



The Association for Packaging
and Processing Technologies



**PACKAGING
SUSTAINABILITY:
A CHANGING LANDSCAPE
EXECUTIVE SUMMARY**

2020



Packaging Sustainability Has Moved Beyond a Trend, It's a **Global Shift**

“

Our goal is for total recyclable packaging by 2025 . . . eliminate non-recyclable plastics, encourage the use of plastics that allow better recycling rates, and eliminate or change complex combinations of packaging materials.

Packaging and Processing Engineer,
Global Leader in Food

”





The Association for Packaging
and Processing Technologies

Packaging Sustainability: A Changing Landscape EXECUTIVE SUMMARY

A report on how sustainable packaging initiatives at CPGs are affecting machines, materials, and packaging formats.

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“

There is not one answer that fits all sustainable initiatives; it takes a group to review and recommend the best ways to achieve sustainable packaging.

Chief Executive Officer,
OEM

”

Approximately 1 in 4 CPGs Interviewed are Making Machine Purchases or Modifications Specifically to Address Packaging Sustainability Goals

A CPG's decision to buy new equipment or modify existing equipment depends on many factors in their drive toward more sustainable packaging. Some CPGs are looking to buy new equipment, while some CPGs are looking to make modifications or alterations to existing machines when specifically addressing sustainable packaging changes.

Food manufacturers are more often retrofitting existing machines compared to other product segments due to the desire to use plant-based materials that can require machine tweaking.

Beverage manufacturers are twice as likely to purchase new equipment when compared to retrofitting, mainly due to shifts in package formats.

The majority of **personal care companies** seek new equipment to replace legacy machines for both primary and secondary operations as they continue to automate and design refillable product solutions.

Household product manufacturers are looking for versatile filling machines as well as automating end-of-line operations. Retrofits are needed on secondary packaging machines to handle the variances in PCR content in corrugated materials.

Pharmaceutical companies are the least likely to make machine modifications due to strict FDA process validation, and are looking for new machines to fill, index, cap, and seal, as well as robotic and automated solutions for end-of-line.



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CPG PRODUCTS ARE MOVING TO SUSTAINABLE PACKAGING



Reduce

Minimizing packaging to reduce waste.



Recycle

Using packaging materials that can be remade into new products.



Reuse

Packaging designed to be returned for multiple uses.



Reformat

Redesigning packaging using sustainable materials to replace non-recyclable materials.



Renew

Choosing packaging materials from resources that can be renewed for a circular economy.





SECTION ONE EXECUTIVE SUMMARY

Sustainability

Avoid the depletion of natural resources in order to maintain an ecological balance.

Sustainability has become an important part of many companies' overall brand and image story. One of the key aspects of working toward a more sustainable production model is a focus on improving the environmental friendliness of product packaging.

In the last decade, consumer knowledge and concern regarding ocean pollution, low rates of recycling, and the use of non-renewable resources in packaging has increased. In this report, CPG manufacturers share their insights on how they are

examining their own packaging formats, materials, and operations to ensure they are in line with the environmental outlook of today's consumers.

While this report focuses primarily on sustainability initiatives that involve packaging, CPGs also mentioned several other sustainable strategies, including the efficient use of water and electricity, as well as the overall reduction of greenhouse gases.

FORMAT OPTIONS Sustainable Packaging



Reduce



Recycle



Reuse



Reformat



Renew

“

Packaging sustainability: it's just the right thing to do. Today, it's top-of-mind.

**Manager, Packaging R&D,
Shelf Stable Products**

”



Sustainable Packaging is Becoming a Major Business Driver, Demanding Active Collaboration With All Partners



THE GLOBAL SUSTAINABLE PACKAGING MARKET

The global sustainable packaging market, as reported in total value of revenue, was estimated at \$220 billion in 2018 and is predicted to reach \$280 billion by 2025, growing at a CAGR of approximately 6%.



Includes packaging that is recyclable, biodegradable, compostable, or defined as green.

Compiled from multiple sources listed in Appendix A. (In U.S. dollars)

“

Our greatest obstacle is the bottom line: if the cost per package is similar, we might consider implementing more sustainable packaging that doesn't compromise quality or the package appeal.

