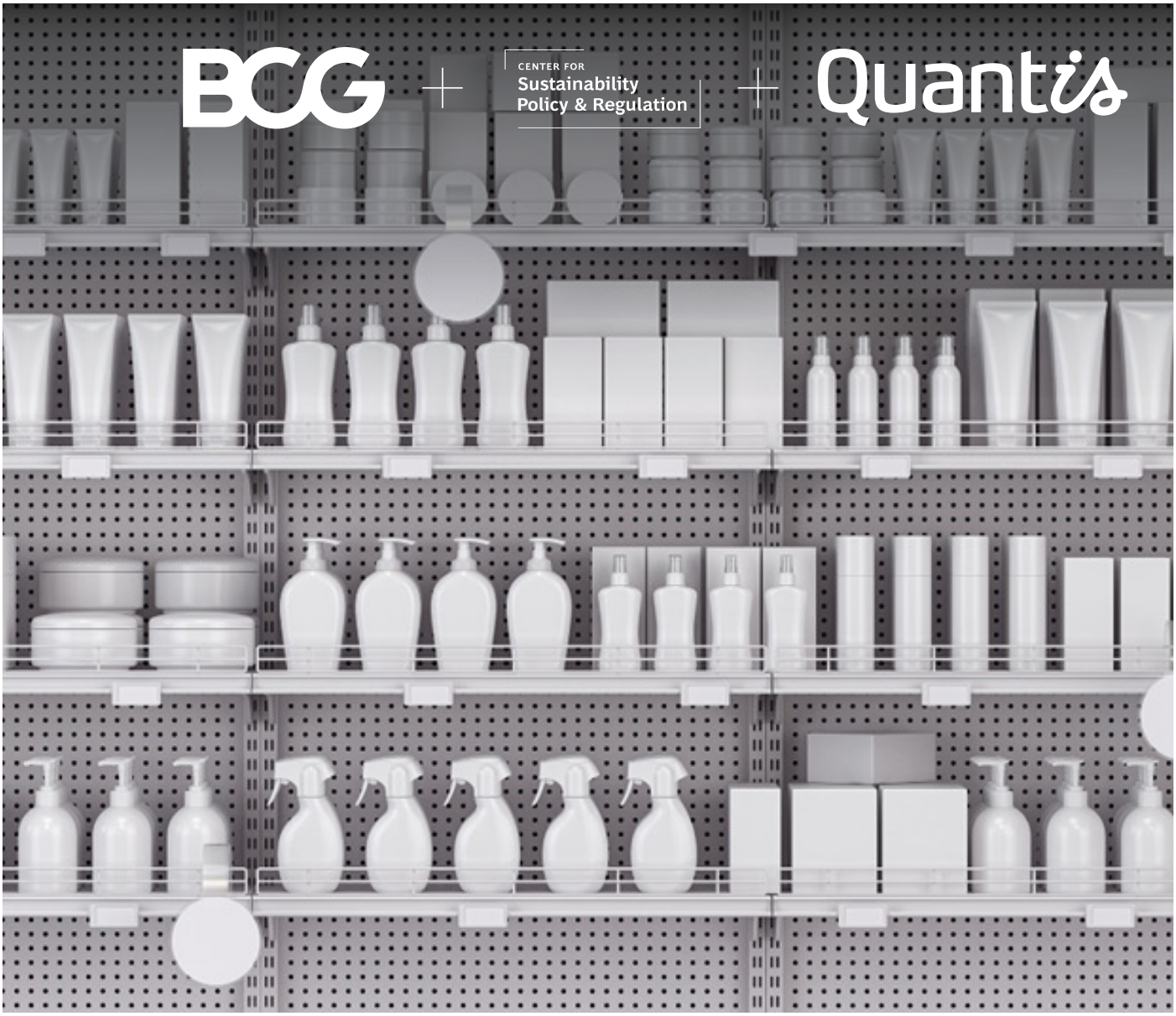


WHITE PAPER

Unpacking PPWR

What the EU's Packaging and Packaging Waste Regulation means for companies that produce, use or handle packaging

