



Definition of Sustainable Packaging

5 Principles of Sustainable Packaging

RESOURCE



PACKAGING
DESIGN

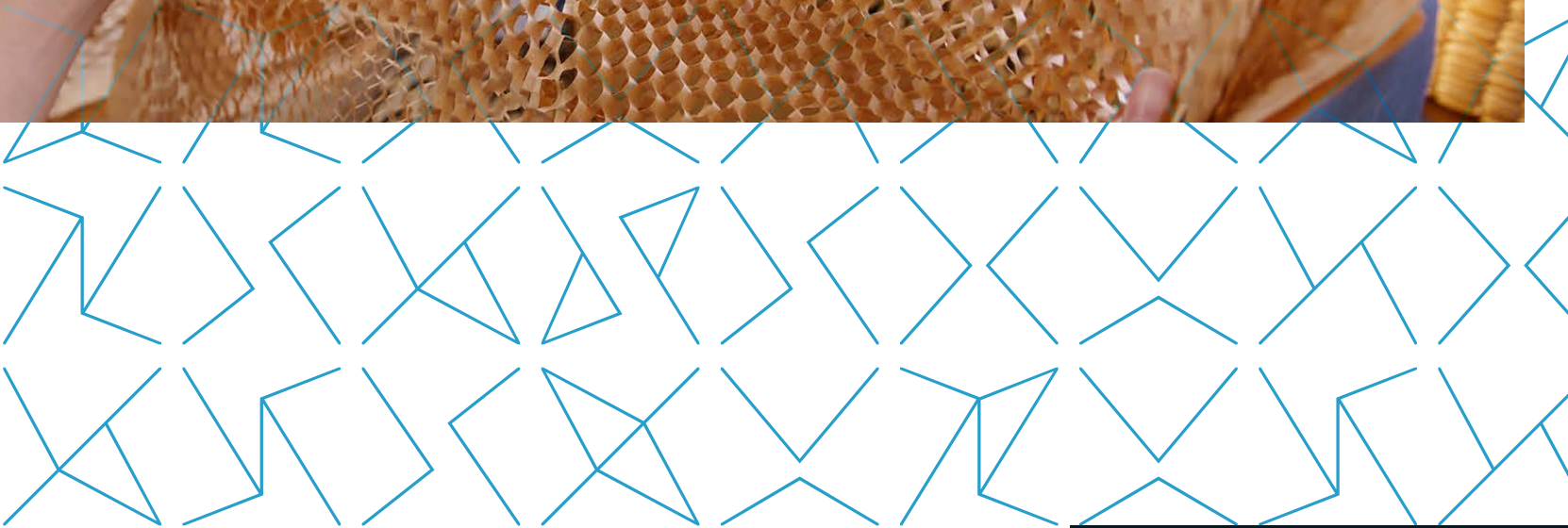
GreenBlue is an environmental nonprofit dedicated to the sustainable use of materials in society. We bring together a diversity of stakeholders to encourage innovation and best practices to promote the creation of a more sustainable materials economy.

The Sustainable Packaging Coalition (SPC) is a membership-based collaborative that believes in the power of industry to make packaging more sustainable. We are the leading voice on sustainable packaging and we are passionate about the creation of packaging that is good for people + the environment. Our mission is to bring packaging sustainability stakeholders together to catalyze actionable improvements to packaging systems and lend an authoritative voice on issues related to packaging sustainability. The Sustainable Packaging Coalition is a trademark project of GreenBlue Org.



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5 PRINCIPLES OF SUSTAINABLE PACKAGING

The Sustainable Packaging Coalition considers sustainable packaging to be an approach to the design, production, and distribution of packaged goods. This approach is guided by comprehensive principles that consider the impacts of sourcing, manufacturing, and disposing of materials for packaging - that is, the entire life cycle of the package.

Packaging refers to materials or containers used around a product to help identify and differentiate, transport and distribute, store, promote, and use the product properly. It is important to note that sustainability for packaging is first and foremost an approach, rather than a descriptor of a specific package material or format. There is no such thing as a perpetually “sustainable package” - sustainability depends on tradeoffs in the materials, format, and design of a package.



The following five principles are designed to help the packaging value chain approach sustainable packaging through a comprehensive, systems-wide lens, minimizing the negative environmental and social impacts of the product-package system while maximizing the performance and purpose of packaging.

