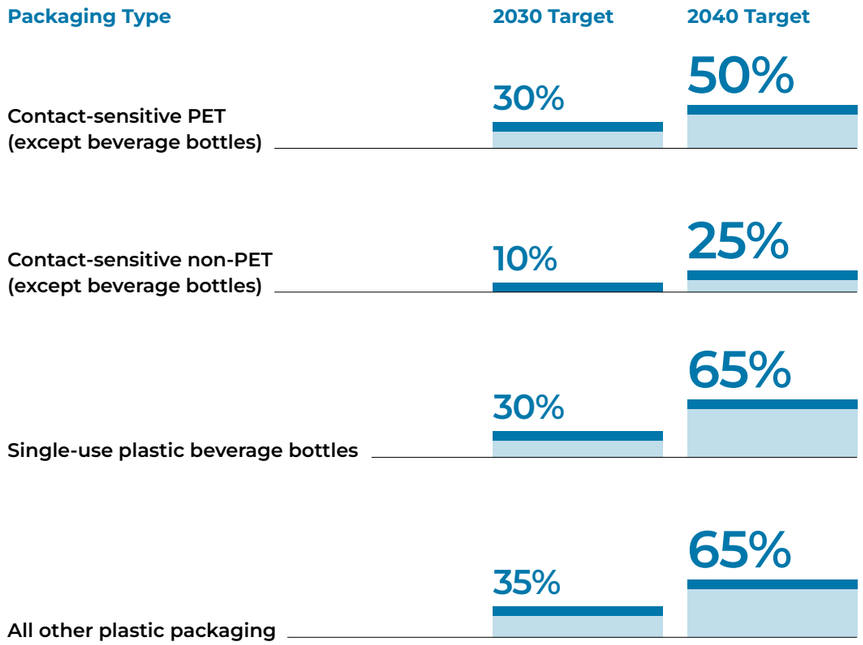
Ultimately, the performance advantage of rHDPE connects directly to sustainability outcomes: when packaging fails, the environmental cost of wasted product typically exceeds the packaging's own impact.[18] This makes durability a sustainability imperative, not just an operational preference. Beyond rHDPE's sustainability credentials, its ability to maintain structural integrity through moisture exposure, temperature cycling, and heavy loads directly prevents the product waste that dominates overall environmental impact.

Packaging that's compliant

Meeting recycled content mandates

Today, the European regulatory landscape is undergoing a tectonic shift as the EU Packaging and Packaging Waste Regulation (PPWR) comes into force, requiring brands to meet aggressive recycled content targets for 2025 and 2030.[19,20] Adopted on 16th December 2024, Regulation (EU) 2025/40 took effect on 11th February 2025 and applies generally from 12th August 2026.

PPWR mandatory recycled content for plastic packaging



Additional requirements:

All packaging designed for recycling (≥70% recyclable by weight) by 2030

Packaging "recycled at scale" with real infrastructure by 2035

Only packaging ≥80% recyclable permitted by 2038

But how exactly are these new requirements impacting the industry across Europe?

Concurrent to the EU-wide changes surrounding packaging and waste regulations, other countries in the economic bloc and the region are also making their own changes to the law that favour recycled content. This not only makes non-compliance both illegal and costly, but also positions rHDPE as the sensible choice for performance and compliance.

The cost of non-compliance

As EU countries gear up to meet the new PPWR requirements with local regulations, non-compliance becomes a risk that many brands can ill afford.