November 2024
By Alexander Meyer zum Felde, Patrick Herhold, Alejandro Navarro, Edmond Rhys Jones, Merle Stepke-Müller, Maren Mende-Benford, Miriam Benedi, and Laura Peano

Unpacking PPWR

Executive Summary

The Packaging and Packaging Waste Regulation (PPWR) is set to come into force with immediate effect, most likely in the fourth quarter of 2024. The regulation introduces sweeping changes aimed at reducing waste generation, promoting a circular economy, and increasing the uptake of recycled content in packaging across the European Union (EU). To achieve these goals, the PPWR outlines a series of mandatory targets and requirements, including stringent standards for recyclability, recycled content, and packaging minimization. Many of these will already be mandatory to meet by 2030.

The PPWR is a dynamic framework, with further developments anticipated over the next few years. Additional details and requirements, such as those related to design-for-recycling criteria and to fee modulation within the extended producer responsibility (EPR) system, will be clarified through delegated acts and reviews. Indeed, key updates are planned for as soon as 2026. This ongoing evolution will continue to shape the regulatory landscape, and businesses could benefit from staying informed and agile.

There is a clear sense of urgency too for any company that engages in business sales in Europe. Given the significant impact of the PPWR on business models and products, companies that produce, use, or handle packaging should act promptly. Experience from our client assignments suggests that 80% of current packaging solutions may need to be redesigned to meet these new requirements. The sheer scale of this overhaul will pose operational challenges, but will also generate opportunities. Companies can benefit from assessing their compliance gaps, prioritizing necessary adjustments, and exploring strategic changes to align with PPWR. In this way, they can ensure their competitiveness and compliance in this rapidly changing market.

EU PPWR will have a significant impact on all businesses involved with packaging

In April 2024, the **European Parliament approved the Packaging and Packaging Waste Regulation** (PPWR).[1] This regulation governs all packaging materials placed on the European Union (EU) market, and will therefore affect their production, use, re-use, recycling, disposal, and reduction. Unlike its predecessor (the Packaging and Packaging Waste Directive (PPWD), PPWR is **legally binding** and requires compliance from all companies and products within its scope. Moreover, with immediate effect upon the regulation entering into force, it applies to all sectors that produce or use packaging. This means the regulation is expected to have comprehensive effects, impacting companies of all sizes. The regulation is currently being reviewed, and is **expected to come into force** in its final version in **the fourth quarter of 2024**.

The purpose of this BCG white paper is to:

- Summarize the **objectives, targets and approach** of the regulation
- Share perspective on potential implications of PPWR for businesses that produce, use and handle packaging
- Share practical next steps that businesses could take

1. Regulation of the European Parliament and the Council on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC.

PPWR will fundamentally alter the packaging world, bringing about substantial changes in packaging design, processes, and recycling and waste management. As these changes typically require one to two years to implement, it is beneficial for companies to start addressing PPWR requirements promptly to meet targets as early as 2028 and ensure compliance.

Based on industry observations, many companies may need to adjust over 80% of their current product packaging to meet the new requirements, potentially leading to significant operational challenges and costs. However, if companies approach the required adjustments systematically, and embed relevant modifications at the start of the design process, they will be well placed to ensure full compliance at lower cost.

PPWR requirements affect all aspects of packaging

The PPWR has its **origins in the PPWD**, which was first published in 1994, with the last significant amendments made in 2018. In 2022, the European Commission drafted a proposal for regulation that would repeal the PPWD. This proposal was approved by the European Parliament in 2023 and consequently adopted by the Council of Europe. Following negotiations between the European Commission, the European Parliament, and the Council of the European Union, the final PPWR was **approved on 24th April 2024**. It now awaits formal approval by the Council of the European Union, and is expected to enter into force in Q4 2024.