Corporate Engineering Manager,
Store Brand Food Manufacturer

”

TOP FIVE:

Drivers of packaging sustainability:

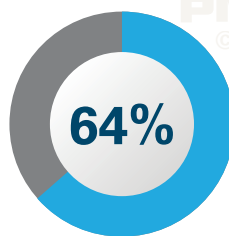
- Consumer brand perception
- Competitive pressure
- Environmental advocates
- Top-down company culture
- Good stewards of the planet

Functional machine improvements to achieve packaging sustainability:

- Reliability
- Flexibility
- Automated changeover
- Cleanability
- Sensor feedback

Barriers to accelerating packaging sustainability:

- Cost justification
- Material variations and availability
- Machine alterations
- Dedicated manpower
- Lack of vision



Nearly 2 of 3 brand owners cite added costs as the #1 reason that slows down the process of applying more sustainable packaging solutions to their products.





MATERIAL Characteristics and Changes to Achieve Sustainable Packaging:

- Use more recyclable materials.
- Lightweight materials.
- Reduce plastic usage.
- Reduce the materials used.
- Increase post-consumer recycled (PCR) content.
- Investigate bio-based alternatives.
- Reduce material loss (waste) during production.
- Reduce package size to use less materials.
- Minimize overall package weight.
- Explore circular package reuse and refilling.
- Direct print to reduce paper labels.
- More paperboard options.
- Introduce mono-material paper.
- Innovate mono-material bio-based plastics.
- Replace aluminum layer in flexible film to achieve a transparent barrier substrate.
- Scratch-resistant properties.

As CPGs Pursue Opportunities in Sustainability Pertaining to **Materials and Packaging Formats**, There can be an Impact on Their **Machines**.

At times, OEMs need to make machine modifications or alterations to accommodate sustainable packaging format and material changes.

MACHINE Modifications or Adjustments Requested to Achieve Sustainable Packaging:

Primary Packaging

- Broader machine tolerances are needed as materials use more PCR content.
- Any reduction in material weight requires operational adjustments.
- Ability to handle mono-materials as they gain popularity.
- Temperature tolerances (such as melting point) must be considered for new sustainable material options.
- New, thinner plastics can break more easily during FFS.
- Sealing integrity must not be compromised in a switch to more sustainable materials.
- Paper packaging is more prone to tearing at higher speeds and needs improved tension variances.
- Thinner materials require gentler conveying along the entire line.
- Rejection parameters need to be adjusted for thinner materials.

Secondary Packaging

- Shrink film properties change as PCR content increases versus virgin materials, and machines need to handle both.
- Line speed is impacted with increasing amounts of PCR content in corrugated; requires broader tolerance range.
- Reduce adhesive melting points in case erecting and sealing to minimize material usage.
- Eliminating/reducing corrugated materials requires innovative bundling and shrink wrapping solutions.
- Virgin fibers are being replaced with recycled materials causing issues with case erecting, packing, and adhesive sealing (such as adhesive not properly adhering to recycled fiber materials).
- Machines need to run different style boxes to accommodate sustainability strategies, such as using the right size box.
- Secondary packaging machines must be able to handle material reduction strategies, such as lightweight corrugated.

The list above are examples of the challenges CPGs are facing when moving to more sustainable packaging and are intended as guidelines for OEMs to explore application details with direct customers.

Opportunities for OEMs to be **Proactive** in Helping CPG Companies Meet their 2025 Goals for Sustainable Packaging

A close exchange between material supplier, brand producer, and packaging machine manufacturer is necessary for a successful sustainable package implementation.

“

There's an overall industry initiative for many companies to be 100% recyclable in the years ahead, but more companies need to think about implementation strategies.

**VP Technology and Environment,
Packaging Expert**

”

As CPGs investigate packaging materials and initiate format changes, they are looking for innovative solutions for barrier properties and material quality. They are seeking guidance from industry suppliers on processability, machine design, and compliance with regulations. OEMs should look to implement a process by which machine modifications can be measured against performance.

CPG Manufacturers' Recommendations to OEMs and Material Suppliers to Help Them Achieve Their Sustainability Goals:

INVESTIGATE ▶

- Find out what packaging changes your CPG customers are considering that are driving sustainable goals and closely coordinate with material manufacturers.
- Inquire about getting involved earlier in the design concept as CPGs investigate new materials.
- Identify packaging changes that have an immediate machine impact, as opposed to those that will require more time-consuming redesign.
- Nearly half of CPGs interviewed agree that overcoming machine handling issues with new materials is part of the process.
- Brand owners need to educate consumers on how sustainable their products and packaging are; find out what label changes they are considering. Do they have a plan to further educate consumers, or do they require additional guidance and advice?
- Find out if your customers are designing packaging for a more sustainable supply chain and if they are considering mono-material solutions, which can require machine modifications.

