WHITE PAPER

How data, digital and AI enable circular packaging and waste systems change

2024

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Executive summary

As the global community accelerates efforts to address plastic pollution in line with the United Nations (UN) global plastics treaty, the consumer-packaged goods (CPG) sector has a critical role in reducing plastic waste and enhancing recycling outcomes. Achieving circularity in packaging is not only central to meeting international climate commitments but also essential for staying ahead of tightening regulations and rising consumer expectations.

This white paper draws on insights gained from developing our digital data and decision-making tool, Plastic IQ. It presents key findings on the existing gaps and potential opportunities in packaging data, which, if addressed, could drive substantial progress in sustainable plastics packaging management.

Main findings:

- **Currently, the packaging industry faces several key challenges in moving toward a more circular economy.** These include data scarcity, competing strategic priorities, and the need to account for diverse local contexts in packaging design and disposal. Without access to accurate, granular, and harmonized data and definitions, the industry cannot make informed decisions and transparently track progress toward circularity.

- **Business as usual represents significant risks:** legal, commercial, economic, operational, and environmental. If these risks are not mitigated, they could accumulate, resulting in substantial environmental damage and financial losses amounting to millions of dollars for individual companies.

Recommendations:

- **Establish a global packaging data platform:** It is critical for the industry to make a step change in its packaging data capabilities to inform decisions across the markets they operate in, as well as to track indicators showing how those decisions align with climate and business objectives.

- **Ensure granularity of data:** Three types of data that would significantly enhance packaging decision-making today are 1) market recycling rates (both technical and actual), 2) design-for-recycling guidelines for each packaging format, and 3) an overview of the latest policies across various regions.

- **Foster collaboration within the private sector and between public and private entities:** Companies must work together to align definitions, metrics, and sustainability objectives, creating a unified approach across the industry. Partnerships with governments and regulatory bodies are critical to ensure that public policies support and accelerate private-sector efforts toward sustainable packaging, and vice versa.

In alignment with the goals of the UN plastics treaty, prioritizing data-driven solutions and fostering cross-sector cooperation will position the packaging industry to effectively transition to a sustainable circular economy, addressing both regulatory requirements and environmental imperatives.

Vision for optimized packaging decision-making

Achieving meaningful, system-wide change requires a holistic approach to packaging decision-making that must balance environmental impact, economic feasibility and consumer expectations. This holistic approach requires collaboration across the plastics value chain. Companies must design optimized packaging for specific markets, considering differing levels of waste management maturity. National and regional governments must prioritize investment in building waste management systems, consumers must actively engage in separating waste at its source, and data providers should ensure transparency throughout the value chain to drive informed decision-making by all stakeholders. By aligning on shared objectives, pooling resources and developing innovative, minimized, and standardized packaging solutions, stakeholders can make recycling and reuse processes more efficient.

In this white paper, references to packaging will encompass both general packaging concerns and plastic packaging in particular. Plastic is one of the most-used packaging materials globally. However, it is the largest contributor to climate change among packaging materials, responsible for approximately 720 million tons[1] of CO_2e emissions annually, compared to the 1.5 to 2.5 billion tons[2] emitted by the entire global packaging sector. Additionally, plastic packaging has the lowest recycling rates among packaging materials, with only 9% of plastic waste currently being recycled[3]; the majority ends up in landfills or pollutes the environment, with 19 to 23 million tons of plastic leaking into aquatic ecosystems each year[4].

This white paper focuses on how data can support the transformation of the entire packaging system and value chain, galvanizing stakeholders and helping to drive better decision-making by CPG companies and retailers.

Introduction

The urgency to adopt sustainable packaging solutions is intensifying, driven by escalating plastic pollution and the imperative to meet ambitious climate targets. The environmental impact of plastic waste has worsened significantly in recent years, putting mounting pressure on CPG companies and retailers from governments, civil society, consumers and investors to address these unintended consequences of the current linear packaging model. As negotiations for the global UN plastics treaty near completion and environmental impacts continue to grow, the demand for transformative change has become more critical than ever.

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What do we mean by
"The System"?

The packaging system is a complex, interconnected network of key stakeholders, including packaging producers, brands, governments, regulators and consumers. Each stakeholder plays a critical role in the flow of materials from production to disposal, with their actions influencing and impacting one another throughout the supply chain. In the context of plastic packaging, here are the key dynamics within this value chain.