The PPWR's **objectives** are threefold:

1. **To reduce** the generation of packaging **waste**

2. To promote a **circular economy** for packaging in a cost-efficient way

3. To foster the **uptake of recycled content** in packaging

By meeting these three objectives, the PPWR will support the **European Green Deal**, lower the **environmental footprint** of packaging, contribute to **climate neutrality**, and **harmonize** the packaging and packaging waste regulatory efforts of individual European member states.

The PPWR is a complex document. It spans 321 pages, and is divided into 71 (often cross-referencing) articles across 13 chapters. It is also supported by a further 12 annexes. To make this regulatory document more digestible, **BCG has grouped its contents into 10 core topic clusters (Exhibit 1).**

Exhibit 1 - Core topic cluster of the PPWR

Core PPWR topic cluster	Description
1 Waste reduction targets	Overall packaging waste reduction targets across all material types with particular emphasis on public sector
2 Recyclability requirements	Harmonized recyclability performance based on sorting capabilities, recycling methods, etc.
3 Recycled content targets	Obligatory targets to include a certain amount of PCR[1] material in packaging
4 Reuse/refill targets	Obligatory targets to design a certain percentage of packaging to be reused/refilled
5 Compostability targets	Longer-term compostability targets for tea and coffee bags and single serve units
6 Packaging minimization targets	Requirement to reduce packaging to the minimum necessary for its functionality
7 Single-use plastic bans (SUP bans) & substance bans	Restrictions on certain packaging formats, including single-use plastic packaging, and certain substances
8 Labelling requirements	Requirements to label packaging with instructions for reuse, refill, & recycling
9 Extended producer responsibility (EPR)	Introduction of a system in which producers pay a fee based on recyclability and recycled content
10 Deposit return scheme (DRS)	Deposit and return systems for single-use plastic and metal beverage bottles and containers

Sources: European Union Legislation; expert interviews; BCG analysis (non-exhaustive).

[1]Post consumer recycled material.

PPWR sets complex targets, including for recyclability and recycled input

Aside from certain exemptions discussed below, all materials, uses, and product types that can be packaged, are – or will be – affected by PPWR in some form.

The **materials impacted** are:

- **Plastic** (PET rigid, PE rigid, PP rigid, HDPE and PP rigid, other rigid plastics, flexible films, PS, XPS, EPS, and biodegradable rigid and flexible)
- **Paper and cardboard** (except liquid packaging board)
- **Metal** (aluminum/steel)
- **Wood** (wood/cork)
- Others (textiles, ceramics and porcelain)

Uses can be divided into primary (or sales) packaging, **secondary** (or grouped) packaging, and **tertiary** (or transport) packaging.

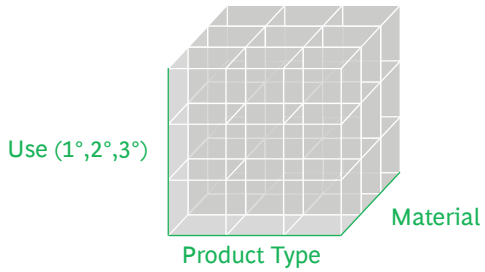
Finally, **product types** that can be packaged are:

- **Food**
  - Contact sensitive
  - Non-contact sensitive
- **Non-food**
  - Contact sensitive
  - Non-contact sensitive

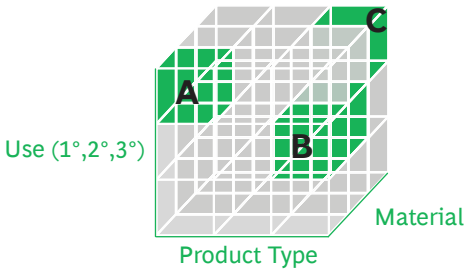
Companies which use, produce or handle packaging are **affected by different aspects of these three dimensions (material, use and product type),** depending on which **combination of dimensions their business model covers (Exhibit 2).**

Example **requirements** under PPWR, along the ten core topic clusters, are **summarized in Exhibit 3.** However, there are **further nuances** and additional requirements depending on the combination of material (including sub-material/polymer), use, and product type. The graphic should therefore only be viewed as an illustration of select examples, and a starting point for assessing the detailed requirements under the PPWR.