INITIATE ▶

- Schedule a packaging idea-gathering meeting with your CPG customers to understand the impact their packaging changes will have on existing machinery, if any.
- Work with the material suppliers to test new materials during the innovation process.
- Create a community to exchange best practices, experiences, and collaboration to support higher rates of material recovery.
- Equipment has been designed for certain materials and changes may cause problems; discuss the issues candidly with CPGs.
- Consumers rely on the label to convey information on ingredients, product attributes, production methods, and recycling instructions; find out what labeling requirements will help tell their sustainability story.
- Recommend sustainable packaging solutions that have been successful in protecting the package safely through the entire supply chain.

INNOVATE ▶

- Recommend machine modifications that will be ready and in place as packaging changes move to the production line.
- Sometimes an entirely new line of machinery might be the answer when switching to a new packaging format; bring forward machines that are flexible and adaptable.
- Flexible machinery is key and often requires ongoing modification as more shelf-ready packaging and e-commerce-ready packaging are utilized.
- Machines will need to be capable of accommodating imperfections in materials as material gauge is reduced, focusing on rejection rates to reduce material waste.
- Offer greater label sustainability: reduce cycle times, minimize label rejects, use biodegradable inks and adhesives, and offer options to speed up label changeover.
- Explore solutions in packing and palletizing that will minimize material usage; in some cases, properly recalibrating a machine such as a stretch wrapper can significantly reduce material usage.