Table 1 – Plastic packaging system and dynamics

Plastic packaging PRODUCTION

- The growth of plastics production from virgin polymers is expected to remain robust (2.7% CAGR in 2021-27 versus 3.9% in 2005-20)[5]

- Despite pressures on the sector, 96 new plastic polymer production assets came online between 2019 and 2021[5].

- The global increase in the share of post-consumer recycled content was 1p.p.[6]

- Bio-based plastics make up approximately 1% to 2% of the total plastic packaging market[7].

Plastic packaging CONSUMPTION

- The market is highly fragmented. For example, the top 10 consumer packaged goods companies collectively account for approximately 10% to 16% of the world's plastic packaging usage[8].

- The fragmentation of the retail channels varies widely. In the U.S., the top 5 retailers hold over 40% of the grocery market[9], while in India, traditional "mom-and-pop" stores represent 85% of the food grocery market[10].

- Signatories of the Ellen MacArthur Foundation (EMF) Global Commitment are likely to miss their set 2025 sustainability goals.

- 75% of people support a treaty that creates global rules for governments to end plastic pollution[11], yet only about 49% report regularly recycling their household waste[12].

Plastic packaging END-OF-LIFE MANAGEMENT

- Only 14% of plastic packaging is collected for recycling globally[13], with rates varying widely by country based on local legislation and investment in waste management infrastructure.

- European nations, along with South Korea and Japan, lead in implementing legislative goals for sustainable packaging and the circular economy.

- Waste management effectiveness varies worldwide. Slovakia, Germany, and South Korea, have some of the highest plastic recycling rates (60%[14], 51%[14], and 57.5%[15], respectively), while the Philippines, India, Indonesia and China experience the highest levels of mismanaged plastic.

Plastic packaging GLOBAL REGULATION

- In 2022, UN member states adopted *Resolution UNEA-5.2, agreeing* to develop a legally binding global treaty by 2024 to end plastic pollution. This is a major step toward a comprehensive global framework addressing the full lifecycle of plastics.

- *The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal*, amended in 2010 to include plastic waste, encourages countries to manage plastic waste domestically and invest in recycling and disposal infrastructure.

- Over 40 countries have implemented EPR regulations for plastic packaging, including the EU states, Japan, China, Chile, South Africa, Australia, and others.
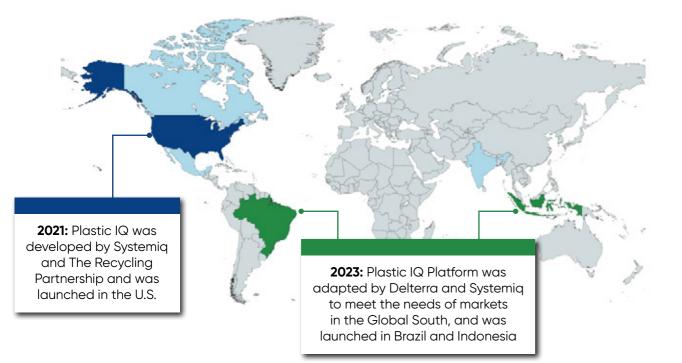
Our journey to enable better packaging decision-making

Plastic IQ is an initiative led by Systemiq in collaboration with Delterra and The Recycling Partnership. Plastic IQ aims to provide access to data for better decision-making in packaging design and end-of-life impact. Its vision is to give companies the "system intelligence" needed for informed packaging decisions.

Since its U.S. launch in 2021, and subsequent expansions into Brazil and Indonesia in 2023, Plastic IQ has developed tools to support better plastic packaging practices, strategies and capabilities. The Plastic IQ team has trained over 100 users across these regions, held design workshops with global brands and retailers to refine its value proposition, and gathered user feedback to continuously improve the tool's capabilities and scope.

Figure 1 – Evolution of Plastic IQ

2021: Plastic IQ was developed by Systemiq and The Recycling Partnership and was launched in the U.S.