Germany	United Kingdom	Spain
Implements the Packaging Law Implementation Act (VerpackDG) with 75% recycling quotas for plastics.[21] Non-compliance penalties reach €200,000 plus sales bans. The LUCID packaging register already requires producer registration.	Plastic Packaging Tax (started April 2022) charging £223.69 per tonne (April 2025) on packaging with less than 30% recycled content. Applies to businesses making or importing 10+ tonnes annually. Revenue dropped 3% to £259 million in 2024–25, with taxable packaging falling from 42% to 38% – evidence of a shift toward recycled content.[22]	Operates a Plastic Packaging Tax (Law 7/2022, started January 2023) charging €0.45 per kilogram of non-recycled plastic. Collection targets rise from 70% (2023) to 77% (2025), 85% (2027) to 90% (2029).[21,23,24]

Case in point

Take a medium-sized EU beverage company operating in Germany, the UK, and Spain. If this company uses an average of 150 tonnes of virgin secondary plastic packaging annually, failing to meet recycled content requirements in each country could incur the following consequences:

Germany	United Kingdom	Spain
• Fixed penalty for non-compliance: **€200,000** • Additional risk: **Sales ban** (revenue impact potentially millions)	• 50 tonnes × £223.69/tonne = **£33,553.50** • Converting to EUR (approximate rate £1 = €1.19): **€39,929** (recurring tax)	• 150,000 kg × €0.45/kg = **€67,500** (recurring tax)
Total cost of non-compliance in the first year alone: €307,429 - along with revenue impact of sales ban in Germany		

It's worth noting that these figures don't include the impact of reputational damage costs, increased scrutiny and audit costs, and potential additional penalties for repeated violations if non-compliance continues.

rHDPE maximises recycled content

As recycled content mandates kick in, many brands are struggling to reach 15% or 30% recycled content due to supply chain constraints or technical limitations.[25,26] Yet PakTech has repurposed over 1.2 billion gallon-sized milk jugs, turning more than 167 million pounds of rHDPE into 100% recycled packaging handles since 2012. This demonstrates that rHPDE can indeed power fully recycled plastic packaging products that are also fully recyclable.[27]

Fully recycled post-consumer rHDPE multipacking solutions allow brands to not only meet but exceed European mandates today, mitigating the risk of future compliance penalties.

Packaging for **cost- and value-conscious markets**

The retail reality

European brands are balancing high sustainability expectations with the pricing reality of budget-conscious consumers and the rise of discounters like Lidl, Aldi and the expansion of bulk-buy retailers like Costco.[28,29,30,31]

Discount retailer expansion amplifies multipack demand

Lidl's UK grocery market share reached 8.1% in June 2025 and Aldi is planning 100 additional stores in London alone.[32] Lidl even targeted Aldi's market share in June 2025 with the "biggest price cut of all time" in Germany, permanently reducing prices for 500 products by up to 35% as the retailers vied for price leadership.[33]

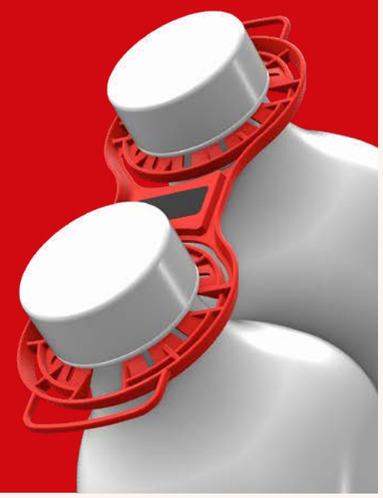
At discounters, private label occupies approximately 90% of shelf space, with own-label achieving 63% volume share and 55% value share across UK grocery.[34] In this value-driven, competitive environment that favours multipack formats that deliver perceived savings, durability is an economic necessity for brands, retailers, and cost-conscious consumers.