Exhibit 2 - PPWR has an impact along three dimensions



PPWR can have impact along three dimensions of the impact cube. Each combination of dimensions comes with its own, unique PPWR requirements.



For example, companies with the following combinations of dimensions are expected to encounter different PPWR requirements.

- Retailer of beverages in primary packaging made of plastic/PET (A)
- Manufacturer of primary and secondary packaging for chocolate bars made of plastic and aluminum foil (B)
- Logistics company which transports food or non-food goods on tertiary, wooden pallets (C)

Source: BCG analysis, 2024.

Exhibit 3 - Highlights of PPWR requirements

Core PPWR topic cluster	~ 2030[1]	~ 2040[1] *Non-exhaustive*	Beyond the examples listed here, several high-level, non material specific requirements exist. Also, for several topic clusters, a long list of targets needs to be considered when assessing a specific combination of material, product type, use and timeline:
1 Waste reduction targets	5% reduction per capita in packaging waste	15% reduction per capita in packaging waste	
2 Recyclability requirements	Only A, B, C3 grade packaging allowed in the market[2]	Only A or B grade packaging in the market[2]	~130 targets
3 Recycled content targets	Single-use plastic beverage bottles: 30% recycled content	Other plastic packaging components: 65%	~80 targets
4 Reuse/refill targets	10% of non-alcoholic and alcoholic beverages (excl. wine) must be in reusable packaging	At least 70% of transport packaging must be reusable	~50 targets
5 Compostability targets	E.g. tea and coffee bags, single-serve coffee systems, sticky labels on fruits & vegetables must be compostable		~10 targets
6 Packaging minimization targets	Empty space shall be minimized, maximum 50% allowed in secondary, tertiary and e-commerce packaging		
7 Single-use plastic bans (SUP bans) & substance bans	Specific single-use plastic items banned, incl. e.g. packaging for unprocessed fresh fruits and vegetables		~100 targets
8 Labelling requirements	Material composition to facilitate sorting must be easily understandable		
9 Extended producer responsibility (EPR)	Annual reporting on arrangements to ensure extended producer responsibility		
10 Deposit return scheme (DRS)	90% separate collection for single use plastic & metal beverage containers (up to 3 liters)[3]		

Sources: EU Packaging and Packaging Waste Regulation, 2024; BCG analysis.

[1]Exact timing varies.

[2]Grade A: 95% recycling efficiency. Grade B: 80% recycling efficiency. Grade C: 70% recycling efficiency.

[3]Except if country already at 80% separate collection by 2026.

Despite this extensive list of targets, there are **more than 15 further reviews, assessments, and delegated acts scheduled for the coming years.** These will continue to shape the PPWR, and include the development of a delegated act, due in 2026, to set a minimum number of reuses for packaging. In 2028, further acts are anticipated on design-for-recycling criteria and recycling performance grades, and the establishment of a framework for extended producer responsibility fee modulation (in which different fee structures will be applied according to recyclability or the recycled content achieved) will also be due. Finally, in 2031, a review of the empty space ratio and related exemptions, including for sales packaging, is expected. These ongoing developments are poised to significantly influence how companies adapt to compliance requirements.[2]

2. For a more detailed overview of the outstanding aspects of the PPWR, please contact the BCG authors of this white paper.

It is also important to note that there are approximately **30 explicit exemptions within the PPWR.** These include the exemption from recyclability requirements for contact-sensitive packaging of medical devices, infant formula and baby food; the exemption from recycled content targets for foods for special medical purposes, dangerous goods, and plastic parts representing less than 5% of the total weight of the whole packaging unit; and the exemption for micro-enterprises from reuse and refill targets.[3]

Finally, there are several **aspects which have not yet been explicitly clarified** by the PPWR. It remains uncertain, for example, what exactly constitutes non-compliance (whether there are thresholds, for example, or whether missing a single target is enough to constitute non-compliance). Similarly, it is unclear how compliance needs to be reported, or what the associated technical documentation entails, or what the consequences of non-compliance involve (such as fines and sales bans).