2023: Plastic IQ Platform was adapted by Delterra and Systemiq to meet the needs of markets in the Global South, and was launched in Brazil and Indonesia

Systemiq and Earth Action (EA) recently announced a partnership to build on the Plastic IQ experience by developing a global packaging data platform, tentatively named the "Packaging Data Hub." In collaboration with the Ellen MacArthur Foundation (EMF), the Consumer Goods Forum (CGF), the World Wildlife Fund (WWF), and other key organizations, the Hub aims to harmonize packaging data globally and provide open access to most of this data.

Current challenges

Many companies have set ambitious sustainability goals, and sustainability teams are increasingly supported by leadership willing to embrace transparency, set ambitious targets, and adopt sustainable practices. However, despite commitments from major companies to invest in and implement circular packaging solutions to reduce plastic waste's environmental impact, significant challenges remain in scaling these efforts across diverse markets. In discussions with over 100 representatives from the consumer-packaged goods industry, we have identified three critical barriers that hinder the path toward achieving a fully circular, sustainable packaging system.

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Data scarcity for decision-making

One of the primary challenges companies face is the lack of accessible, reliable data to inform decisions across their various markets. Decision-makers need accurate data on waste management maturity—including collection, sorting, recycling infrastructure, and disposal options—along with greenhouse gas (GHG) emissions for each packaging type and an understanding of the evolving regulatory landscape. Accessing reliable data on plastic end-of-life is notoriously difficult, with assumptions often substituting for grounded data. Standardized sources, tools, frameworks, and methodologies across the industry would improve data sharing and enable better decision-making, helping to address this barrier.

Competing priorities within companies

Another major hurdle is the absence of an effective methodology to evaluate packaging solutions' impacts on environmental and economic indicators. Consumer goods companies and retailers need packaging that aligns with circular economy principles, reduces GHG emissions, minimizes primary materials and remains high-performing, cost-effective and safe for consumers. One respondent likened this challenge to an intricate game of chess. Additionally, inconsistencies in strategic priorities and ambition levels between companies complicate collaboration, adding further complexity.
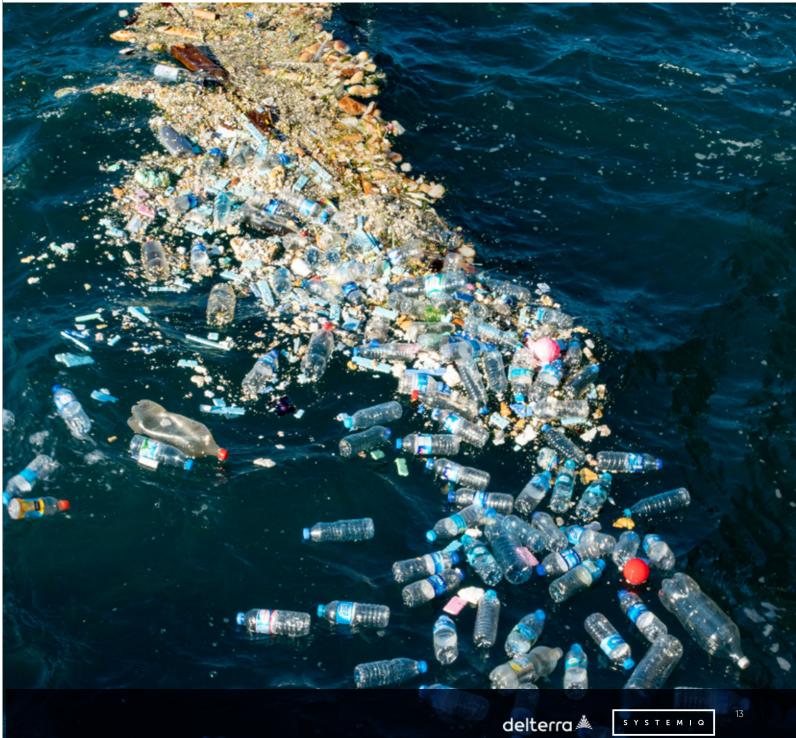
Designing for local contexts

Packaging design effectiveness is heavily influenced by local factors such as infrastructure, regulations and consumer behavior. Product packaging changes often require years and significant investment, with decisions typically made at global headquarters while needing to account for varied local variables.