Functional superiority in beverage applications

rHDPE handles provide the minimalist, high-strength solution required to bundle products without the excess weight or shipping volume of traditional secondary packaging. They also win on price comparison. LDPE plastic rings average only $0.05 per unit, with HDPE carriers offering cost savings of up to 25% versus competitors.[35] Paper cartons require substantial initial investment in machinery and higher per-unit costs, while plant fibre carriers and applicators cost more than plastic solutions.

rHDPE handles provide the minimalist, high-strength solution

- **Material efficiency:** Minimalist design reduces weight-based taxes and logistics costs.
- **Automated scalability to adapt to changing business needs:** Automated applicators for rHDPE multipacking applicators can match line speeds from 60 to 1,500 units per minute, ensuring no production bottlenecks even at high volumes.[36]
- **Total cost reduction:** Lower damage rates and maximizing recycled content (meeting PPWR) reduce the financial risk of both product loss and regulatory fines.
- **Visual impact with minimal material:** Minimalist rHDPE packaging allows the primary packaging to shine, achieving on-shelf visual impact without unnecessary wrapping around product with more material and added costs.



Minimizing **total cost of ownership**

As a functionally superior packaging material, using rHDPE multipacking directly lowers Total Cost of Ownership (TCO).

Cost considerations across the lifecycle	
Layer 1	**Material cost** HDPE carriers offer cost savings of up to 25% versus competitors at the unit level, while paper cartons require higher initial machinery investment and greater per-unit costs.[35]
Layer 2	**Weight-based taxes and logistics** rHDPE's minimalist design means less material by weight. In markets with weight-based packaging taxes (UK: £223.69/tonne on packaging below 30% recycled content; Spain: €0.45/kg on non-recycled plastic), lighter packaging with 100% recycled content avoids these charges entirely
Layer 3	**Damage and product loss** When fibre carriers fail in cold-chain distribution, the cost isn't a replacement carrier - it's wasted product. rHDPE's moisture and temperature resistance reduces this exposure across every distribution cycle.
Layer 4	**Compliance penalties** With PPWR mandating 35% recycled content by 2030 and German penalties reaching €200,000 for non-compliance, the gap between fully recycled content (rHDPE) and the industry's struggle to reach 30% represents a measurable financial risk that compounds year on year.
Layer 5	**Line speed and scalability** Automated rHDPE applicators run at 60 to 1,500 units per minute, matching high-volume production demands without bottlenecks.[36] Using a slower-application format carries an operational cost that may not appear in material price comparisons but shows up in throughput.

The evidence suggests that the financial case extends beyond direct material costs alone. 70% of European brand owners also expect packaging costs to increase, as spending on sustainable packaging is expected to grow from 42% of packaging budgets today to over 60% by 2028.[37] In this environment, choosing the right packaging material that meets compliance objectives with strong functional performance standards is the smart, cost-effective choice.

The roundup

As mandatory PPWR and local country regulations for recycled content kick in across the EU, CPG brands must adapt quickly to ensure compliance and avoid costly reputational and financial penalties. For price-sensitive consumers today, sustainability is also an expectation rather than an aspiration – yet they won't compromise on product protection or cost either.

In this climate, CPG brands that want to stand out from the competition need reliable secondary packaging solutions that excel on each of these counts. This is where rHDPE shines. Fully recycled and fully recyclable, rHDPE serves as a high-performance multipacking solution that's cost-effective while exceeding – rather than simply meeting – recycled content mandates and supporting the circular economy. For brands and decision-makers, choosing rHDPE multipacking translates into true confidence when it comes to navigating the fast-changing industry landscape over the long-term. More critically, early movers in rHDPE multipacking solutions stand to gain a competitive advantage as others scramble to catch up.

Want to reap the performance, sustainability, and cost-effectiveness benefits of **rHDPE-powered multipacking?**

Get in touch with PakTech

About PakTech

PakTech is a designer and manufacturer of 100% recyclable injection moulded handles made from 100% recycled HDPE for the food, beverage, and consumer goods industries.

Founded in 1991, PakTech is a global industry leader in using fully recycled HDPE plastic to create fully recyclable packaging handles and automated application equipment.

Headquartered in Eugene, Oregon, PakTech is a full-service company that specialises in creating injection moulded handles for multi-packing products. PakTech makes it easy for consumers to grab, carry, and release multiple products using a simple, minimal, 100% recycled and recyclable handle.

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