On a more technical level, the PPWR does not state if targets and thresholds refer to packaging units or individual components, whether targets can be averaged (such as across markets or across products), how recycling performance grades are calculated (and how composites affect the grade), and how multi-layered products should be treated in relation to the PPWR.

The PPWR can therefore be viewed as a dynamic and evolving regulation, and companies are encouraged to closely monitor new developments and additions. Taking a cautious approach to requirements and striving for full compliance at all times could help companies navigate the regulatory landscape effectively.

Impact varies across industries, products and business models

Companies throughout the value chain of those that produce, use and handle packaging are affected to different degrees by the PPWR. The scale of the impact first depends on the relevant combination of material, use and product type that is being packaged. It also depends on the company's business model.

The below heat map (Exhibit 4) demonstrates which PPWR topic clusters are likely to have the greatest impact on which type of business. The overall impact is expected to be particularly significant for retailers with private label products, FMCG companies and brands, recycling and waste management businesses, and packaging manufacturers. Conversely, pharmaceutical and medical businesses will experience either no impact or negligible impact in the short term, since packaging for medical products is exempt from the PPWR. (Nevertheless, non-contact sensitive, secondary or tertiary packaging for pharmaceutical and medical goods are covered under the PPWR).

3. For a detailed overview of exemptions, please refer to the EU Packaging and Packaging Waste Regulation or contact the BCG authors of this white paper.

Exhibit 4 - Heat map of impact on different types of business

Sources: Expert input; BCG analysis, 2024.

[1]The higher the estimated impact on a certain type of impact, the more actions are likely needed to ensure compliance.

We are supporting many of our clients to understand their exposure to PPWR, their readiness to make themselves compliant, and their immediate next steps.

Our assessments have typically found that the majority of product portfolios are at medium to high risk of failing to comply with the PPWR. The financial implications of failing to comply depends largely on the Commission's approach to enforcement. We have estimated that a combination of extended producer fees, plastics and plastic packaging tax, penalties and sales bans could represent between 30% of European sales to total sales bans on the European market. Companies can avoid this highly significant loss of value by acting early on, both by adjusting packaging solutions in line with the PPWR requirements, and by reviewing their packaging operating model.

The specific implications of the PPWR requirements need to be evaluated on a case-by-case basis. The examples below show the potential implications of current packaging solutions. The enumerated challenges and recommended actions are merely illustrative, and are not exhaustive.

Example 1: Plastic bottle for dietary supplement product

This plastic bottle for dietary supplements is set to encounter significant challenges under the PPWR. The current design, with its multi-layer structure, its use of different plastics (such as the PP closure and HDPE bottle), and its large, fully adhesive label, falls short of the design-for-recycling criteria. The PPWR mandates that 70% of the weight of the packaging must be recyclable by 2030.

To tackle these issues, businesses could explore transitioning to mono-materials with established recycling streams, and using non-adhesive labels. Moreover, compliance with the 10% recycled content requirement for food-contact packaging can be supported by implementing careful monitoring of approved recycled materials.

Example 2: Chocolate bar packaging

The packaging of a typical chocolate bar is similarly vulnerable to the new PPWR regulations, particularly when it comes to recyclability and packaging minimization. Currently, this packaging often involves a multi-layer foil of polypropylene (PP) and aluminum. Several bars are then packed together in LDPE foil that is imprinted with logos, which complicates recycling efforts. Furthermore, the use of secondary cardboard packaging for display purposes, together with additional transport packaging, could be seen as excessive, posing a risk of non-compliance with (future) minimization targets.

Businesses can mitigate these risks by exploring alternatives such as mono-materials or other fully recyclable solutions. Another strategy could be to make the transition to paper-based packaging or to eliminate some layers entirely, such as the LDPE foil. As with the supplement bottle, increasing the recycled content in food packaging will require close attention to evolving material approvals.