Sustainable packaging is more than just recyclability - companies should use a holistic approach that follows the EPA's Waste Hierarchy, prioritizing better design through reduction and reuse over better disposability.

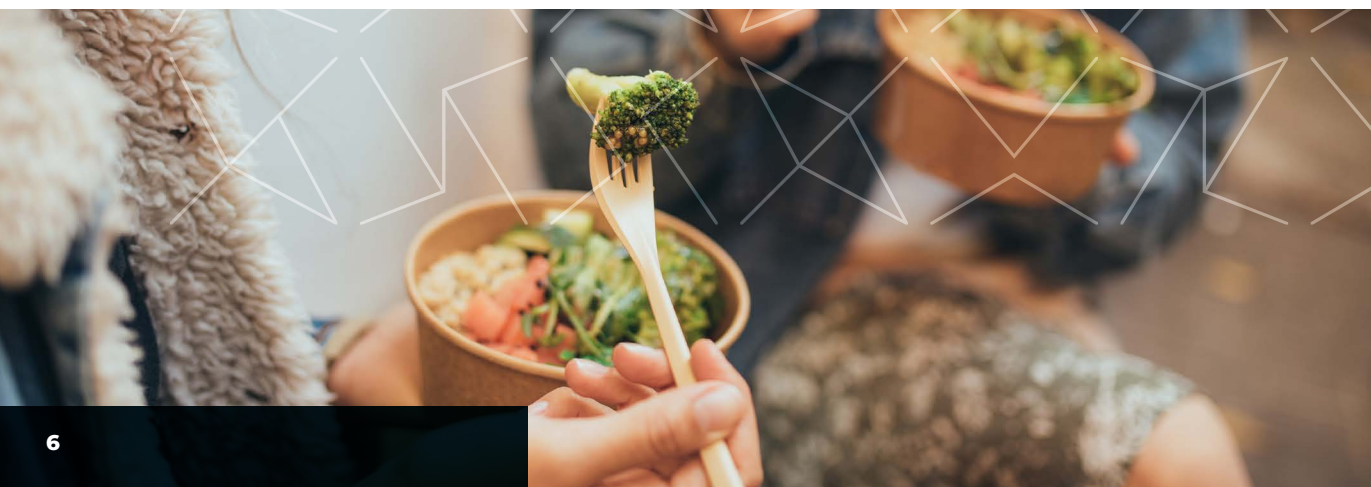
Specifically, moving towards **sustainable packaging** will require designers and engineers to incorporate as many of the five principles as possible, and continuously improve and innovate to accomplish more of the principles.

Sustainable packaging is packaging that:

1. Uses SMART¹ design
2. Advances the use of recycled materials and/or sustainably-sourced, renewable feedstocks
3. Is designed for reusability, recyclability, or compostability and labeled with appropriate end-of-life instructions

Companies working on sustainable packaging should also work on ensuring that their product-package system:

4. Engages with reuse and refill models
5. Invests in the growth of recycling and composting infrastructure, collection, and access



1. Sustainable Packaging Coalition, 2023

1. Uses SMART Design



Sustainable packaging uses **SMART** design to reduce the negative environmental and social impacts that can occur across the entire life cycle of a package. **SMART** stands for:

- S** Systems approach
- M** Material health
- A** Accessibility
- R** Reduction and elimination
- T** Life-cycle thinking

A **systems approach to packaging** is needed to avoid unintended consequences of design choices. This means considering the environmental footprint of the product itself, with the aim of protecting the product or packaging contents. When a product is damaged or spoiled before it can be used, all of the energy and materials used to produce the product are also wasted. Using a package to prevent the spoilage of perishable products like food or resource-intensive items like electronics ensures that the impacts associated with the product itself are not going to waste, even if there is increased packaging.