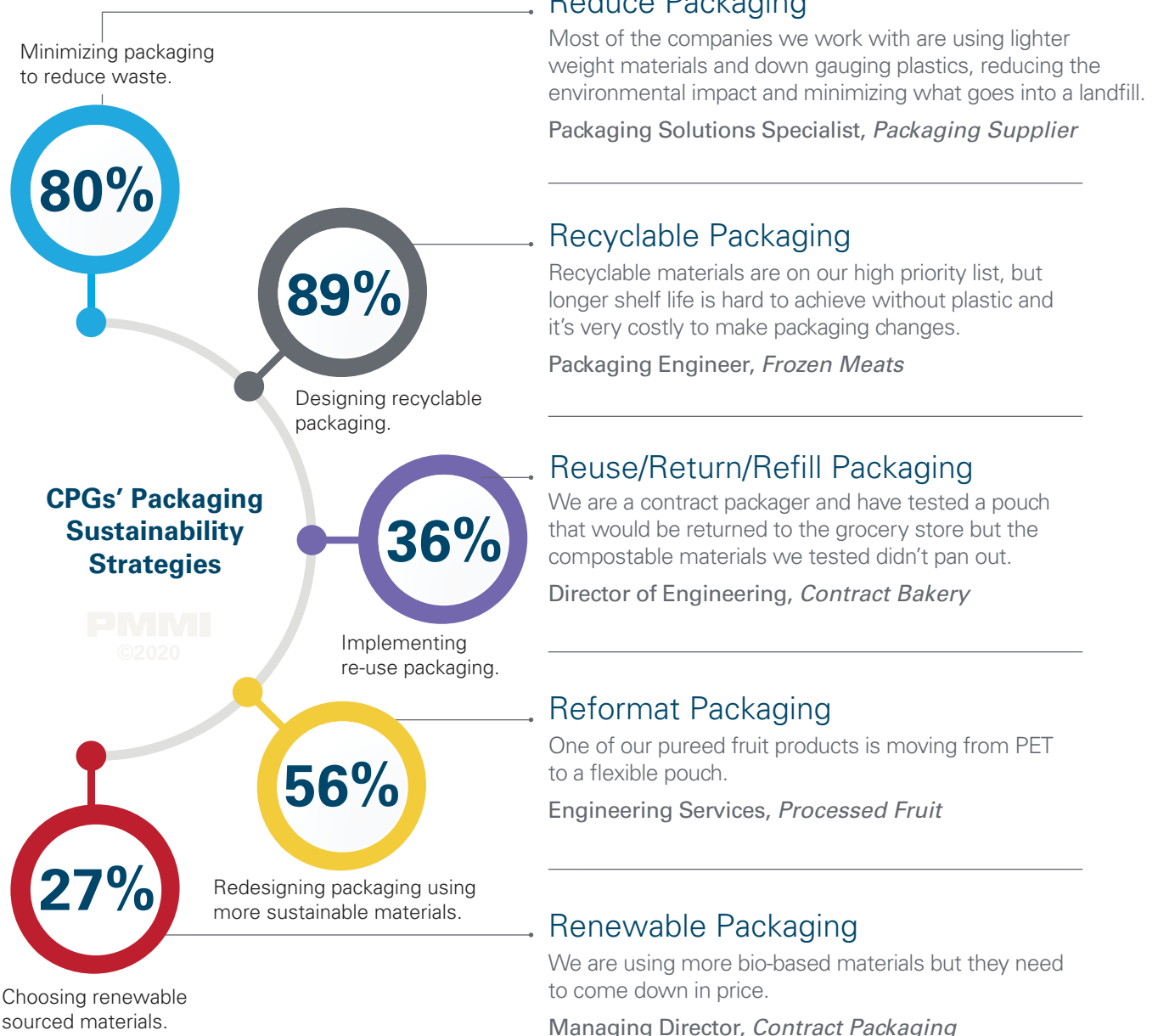


Brand Owners
Embrace and Actively
Pursue a **Sustainable
Packaging Story**

“
Everyone wants to be a good citizen and have good products, and it’s only a win-win if the overall costs are stable or lower in order to justify a sustainable solution.
Packaging Solutions Specialist, *Packaging Supplier*
”

► Companies generally want to achieve more environmentally friendly packaging solutions.

CPGs pursue the following:



The New Plastics Economy
Global Commitment
is led by the Ellen
MacArthur Foundation, in
Collaboration with the UN
Environment Program

“

We have pledged to reduce our use of virgin plastic packaging in all our packaged products and collect more packaging than we use by 2025, creating a circular economy for recycled plastic.

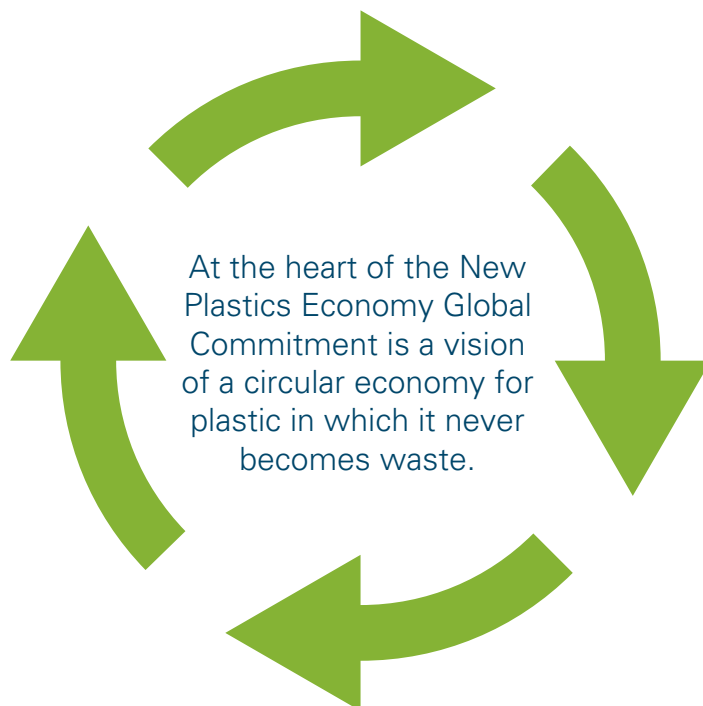
Sr. Engineering Manager,
Personal Care

”

▶ **One of the UN Sustainable Development Goals for Packaging:**
Work towards 100% reusable, recyclable, or compostable plastic packaging by 2025.



Over 450 partner companies, several of whom were interviewed for this report, have signed up to achieve a clear set of sustainability goals by 2025.



Member companies in the New Plastics Economy Global Commitment Foundation are working toward three actions to realize the sustainable vision:

- ① **Eliminate** all problematic and unnecessary plastic items.
- ② **Innovate** to ensure that the plastics we do need are reusable, recyclable, or compostable.
- ③ **Circulate** all the plastic items we use to keep them in the economy and out of the environment.