For instance, LDPE packaging in Brazil is more likely to be recycled in large metropolitan areas like São Paulo or Belo Horizonte, but in smaller cities, it may end up in landfills or the environment. By contrast, PET packaging has a higher likelihood of being recycled in both large and small cities. Meanwhile, various levels of government in Brazil are advancing legislation on sustainable packaging and recycling, from federal subsidies for companies investing in recycling infrastructure to local bans on materials, such as the ban of single-use plastic bags in supermarkets in Brasília.

It is crucial to recognize and adapt to evolving local regulations and infrastructure to ensure that new packaging aligns with the waste management system when it reaches the market.

Without a clear roadmap to more sustainable packaging based on accurate, detailed, and standardized data, the industry risks failing to turn commitments into meaningful progress. **Continuing with the current approach is simply bad for business, and can lead to a number of risks,** including legal (e.g., lawsuits against companies for misleading claims), commercial (e.g., products being delisted for non-compliance), economic (e.g., higher EPR fees for non-recyclable packaging), operational (e.g., manual, inefficient processes to collect and report on packaging data, often duplicating efforts), and environmental (e.g., lower recycling rates, higher greenhouse gas emissions and more use of virgin plastic). Each of these can cost companies millions, even before accounting for broader environmental and societal risks.

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Imagine a future where sustainable packaging decisions are driven by an integrated ecosystem of reliable data, and cutting-edge, AI-driven optimization. In this scenario, every packaging decision is informed by accurate, reliable, real-time data—covering everything from material selection and supply chain logistics to disposal options, collection, sorting and recycling infrastructure and applicable policies. Companies can anticipate potential policy changes before they occur, adapting their strategies proactively rather than reactively. Reporting processes are fully automated, reducing administrative burdens and freeing teams to focus on innovation and implementation. The transition from strategy to action becomes seamless, with AI algorithms optimizing solutions that balance environmental impact, cost-effectiveness and consumer satisfaction.

The current approach, where companies individually decide on packaging and separately invest in recycling infrastructure, is inefficient, financially wasteful, and leads to underutilized infrastructure due to insufficient material flow, especially in the Global South. Each company managing its own data collection and processing often duplicates efforts, adding unnecessary costs. A centralized data initiative could eliminate this duplication and provide third-party certification for data accuracy, boosting credibility and harmonization.

A better **solution is for companies to use shared data to make coordinated packaging decisions in specific markets. This would allow them to co-invest in recycling infrastructure** through direct investments, industry initiatives, dedicated nonprofit organizations, or funds like Circulate Capital[16]. For instance, Dow recently announced a partnership with the Brazilian multinational Ambipar to explore transforming post-consumer plastic waste into new products, with the goal of enhancing recycling and waste management in Brazil[17].

In this vision, the **economic benefits of sustainable packaging are fully realized.** Companies no longer face a trade-off between profitability and environmental responsibility; instead, the two goals align. Packaging designs are optimized to reduce material use, lower greenhouse gas emissions, and improve recyclability—all while remaining cost-effective and meeting consumer demands. This synergy between better economics
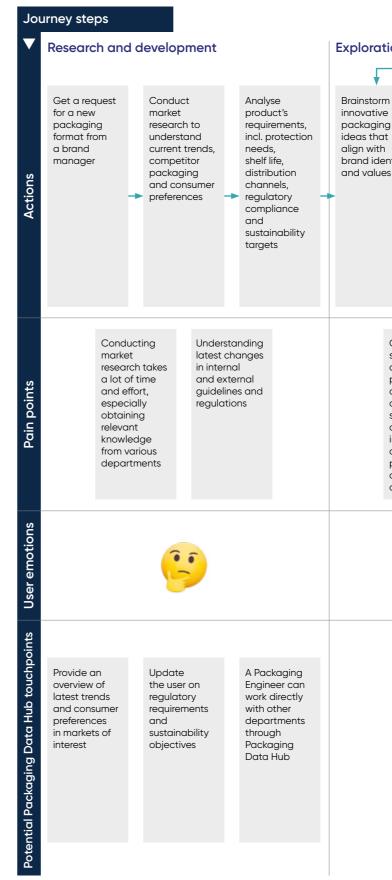
The ideal scenario

and better environmental outcomes becomes the new standard in packaging.

