

GETTING STARTED WITH SUSTAINABLE PACKAGING

Considerations for Creating More
Environmentally Friendly Packaging



PACKAGING
WORLD®

PMMI MEDIA
GROUP

WHAT IS SUSTAINABLE PACKAGING?

The Sustainable Packaging Coalition (SPC) has set forth a list of criteria that relate to the activities of the packaging value chain and define the areas in which the organization actively seeks to encourage transformation, innovation, and optimization.

As defined by SPC, sustainable packaging:

- a.** Is beneficial, safe, and healthy for individuals and communities throughout its lifecycle
- b.** Meets market criteria for performance and cost
- c.** Is sourced, manufactured, transported, and recycled using renewable energy
- d.** Optimizes the use of renewable or recycled source materials
- e.** Is manufactured using clean production technologies and best practices
- f.** Is made from materials healthy throughout the lifecycle
- g.** Is physically designed to optimize materials and energy
- h.** Is effectively recovered and utilized in biological and/or industrial closed-loop cycles

Read SPC's full definition of sustainable packaging at: [pwgo.to/7063](https://www.pwgo.to/7063)

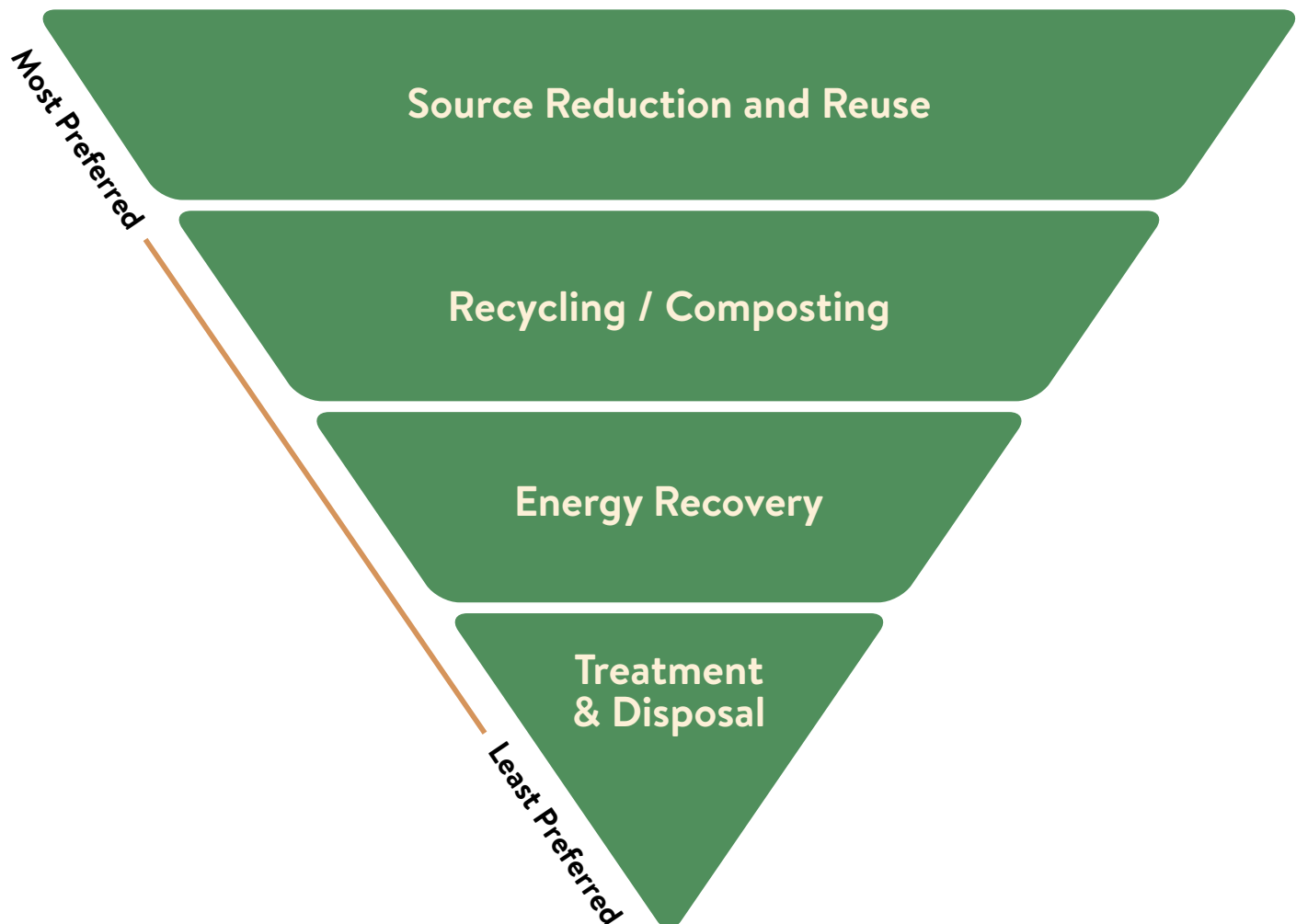
WHAT'S DRIVING THE NEED FOR SUSTAINABLE PACKAGING?