Measurable Goals

Participants agree to report on progress annually and be reviewed every eighteen months to ensure transparency and help drive momentum.



Consumers are Active Participants in Driving Packaging Sustainability and Ongoing Education Will Make a Smarter Shopper

▶ **One of the UN Sustainable Development Goals:** Commit to achieve the vision by collaborating with the private sector.

“

To promote our sustainable story for the next 12 months, we are focusing on reclaiming and recycling our current packaging, which would include the collection of used bottles, requiring retailer and consumer cooperation to achieve this goal.

Sr. Packaging Engineer, *Household Products*

”



52%

Of **CPGs** agree that consumers need to be better educated to understand sustainability and what it really means for packaging design and costs.

The next generation of consumers will demand less material in packaging and companies need to look at their entire sustainability equation.

Consumer Behavior:

- Check packaging labels for recycling information
- Read packaging labels for sustainable initiatives
- Actively seek out products in sustainable packaging
- Share the importance of sustainable packaging
- Pay more for products in sustainable packaging



59%

Of consumers say they would pay more for eco-friendly packaging.

Source: Survey, *GlobalWebindex*



Millennials are Sustainability Leaders

- Care most about general sustainability, as well as packaging sustainability, than any other age demographic.
- Are most concerned with recyclability, reducing product waste, and reducing packaging waste.
- Most likely to seek out sustainable options, primarily by checking packaging labels for information about recycling and/or sustainability.

CONSUMER POWER

“

Sustainability is consumer driven, but consumers don't fully understand what sustainability means or the costs associated with delivering it.

Managing Director,
Contract Packaging

”

Technology Can Teach the Consumer to Recycle

Smart technology, mobile devices, and the growth of the Internet of Things will enable printed electronics and other “smart” features to be included on packaging to communicate with consumers and educate them on where and how they can recycle packaging.

Growing Public Concern

93% of packaging professionals believe public concern over the environmental impact of plastic packaging will continue to grow.

2018 Survey; Packaging Digest and Sustainable Packaging Coalition

PLASTICS TAKING THE BLAME

“

There is a growing perception that plastics usage is evil and consumers have reacted to this negative publicity, which isn't always founded in facts.

VP Technology and Environment,
Expert

”



LEARN MORE IN THE FULL REPORT

Understand What Brand Owners Need as They Embrace and Build Their **Sustainable Story**

Machine Challenges

- **CPGs** share their machine issues when pursuing sustainable packaging and recommend functional improvements.
- **Primary packaging** lines are impacted when running new materials.
- **Secondary packaging** lines need greater precision machines to handle materials with variances in material content and weight.
- 2 in 5 CPGs interviewed predict **spending more** on machinery in the near future.
- CPGs are looking to **partner with suppliers** that can help them craft and implement a sustainability plan.

Material Innovation

- **Five considerations** to achieve sustainability goals.
- 4 in 5 CPGs are **reducing packaging** materials through redesign and innovative solutions.
- Nearly all CPGs are pursuing **recyclable materials** or higher PCR content.
- CPGs profile the next **innovative packaging material** that meets their sustainability goals.
- Over half of CPGs are evaluating or **implementing new materials** to be more sustainable.

Package Format Changes

- Over 1 in 3 CPGs are implementing **reuse, return, or refill** options.
- Over half of CPGs are switching or considering **new packaging formats** to improve recycling.
- Over half of CPGs are **reformatting products**, moving from one packaging format to another.
- Over 1 in 4 CPGs are exploring **renewable packaging**, such as testing plant-based and bio-based packaging options.
- Understanding the **single-use plastics** ban – what's the world going to do?





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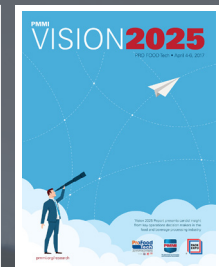
Cannabis Market



Aftermarket Opportunities For OEMs



Flexible Packaging Market Assessment



Vision 2025



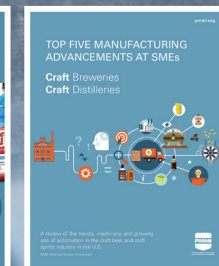
Robotics



Omnichannel Retail



Nutraceuticals Market Assessment



Craft Beer & Spirits