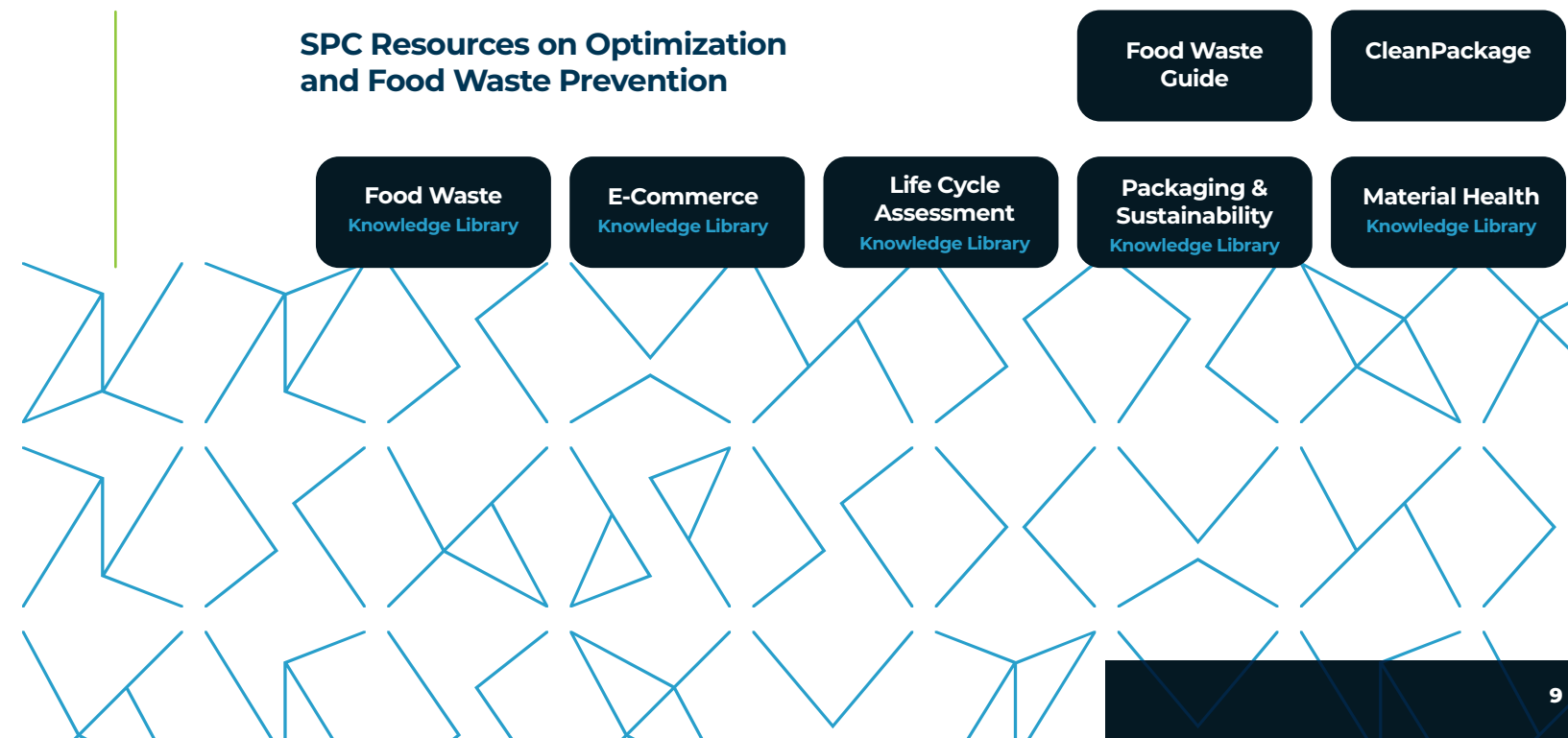
The concept of **material health** - also known as the “safe, then circular” approach to packaging materials - should serve as a guide so that hazardous chemicals are not introduced into recycling and composting streams. Hazardous chemicals should not be used to manufacture a package, since this can have environmental health consequences for workers, communities near production facilities, and consumers. This often requires the packaging value chain to go beyond compliance with chemical safety regulations and perform additional due diligence. Safety must be a priority for each component of the packaging system, including both the primary base material and all additives, adhesives, coatings, and decorative elements.

Sustainable design for packaging considers not just environmental impacts but also social implications. The concept of **appropriate accessibility** refers to packaging that is easy to use and open for all individuals, including those with disabilities, limited mobility, and the aging population, who may experience reduced dexterity, vision, or cognitive abilities. At the same time, certain packaging needs to include seals, child locks, or tamper evidence to limit access to the contents. Strategies to incorporate accessibility into a package may include sensory cues, braille labeling, and easy- to-open mechanisms. Sustainable packaging design should strive to ensure that all individuals can independently and safely access product contents.