We can draw parallels to the transformation already underway in the climate sector. In the quest to decarbonize, data and AI are playing pivotal roles in driving transparency and improving decision-making. AI models are now used to predict energy demand, optimize renewable energy deployment, and even forecast the financial impacts of climate risks. A similar approach can revolutionize the packaging industry, AI can help companies identify the most sustainable materials, predict the lifecycle impacts of packaging decisions, and automate compliance with evolving regulations.

In this future, companies are not just reacting to change—they are leading it. By leveraging the power of data and AI, they can stay ahead of regulatory developments, make informed decisions that align with both environmental and economic goals, and drive a systemic shift towards a fully circular, sustainable packaging ecosystem.

As an illustrative use case, consider a company preparing to launch new product packaging. A packaging engineer receives a request from a brand manager to provide packaging options that meet product safety standards, comply with the regulations of the target markets, and align with the company's sustainability goals. One of the current challenges is the significant amount of time required to conduct market research, gather the latest guidelines and regulations, and assess environmental impacts, including actual recycling rates for different packaging formats. Imagine if there were a shared industry database with reliable, verified data that packaging engineers could access easily — this would significantly reduce the time needed for research, exploration and design conceptualization.

Figure 2 – New packaging launch use case

Potential impact

At the company level

Integrating reliable data and AI-driven optimization will have an immediate, transformative impact on decision-making, improving accuracy and efficiency while promoting industry standardization.

ACCURACY

In an ideal scenario, brands will be empowered to make more informed and precise packaging decisions by accessing the best available data, consolidated in a single platform. This will enable companies to select packaging formats that are recyclable in specific markets while ensuring compliance with both current and forthcoming regulations.

EFFICIENCY

The system could boost efficiency and reduce costs in three primary ways: (1) centralizing the labor-intensive process of data collection and management, eliminating the need for each company to gather and maintain its own data; (2) leveraging scale to drive automation and data visualization, reducing reliance on inefficient spreadsheets; and (3) consolidating all data in one location, streamlining and automating internal and external reporting procedures.

INDUSTRY STANDARDIZATION

Cross-industry collaboration can drive alignment on data, sources, frameworks and definitions, lending credibility to the sector. This unified approach will demonstrate to stakeholders that the industry is serious about addressing the packaging challenge in a consistent and transparent way.

At the broader system level

Armed with better data, companies can dramatically improve their packaging strategies, resulting in less packaging overall and more efficient designs. By optimizing material use and design, businesses can reduce the volume of packaging needed, thereby minimizing waste at the source.

Improved recycling rates for packaging that remains in circulation is another potential outcome. **Standardizing packaging in specific markets could lead to greater investment in waste management, including recycling systems (collection, sorting and recycling).** With consistent, better-designed, easier-to-recycle packaging supported by more efficient recycling infrastructure, a greater proportion of materials will remain within the circular economy, reducing the need for virgin resources and minimizing waste.

The positive ripple effects of these improvements extend beyond the packaging itself. Reducing packaging volume and enhancing its sustainability helps companies lower GHG emissions, supporting global climate goals. Increased packaging circularity—achieved through improved design and recyclability—also advances broader sustainability metrics, such as those outlined by the Taskforce on Nature-related Financial Disclosures (TNFD).

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How we get there

1 | Collecting **accurate recycling data** for each format across global markets is complex. Two essential questions are: a) Is the packaging technically recyclable? and b) Is the packaging recycled in practice and at scale in a given market? Currently, answering these questions requires a time-intensive process of consulting and verifying data from multiple sources for each country, filling data gaps with assumptions and regularly updating the information.

2 | The need for accessible **design-for-recycling guidelines** presents another challenge. While key global guidelines exist, such as the Association of Plastic Recyclers (APR) Design® Guide widely used in North America, the RecyClass Design for Recycling Guidelines used in Europe, and the Consumer Goods Forum's Golden Design Rules for Plastic Packaging, many countries have their own guidelines tailored to local recycling infrastructures and regulations. An estimated 25 to 30 countries have local plastic design-for-recycling guidelines, with this number growing as nations recognize the importance of sustainable packaging design for a circular economy.

3 | Companies must navigate an array of **local plastic packaging-related legislation**, including EPR, single-use plastic bans, recycled content requirements, plastic packaging taxes, circular economy initiatives and voluntary plastic reduction efforts. Over 160 countries have implemented at least one such policy or piece of legislation, and this number is rising as global awareness of plastic pollution increases. These policies often change frequently, sometimes with little notice, making agility and a proactive approach essential.