- Public perception of packaging as waste, in particular single-use plastics. In a 2020 report to World Wildlife Fund, "Public Opinions Surrounding Plastic Consumption and Waste Management of Consumer Packaging," 56% of respondents strongly agreed that "We need to change our economy from one that throws things away to one that emphasizes reuse and recycling," while 30% somewhat agreed. (See report at [pwgo.to/7064](https://www.pwgo.to/7064).)
- Proposed U.S. legislation, including recent bills introduced at the federal level related to packaging end-of-life management, including Extended Producer Responsibility schemes. (See "Four Packaging-Related Bills Making Their Way Through Congress," at [pwgo.to/7065](https://www.pwgo.to/7065).)
- Requirements for more eco-friendly packaging from large retailers, such as Amazon and Walmart. (Learn about Amazon's Sustainable Packaging Vendor Incentive Program at [pwgo.to/7066](https://www.pwgo.to/7066).)
- Global circular economy initiatives, including the Ellen MacArthur Foundation's New Plastics Economy Global Commitment, which includes more than 500 signatories across the global supply chain. (Learn more at [pwgo.to/7067](https://www.pwgo.to/7067).)

WHERE DO OPPORTUNITIES EXIST TO REDUCE THE ENVIRONMENTAL IMPACT OF PACKAGING?

According to the Environmental Protection Agency's Hierarchy for Non-Hazardous Materials and Waste Management, source reduction and reuse are the most preferred methods, followed by recycling and composting, after which is energy recovery. The least preferred methods include treatment and disposal of non-hazardous materials, such as their disposal in landfill. (Learn more at [pwgo.to/7068](https://www.epa.gov/pwgo/pwgo-to-7068).)

WASTE MANAGEMENT HIERARCHY



WAYS TO REDUCE PACKAGING MATERIALS

- Lightweighting of material; the elimination of secondary packaging, for example, using an extended-text label on a bottle rather than a carton; designing packaging to ship in its own container (SIOC, as required by Amazon); redesigning the product so that it requires less packaging.
- Optimizing packaging so that it uses the least amount of material, while still protecting the product. (Learn how stemware brand Lenox optimized its wine glass packaging for Amazon at pwgo.to/7069.)
- Using late-stage customization, printing on-demand, and box-making on-demand. (Learn how one e-tailer reduced its packaging with a fit-to-size auto-boxer at pwgo.to/7070.)

Be Aware: Never reduce packaging to the point where it compromises product protection. Given that, on average, packaging represents just 5% of a food product's carbon footprint, when product is wasted due to poor packaging, all the energy and resources that went into producing the product are lost.



MODELS FOR PACKAGING REUSE

According to a publication from the Ellen MacArthur Foundation, “Reuse – Rethinking Packaging,” there are four business-to-consumer reuse models, all of which have been proven in the field:

- **Refill at home:** Users refill their reusable container at home, with refills delivered through a subscription service. (Read how D2C company Truman’s created a functional package design for concentrated cleaning products at pwgo.to/7071.)
- **Refill on the go:** Users refill their reusable container away from home, for example, at an in-store dispensing system. (See how Algramo implemented a vending machine-style refill system for lower-income consumers in Chile at pwgo.to/7072.)
- **Return from home:** Packaging is picked up from the consumer’s home by a logistics service, such as UPS. (Learn about Loop’s circular shopping platform at pwgo.to/5599.)
- **Return on the go:** Users return the packaging at a store or drop-off point. (For example, Burger King is piloting reusable packaging at its restaurants: pwgo.to/7073.)