Example 3: Miniature packaging for toiletries (such as for hotels)

The use of single-use plastic for miniature toiletries in hotels will be banned outright by 2030 under the PPWR, constituting a clear challenge for the industry. This regulation requires a complete redesign of packaging or even of the go-to-market strategy itself, possibly involving a shift toward a circular economy model.

A viable solution is to replace these single-use plastics with more sustainable options - such as refillable dispensers paired with recyclable aluminum cartridges - which take advantage of existing recycling infrastructures.

Example 4: Cream jar

The packaging of a cream jar is composed of multiple components, such as the lid, the jar, and a secondary packaging carton. These are made from different materials (PP, PET, and paperboard), which leads to significant recyclability challenges under the PPWR. The complex, multi-layer structure and direct printing without soluble colors cause recycling incompatibilities, making the recyclability grade C requirement (70% recycling efficiency) more difficult to attain.

To achieve compliance, businesses should simplify the design by using mono-materials and materials with established EU recycling streams. Moreover, plastics used for components that constitute more than 5% of the overall weight of the packaging require a minimum recycled content (30% for the PET jar and 10% for the PP closure). Since there is no food contact, compliance is more straightforward than for the plastic bottle in Example 1.

A strategic approach is crucial to navigate and comply with the PPWR

It is vital that companies take action to align with the forthcoming Packaging and Packaging Waste Regulation. The stakes are high. Non-compliance could result in severe financial penalties and corporate reputation damage. Moreover, achieving full regulatory compliance is likely to be a complex and time-consuming process, and proper implementation often takes up to two years. Any delay could therefore leave companies unprepared for the imminent changes, exposing them to considerable risk. On the other hand, by getting ahead of the game and responding to the requirements in a strategic way, and by transforming operating models to ensure compliance with changing requirements in the EU and globally, companies could potentially benefit from a positive financial impact.

The PPWR is complex, with numerous targets as well as varying implications depending on material, usage, and product type. When it comes to placing your company in a competitive position in the race for compliance, a structured assessment at the start of the process is therefore crucial. We tend to work with clients on four key steps to get this journey started:

1. **Map out the impact:** Conduct a detailed analysis by market and material and product categories, and perform a gap assessment to evaluate current practices set against full compliance requirements. Where relevant, we can expedite this assessment with BCG's proprietary GenAI-enabled regulatory analysis tool Policy Pulse.

2. **Prioritize areas of action:** Identify and prioritize the most critical products that require immediate attention.

3. **Drive to action:** Segment product and material portfolio to build a plan to redesign non-compliant SKUs through Design to Sustainable Value efforts and develop implementation roadmaps to guide the relevant changes in the operating model to enable ongoing compliance.

4. **Execute pilots:** Initiate pilots to begin the PPWR alignment process, and then use insights from these pilots to refine and enhance your overall compliance strategy.

Particular industries and individual businesses will need to prioritize different action areas and roadmaps. However, a number of typical responses can be observed that companies may explore as they prepare for the PPWR:

Redesign product packaging

Critically assessing packaging and exploring redesigns could help businesses align with regulatory targets, including waste reduction, recyclability, and the inclusion of recycled content. This may involve moving away from banned single-use plastics and substances, adopting new materials, and rethinking the overall design. Ideally, taking a Design to Sustainable Value approach, the redesign process does not only relate to compliance with PPWR and, thereby, increased sustainability of the packaging, but can be leveraged to also optimize for consumer value (e.g. functionality), cost per unit.

Identify and capitalize on new market opportunities

The regulatory landscape presents more than threats. It also opens up new market opportunities, particularly in areas such as reuse and refill services. Companies can explore new ventures aligned with these trends, such as take-back systems and washing services. Early adopters of sustainable packaging solutions could benefit from strengthened compliance and enhanced market positioning as sustainability leaders. Such shifts may also support the development of innovative business models that redefine customer relationships and operational practices.