What data is needed for better decision-making

Three types of data that would significantly enhance packaging decision-making today are 1) **market recycling rates** (both technical and actual), 2) **design-for-recycling guidelines** for each packaging format, and 3) a view of the **latest policies** across various regions. Industry estimates indicate there are over 5,000 plastic packaging formats in use globally. This estimate reflects a wide variety of designs, materials, sizes and applications, and may fluctuate with classification methods and new packaging solutions.

The Packaging Data Hub aims to make this critical data available to brands and key stakeholders by aligning definitions and leveraging both global and local databases and expertise. For any given packaging format, key end-of-life metrics and policy implications will be provided. This foundation will enable companies to make better-informed decisions, driving progress toward more sustainable packaging solutions.

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Figure 3 – Illustrative data structure provided by Packaging Data Hub

EXAMPLE - PACKAGING FOR INSTANT NOODLES IN INDONESIA

- **Primary Container:** The noodles are typically housed in a polypropylene (PP) cup or bowl. PP is chosen for its durability, heat resistance, and cost-effectiveness.
- **Lid:** The container is sealed with a polystyrene (PS) lid. PS is favored for its rigidity and ease of forming a tight seal, ensuring the product's freshness and protection.

1 - PACKAGING ATTRIBUTES

Number of elements	Packaging element	Material combination	Material	Material format	Material source	Share of each material	Total weight	Color	Transparency
1 of 2	Primary Container	Monomaterial	Plastic	PP	Virgin fossil-based	100% (monomaterial)	10g	Multicolored	Opaque
2 of 2	Lid	Multimaterial	Plastic	PS	Virgin fossil-based	100% (monomaterial)	2g	White	Opaque metalized

2 - PACKAGING END-OF-LIFE

Packaging element	Exported	Incinerated	Landfilled	Mismanaged	Recycled	Flag
Primary Container	1.6%	0.0%	16.3%	80.1%	2.0%	Not recycled at scale in this geography
Lid	1.5%	0.0%	16.7%	73.9%	7.9%	Not recycled at scale in this geography

3 - POLICY & COMPLIANCE

Flagged element	Geography	Policy	Responsible authority	Reference in document	Compliance	Scope	Aplication	Policy type	Policy type details	Flag	Explanation
Primary Container	Indonesia	Regulation No.75 (2019)	Ministry of Environment and Forestry	Chapter II	Mandatory in transition	SKU	Effective	D4R requirements	Urge to move to more recyclable formats	Not recycled at scale in this geography	Waste Reduction Goals and Methods, ensured by Waste Reduction Strategies in chapter II urges for minimal waste packaging and use of recyclable materials
Lid	Indonesia	Regulation No.75 (2019)	Ministry of Environment and Forestry	Chapter II	Mandatory in transition	SKU	Effective	D4R requirements	Urge to move to more recyclable formats	Not recycled at scale in this geography	Waste Reduction Goals and Methods, ensured by Waste Reduction Strategies in chapter II urges for minimal waste packaging and use of recyclable materials

Data source(s):
Packaging End-of-Life: Plasteax (2021)
Policy and compliance: Ministry of Environment and Forestry Regulation No.75 (2019), Waste Reduction Roadmap by Producers
Original policy document (In Bahasa)

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Industry investment in reliable data: Reliable data serves as the foundation for informed decision-making, helping companies align with sustainability targets. Investing in accurate, comprehensive data on the environmental and climate impacts of packaging is crucial for driving meaningful change across the industry. This includes understanding the end-of-life fate of plastic packaging in various countries and regions. Equally important is **data democratization**—making data accessible and standardized across the industry. Without a shared, accurate, single source of truth, even the most sophisticated digital and AI solutions will fall short. These technologies are only as effective as the quality of the data that informs them, making robust data infrastructure a vital area for industry-wide investment.

Collaboration between data and digital solution providers: To maximize the positive impact on plastic packaging and sustainability, **collaboration between data providers and digital solutions developers is essential.** Innovative partnerships between these stakeholders can facilitate the integration of accurate data into digital tools, enabling more effective decision-making and system-wide change. By pooling resources and expertise, the industry can develop comprehensive solutions that offer real-time insights, improve transparency, and set actionable strategies for addressing the complexities of plastic packaging waste.