Considerations: Can your product be concentrated? Are there opportunities for product customization? How can you rethink the packaging so that it becomes part of the product? How does a reusable/refillable system provide value to consumer? What will be the supply chain for the product, especially if packaging needs to be returned for cleaning and refilling? How can your packaging be redesigned to be durable enough for multiple uses?

Download a copy of the Ellen MacArthur report, “Reuse – Rethinking Packaging,” here: ellenmacarthurfoundation.org/reuse-rethinking-packaging

DESIGN FOR RECYCLABILITY

- Whenever possible, design your packaging to be recycled. This includes primary packaging and all components, including ink, labels, closures, fitments, etc.
- Understand which materials are widely accepted for recycling at the Materials Recovery Facilities (MRFs) located in the areas where your packaging is distributed.
- Clearly communicate recycling instructions to consumers on-pack through schemes such as the standardized How2Recycle labeling system. (Learn more at how2recycle.info.)

Resources include: “The APR Design® Guide for Plastics Recyclability” (plasticsrecycling.org/apr-design-guide) and the “Design for Recycled Content Guide,” from the Sustainable Packaging Coalition (sustainablepackaging.org/projects/design-for-recycled-content-guide.)



COMPOSTING CONSIDERATIONS

- There are bio-based materials currently available that allow for compostability.
- Compostable materials may be more expensive and may have different functionalities than the petroleum-based plastics they replace.
- Composting is not widely available in the U.S.
- Compostable packaging makes the most sense for food applications, where the packaging can be disposed of along with food waste.
- To claim compostability in municipal and aerobic composting facilities, plastics and products made from plastics must meet ASTM 6400 specifications.

ENERGY RECOVERY / TREATMENT & DISPOSAL

Working toward a circular economy for plastics means designing packaging so that it can go back into the system, rather than being burned for energy or landfilled. Avoid packaging materials and designs that end up as waste.



WHAT MATERIAL SHOULD YOU CHOOSE?

Plastic, Rigid

- Polyethylene terephthalate (PET) is a highly functional material: it's lightweight, provides good barrier, is transparent, and is non-toxic. It can be used for a range of applications, most notably food and beverage.
- PET is the most collected plastic in the U.S. for recycling. Recycled PET can now be used in larger percentages, although the supply is limited. While 100% rPET can result in a cloudy appearance, consumers are becoming more accepting of these materials. In addition, Consumer Packaged Goods companies are investing in collection and recycling systems to ensure greater rPET purity. (Learn how Coca-Cola is transitioning to 100% rPET here: [pwgo.to/7074](https://www.pwgo.to/7074).)
- New drop-in bioplastics can be used to create packaging that has the same functionality as PET and polyethylene (PE), including recyclability. (Read how Boulder Clean incorporated 25% sugarcane-based plastics into its PE laundry detergent bottle: [pwgo.to/7075](https://www.pwgo.to/7075).)
- High-density polyethylene (HDPE) is recyclable, but is not as widely collected. HDPE packaging can also be produced with a high percentage of recycled materials, but again, the supply of rHDPE can be limited.
- Expanded polystyrene (EPS) has fallen out of favor, including being banned in some areas and by some retailers, but there are some plant-based renewable materials being used as alternatives.
- Until recently, recycled polypropylene was not approved for food-contact applications.
- New advanced recycling technologies are emerging that allow mixed-waste and difficult-to-recycle packaging materials to be recycled for a range of applications, including for food contact. (Learn more at [pwgo.to/7328](https://www.pwgo.to/7328).)
- A number of programs and initiatives are underway to collect ocean-bound plastics for use in packaging. (Learn how SC Johnson is using ocean plastic for its Mr Muscle and Windex brand packaging: [pwgo.to/7076](https://www.pwgo.to/7076).)





WHAT MATERIAL SHOULD YOU CHOOSE?