Sustainable packaging seeks to **reduce** the amount or number of materials it uses. Over-packaging, or using more packaging than is required to reasonably protect a product, results in the unnecessary use of materials and energy. Optimization involves an assessment of the amount of packaging being used to determine if it can be redesigned, or eliminated. Right-sizing, lightweighting, and other design strategies help to ensure efficient distribution and use. For example, using the packaging to prevent damage in transit to the customer can reduce the overall environmental impacts by preventing an item from needing replacement.

Finally, sustainable packaging is developed using **life-cycle thinking** - this means considering all aspects of the life cycle of a package, including material sourcing and extraction, manufacture, distribution, use by a consumer, and disposal. This approach helps companies to think holistically about the impacts of their packaging and identify areas for improvement. In many cases, the biggest environmental impact from packaging is not during disposal, but rather in the sourcing and manufacturing phases.

SPC Resources on Optimization and Food Waste Prevention



2. Advances the use of recycled materials and/or sustainably-sourced, renewable feedstocks



Sustainable packaging aims to minimize the environmental and social impacts from sourcing and manufacturing packaging materials. This involves responsible sourcing practices, which include strategies such as using recycled materials or sustainably-sourced, renewable feedstocks.

For most applications, packaging is not sustainable if its production requires depleting or relying on finite resources such as fossil fuels or metals. Instead, using recycled materials can reduce the amount of energy required to produce a package while also reducing the reliance on resource extraction. Using recycled materials also builds important end markets for recyclable packaging, creating market drivers for circularity.

For some materials or formats, it is not possible to source recycled materials. In these cases, sustainable packaging can also use renewable feedstocks such as sustainably-sourced wood and non-wood fiber or biobased plastics. Using these materials can help to reduce reliance on non-renewable resources such as fossil fuels.

When sourcing responsibly, companies should understand the landscape where the material is being sourced and any unintended consequences, and work to mitigate potential environmental damage or health impacts, such as the release of air pollutants or hazardous waste. Third-party certifications and auditing programs can help companies protect against environmental and social issues in their supply chain while maintaining or improving the well-being of workers and communities.

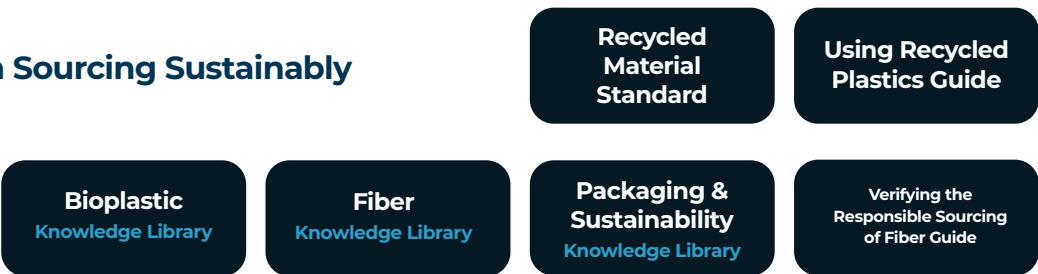
Sustainable packaging aims to minimize the **environmental and social impacts** from sourcing and manufacturing packaging materials.



Biobased plastics are wholly or partly derived from plants (e.g. corn, wood, sugar cane) or animals (e.g. fish scales and insect exoskeletons). These feedstocks are renewable resources, meaning that they can be regenerated and harvested again with sustainable harvesting methods. Biobased materials can be used for packaging applications where either recyclability or compostability is being pursued.

For all material types, facilities that produce packaging materials should prioritize low-emissions energy from solar, wind, biobased, hydroelectric, or geothermal energy production. Companies sourcing from manufacturing facilities should verify that local communities are not harmed by hazardous waste or emissions from both virgin and recycled material production.

SPC Resources on Sourcing Sustainably



3. Is designed and labeled for reusability, recyclability, or compostability



Well-designed sustainable packaging is not destined for landfills or incineration: rather, it is designed for recovery through reuse, recycling, or composting in a circular economy. The circular economy is an important opportunity for companies to invest in both the future of the planet and their own supply chains. By designing packaging to be recovered or reused at the end of its first life, companies may lower procurement costs (in the case of reuse), ensuring the availability of future recycled material (in the case of recycling), and supporting regenerative practices and soil health (in the case of composting).