Collaboration within the private sector and between public and private entities: Companies must work together to align definitions, metrics, and sustainability objectives, creating a **unified approach across the industry.** Partnerships with governments and regulatory bodies are critical to ensure that public policies support and accelerate the private-sector efforts toward sustainable packaging. Only through such collaboration can we achieve consistent progress on circular economy initiatives, address regulatory requirements, and build infrastructure that supports a global shift toward sustainable packaging practices.

What we believe is needed
TO MAKE CHANGE HAPPEN

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Why this is time-critical

Collecting reliable data on plastic packaging across various countries presents significant challenges, particularly when aiming for detailed insights by specific format types or at finer geographic levels, such as by state or city. For instance, our data collection efforts in Brazil and Indonesia required full-time team members working for six months to reach the required level of data quality.

Based on our experience, key aspects of effective data collection include:

- **Evaluating source credibility:** determining the reliability and accuracy of data sources is essential, as quality varies widely by region and data type. This involves verifying each source's reputation, methodology and recency to ensure consistency and trustworthiness. These challenges are especially pronounced in the Global South. For instance, while European countries have official sources for recycling rates, such as Eurostat, countries like Brazil and Indonesia do not have an officially accepted standard. This puts the recycling rate in dispute, being calculated using different metrics by different organizations. Reaching a credible and trustworthy source in these regions includes extra validation steps.

- **Collaborating with local experts:** engaging with local specialists is crucial, as they bring context-specific knowledge and insights that can reveal hidden data points and nuances. These partnerships help bridge cultural and language gaps, ensuring the data reflects local realities more accurately. For example, our team in Brazil discussed their findings with multiple stakeholders across the value chain —including industry associations, researchers, civil society and waste pickers representatives —to validate the results.

- **Addressing data gaps:** many data sources contain incomplete information, making it necessary to fill gaps with well-founded assumptions. This process involves aligning assumptions with industry standards or local patterns to maintain reasonable accuracy.

- **Data cleaning and structuring:** raw data often requires extensive cleaning to remove inconsistencies, errors and redundancies. Structuring and organizing this data correctly is essential for it to be usable, as it enables accurate comparison and synthesis. By doing so, our team was able to adjust existing data points in Brazil and Indonesia into more accessible structures for deriving insights, reaching granular data points such as the estimated share of losses during sorting processes in cooperatives in Indonesia.

- **Processing for insight generation:** data must be processed and analyzed in a structured way to extract meaningful insights for a given context.

Each of these steps requires careful planning, dedicated resources and consistent refinement to ensure data integrity and actionable outcomes.

To generate meaningful insights from national or regional data, **CPG companies must often gather and refine their own data across product categories and packaging types.** This internal data collection enables them to align external market data with specific packaging formats and brand-level metrics, making insights more actionable. However, this also requires time and cross-functional work across departments.

This collective, system-wide effort must begin as soon as possible to provide the standardized, high-quality data required to inform and enforce an effective global plastics treaty. A coordinated approach across sectors and geographies will be essential in setting up the data foundations needed for meaningful and enforceable commitments.

In conclusion,
The time is NOW

The year 2025 will be pivotal for packaging globally. With the completion of the UN plastics treaty negotiations, the rollout of regulations worldwide—including Europe's Packaging and Packaging Waste Regulation (PPWR) and other regulations coming into play in the U.S., Brazil, China, India, and Southeast Asia—the time is now for the industry to step up system-wide understanding and harmonization. Initiatives like the EMF's Global Commitment and the CGF's Golden Design Rules, which are being adapted at the local level, will require market-level data to drive this shift.

This white paper has outlined the pressing need for transformation in the packaging industry and the critical roles that data, collaboration, and innovation play in driving meaningful change. Scaling sustainable packaging solutions across diverse regions presents challenges—such as the lack of reliable data, competing priorities, and the complexities of local contexts—that require a collective response.

To achieve a transparent, fully circular, and sustainable packaging system, the industry must collectively invest in accurate and comprehensive data on the current and potential environmental and climate impacts of packaging.

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Real Change, At Scale.