Reap benefits from cost reduction

Compliance with the PPWR can give rise to cost efficiencies. By minimizing packaging, companies can reduce transport and storage costs and benefit from the lower fees associated with lighter, more efficient packaging. Furthermore, the increasing availability of recycled input materials through enhanced deposit systems and recycling streams will have an impact on supply and demand and therefore reduce the cost of recycled content. Companies that move quickly to redesign their packaging to meet extended producer responsibility (EPR) criteria can also secure competitive advantage by incurring lower fees than late adopters.

Secure early access to recycled content or sustainable materials

With the growing demand for recycled and sustainable materials, securing early access to them is crucial. Companies can benefit from ensuring sufficient recycled content to meet regulatory targets, particularly in markets where supply constraints and price increases are likely. Taking early action can enable a company meeting compostability and recycled content standards. Proactively sourcing these materials can strengthen companies' resilience to tightening regulations and market pressures.

Set up relevant partnerships throughout the whole supply chain

Given the complexity of compliance with PPWR requirements, collaboration across the supply chain will be essential. Businesses should set up partnerships to establish reuse and refill systems, and to source sustainable materials. Partnerships can facilitate exchange of best practices, innovation in packaging design, and the development of closed-loop systems. By working closely with suppliers, distributors, and service providers, companies can build integrated solutions that align with both regulatory demands and market expectations.

Enhance operating model and capabilities

Strengthening governance over packaging and packaging waste is vital for meeting the PPWR reporting requirements. Developing robust systems to track, manage, and report on packaging activities is key to ensuring compliance and enabling accurate product labeling. Integrating this labeling into the packaging design process is an important step in aligning with regulatory expectations.

By taking this proactive and carefully considered strategic approach, companies can both mitigate the risks presented by the PPWR regulation, and seize the many associated opportunities that arise.

About the Authors

Alexander Meyer zum Felde is a Partner and Associate Director at Boston Consulting Group in the Hamburg office. He is BCG's Global Lead for Circular Economy and Circular Packaging. You may contact him by e-mail at meyer.zum.felde.alexander@bcg.com.

Patrick Herhold is a Managing Director and Senior Partner at Boston Consulting Group in the Munich office. He is a member of the leadership teams of BCG's Climate & Sustainability and Energy practice areas. You may contact him by e-mail at herhold.patrick@bcg.com.

Alejandro Navarro is a Managing Director and Partner at Boston Consulting Group in the Amsterdam office. He leads BCG's Climate & Sustainability Practice for Consumer clients in Europe, the Middle East, and Africa, and leads the firm's Design to Sustainable Value offering. You may contact him by e-mail at navarro.alejandro@bcg.com.

Edmond Rhys Jones is a Partner and Associate Director at Boston Consulting Group in the London office. He co-leads BCG's Center for Sustainability Policy & Regulation. You may contact him by email at rhysJones.edmond@bcg.com.

Merle Stepke-Müller is a Principal at Boston Consulting Group in the Copenhagen office. Merle is a core member of BCG's global circular economy team. You may contact her by e-mail at stepke.merle@bcg.com.

Maren Mende-Benford is an Associate Director at Boston Consulting Group in the Munich office. Maren specializes in Climate and Sustainability, specifically ESG Strategy and Transformation as well as regulatory topics. You may contact her by e-mail at mende-benford.maren@bcg.com.

Laura Peano works in the Zurich office of Quantis, a BCG company. She is Quantis' Global Plastics and Packaging Lead. You may contact her by e-mail at peano.laura@quantis.com.

Miriam Benedi Diaz is Lead Knowledge Analyst at Boston Consulting Group in the Madrid office. She leads BCG's Circular Economy Knowledge Team. You may contact her by e-mail at benedidiaz.miriam@bcg.com.

For Further Contact

If you would like to discuss this report, please contact the authors.

Acknowledgments

The authors are grateful for contribution and expert support from many BCG colleagues. In particular to Roland Haslehner, Shalini Unnikrishnan, Jennifer Aylwin, Christine O'Brien, Eileen Cowdery, Mara Kronauer and Theresa Stemmler.

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