Plastic, Flexible

- Advantages: Lightweight, smaller footprint, easier to transport and store, functionality for a range of products, can use a variety of closure systems, styles. Full-body graphics. Can be used for a range of applications, including hot-fill, microwavable, retort, etc. Offers convenience in those environments/occasions where glass is not as convenient, handy for on-the-go.
- Drawbacks: Multilayer flexible packaging cannot be recycled through traditional mechanical recycling systems. However, polyethylene film can be recycled via store drop-off.
- A recent flood of innovation around monomaterial flexible films is allowing for barrier packaging that can be recycled through store drop-off systems. (Read how Mars Food developed a recyclable, microwavable rice pouch at pwgo.to/7077.)

Learn more about the sustainability benefits of flexible packaging from the Flexible Packaging Assn. (FPA) at www.flexpack.org/resources/sustainability-resources.

Bioplastics, for both rigid and flexible

- More expensive than petroleum-based plastics.
- Depending on the type of bioplastic, it may not have required functionality, such as barrier, heat resistance, etc.
- Can be combined with traditional, petroleum-based materials to reduce amount of fossil fuel-based plastic.
- Drop-in bioplastics make it possible for plastics to be recycled in traditional mechanical recycling streams, whereas some other bioplastics cannot be handled in these systems.
- Not all bioplastics are biodegradable.
- Bioplastics take advantage of widely available, renewable plant-based materials and byproducts.
- Using bioplastics may fit well with a brand's eco-friendly positioning.

A wealth of information on bioplastics for packaging is available from European Bioplastics at www.european-bioplastics.org.



WHAT MATERIAL SHOULD YOU CHOOSE?

Paper

- Often needs a polyethylene (PE) coating for barrier, for example, for frozen meal cartons, hot cups, etc., or a wax coating, in the case of corrugated cases used for packaging subjected to wet environments; these make the packaging non-recyclable. But there are new bio-based coating options available that allow for recycling. (Read about how one company is using a more sustainable option for a cooler product at pwgo.to/7078.)
- Packaging made from paper can contain up to 100% recycled material.
- Look for suppliers that offer Forest Stewardship Council- (FSI), Sustainable Forestry Initiative- (SFI), or PEFC-certified products to ensure they support and practice responsible forest management principles.
- Paper packaging is widely recycled; however the material is not infinitely recyclable.
- If special printing techniques, such as metallic inks or holographics, are used, it may render the packaging non-recyclable. However there are new technologies that address this as well. (Learn how Arctic Brands Group used holographic technology from Metsä Board on secondary packaging for its gin brand that ensured the carton's recyclability: pwgo.to/7079.)
- New technologies have been launched that are allowing for the use of paper for bottles, replacing plastic or glass packaging. (Watch this video to learn how paper bottles are gaining momentum for new liquid product rollouts: pwgo.to/7080.)
- Paper is being used in place of plastic ring carriers or cartons in both food and beverage applications. (Watch a video to learn about how they are being employed for food packaging: pwgo.to/7081.)
- Advancements in material technology are enabling confectionery products traditionally found in flexible plastic packaging to use paper, while running at full production speeds. (Learn how Nestlé achieved the "paperization" of its Smarties confectionery packaging at pwgo.to/7082.)

Learn more about sustainable paper packaging from The Paperboard Packaging Council: paperbox.org

WHAT MATERIAL SHOULD YOU CHOOSE?

Glass

- Advantages: It is infinitely recyclable, inert, no transfer of chemicals or organoleptics from packaging to product. Can be used by brands to convey clean, organic, premium attributes.
- Drawbacks: Colored glass can be difficult to recycle, glass packaging is heavy to transport, and glass takes up more space than flexible packaging during transport. Glass also requires much more energy than aluminum to recycle: 1051 KWh versus 504 kWh per 100 bottles per year.
- It is being used successfully in reusable packaging systems around the world, including the Loop circular shopping platform and in Germany, for its beer bottles.

More information on the benefits of glass can be found online from the Glass Packaging Institute, at www.gpi.org.

Metals, Aluminum

- Infinitely recyclable, without a loss in quality and purity, and widely recycled in the U.S.
- New options are available that enhance the functionality and aesthetics of cans, including new shapes and closures. (Read how a textured can for Mtn Dew Game Fuel is using a resealable closure: pwgo.to/7083.)
- Alternatives to Bisphenol A coatings are now available, ensuring the material health of the packaging.
- A range of markets, including personal care and wine, are adopting the use of aluminum cans to replace rigid plastic or glass packaging. (Watch a video to learn how some specialty personal care brands are shifting from plastic to aluminum at pwgo.to/7084.)
- Can be used in reusable packaging applications, due to its durability.

Learn more about how cans are used for sustainable food and beverage applications from the Can Manufacturers Institute: www.cancentral.com



WHICH PACKAGING MATERIAL IS THE MOST SUSTAINABLE?

When it comes to creating sustainable packaging, no one material is better than another. It depends on the application, where product is being sold (e.g., availability of disposal alternatives), how the product will be used, how the packaging will be transported, the availability of materials, economic feasibility, etc. Recognize that creating sustainable packaging requires a holistic, supply-chain point of view—from sourcing of raw materials through to end of life. There are tradeoffs with every material.

There are tools available that can evaluate the relative sustainability attributes of different materials for a packaging application. One is COMPASS (Comparative Packaging Assessment), a cloud-based streamlined lifecycle assessment (LCA) solution tailored for packaging design evaluations, from the Sustainable Packaging Coalition. Learn more here: sustainablepackaging.org/projects/compass



PARTNERSHIPS ARE CRUCIAL TO SUSTAINABLE PACKAGING SUCCESS

- Partner with suppliers to develop packaging that is the best fit for your application.
- Look at opportunities to be involved in organizations that promote and share innovation in sustainable packaging and work to promote recycling.

Groups include:

American Chemistry Council

www.americanchemistry.com/better-policy-regulation/plastics

AMERIPEN

www.ameripen.org

Bioplastic Feedstock Alliance

bioplasticfeedstockalliance.org

Closed Loop Partners

www.closedlooppartners.com

E-com Packaging Council (ECPC)

www.fuseneo.com/ecpc

Every Bottle Back

www.innovationnaturally.org/plastic

Global Plastics Alliance

www.marinelittersolutions.com

The National Association of PET Container Resources (NAPCOR)

napcor.com/

OSC2 (One Step Closer)

osc2.org

Plastic Bank

plasticbank.com

Recycling Leadership Council

consumerbrandsassociation.org/sustainability/recycling-leadership-council

The Association of Plastic Recyclers (APR)

plasticsrecycling.org

The Recycling Partnership

recyclingpartnership.org

Reusable Packaging Assn.

www.reusables.org

SoulBuffalo: Ocean Plastics Leadership Network

opl.n.org

The Sustainability Consortium

www.sustainabilityconsortium.org

Sustainable Packaging Coalition

sustainablepackaging.org

Additional Resources:

American Chemistry Council: Advanced Recycling

www.americanchemistry.com/better-policy-regulation/plastics/advanced-recycling

Ellen MacArthur Foundation: The New Plastics Economy: Rethinking the future of plastics & catalysing action

www.ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics-catalysing-action

Ellen MacArthur Foundation: Upstream Innovation: a guide to packaging solutions

www.ellenmacarthurfoundation.org/publications/upstream-innovation

Glossary: Advancing Circular Packaging

www.advancingcircularpackaging.com/recycling-resources-and-tools/glossary

PMMI Sustainability Report: Packaging Sustainability: A Changing Landscape

www.pmmi.org/report/packaging-sustainability-changing-landscape

Sustainability in Packaging: A Glossary of Terms

www.amcor.com/sustainability/glossary

Sustainability Glossary

www.berryglobal.com/sustainability/glossary

Walmart Sustainable Packaging Playbook

s4rbimagestore.blob.core.windows.net/images/rightnow/walmartsustainability.custhelp.com/for_answers/packagingplaybook.pdf

BECOME A PACKAGING WORLD INSIDER

Packaging World keeps professionals across all industries informed about the business of packaging. Our magazine, email newsletters, and news hub offer a smart mix of new products, technology innovations, and sustainability updates.

Keep a pulse on packaging news!
Discover what your peers are talking about with our exclusive resources:

Packaging World magazine

our monthly magazine covering everything
from emerging brands to industry titans

Packaging Insights

our weekly newsletter for bleeding-edge news and trends

Shelf Impact

our bi-monthly newsletter for best-in-business
package designs and developments

Packworld.com

our free 24/7/365 news, event, and resource hub

JOIN YOUR PEERS TODAY!

To become an insider, check out the following resources:

[Packaging World magazine](#)
[Packaging World newsletters](#)
[Packaging World event updates](#)

**PACKAGING
WORLD®**