In order to design for recyclability or compostability, companies should refer to industry guidelines (e.g. [APR's Design Guide](#) for plastics, [AF&PA](#) for paper, [How2Recycle Guide](#)), applicable reprocessing and repulpability testing standards for paper-based packaging (let from Western Michigan University), and third-party certifications from certifying organizations (for example, BPI, CMA, or TUV for compostability). Standards and certifications can help processing facilities have greater confidence in the material they are receiving.

Sustainable packaging in business-to-consumer applications is clearly labeled so that consumers know which end-of-life stream it has been designed for and belongs to. Labeling packaging with end-of-life instructions gives consumers transparency into the fate of a package. It can also prevent inaccurate or misleading marketing claims, which frustrate consumers and deteriorate trust in brands' environmental efforts.

Labeling programs such as How2Recycle educate consumers about a package's components and give clear instructions for how to prepare materials for recycling. Certifications for compostable packaging help ensure it will become valuable finished compost and will not negatively impact soil quality. The distinction between recycling and composting a package should be clearly described to reduce cross-contamination between these two streams. Standardized labeling schemes for reusable packaging are still emerging but should be used when they become available.

packaging is being reused, refilled, and/or returned multiple times. The lower the return rate, the greater the environmental impact of the reusable package. Sustainable packaging that is reusable or refillable should be part of a system that facilitates high return or refill rates in practice, rather than simply being designed to be durable.

When designing reusable packaging, companies should design the reuse offering with equity in mind, by considering the barriers to adoption as a result of any higher upfront costs, deposits, or a requirement to use technology such as mobile phones or apps. Companies

should also work to scale the availability of their reusable offering across all socioeconomic levels.

Reusable and refillable packaging will require investments in collection, washing, and refill infrastructure to create efficiencies in the reverse logistics. The packaging value chain should also work towards harmonization of reusable packaging formats, so that many brands across a product category can use a standardized format to lower costs, pool collection, and increase convenience for consumers. Success with these efforts will require collaboration and alignment across companies and their supply chains.

SPC Resources on Reusability, Recyclability, and Compostability

Reusable Packaging Guide

How2Recycle

How2Compost

Reusable Packaging Knowledge Library

Reusable Packaging Collaborative

How to know if your paper packaging is recyclable guide

SPC Resources on Reuse & Refill

Reusable Packaging Guide

Reusable Packaging Position Statement

Reusable Packaging Knowledge Library

Reusable Packaging Collaborative

4.

Engages with reuse and refill models



Sustainable packaging engages with reuse and refill models such as return on the go, return from home, refill on the go, and refill from home. These models keep packaging materials in use for longer and lower the environmental impacts of a package-product system.

If optimized correctly, the environmental benefits of reusable packaging typically include the reduction of single-use packaging waste, lower carbon footprint, energy savings, and less waste entering material streams. Reusable packaging is durable and can be an end market for recycled materials, closing the loop for materials and facilitating the circular economy.

Crucial to reusable packaging's environmental benefit is a high return and refill rate (calculated as the number of reusable packages returned after use, divided by the total reusable packages distributed). Return rates that are greater than 80% help ensure that

5.

Invests in the growth of recycling and composting infrastructure, collection, and access



Companies working on sustainable packaging should also work on ensuring that their product-package system supports the growth of sortation and reprocessing infrastructure, such as recycling and composting facilities. This means working to expand residential and commercial access to programs that accept a variety of packaging materials, and to help motivate and educate consumers to participate in these collection programs. Effective infrastructure, widespread program access, and consumer participation are critical to ensuring that packaging is recovered.

Existing recovery infrastructure has challenges with successfully sorting and capturing value from lightweight, multimaterial, or complex packages. As a result, residential recycling and composting programs are often limited in scope or the materials they are able to process. To tackle these challenges, the packaging value chain must work with the recycling and composting industries to understand their pain points, appropriately design packaging for end-of-life, invest in new sortation technologies, and support policies that aid the growth of mechanical and chemical recycling infrastructure.

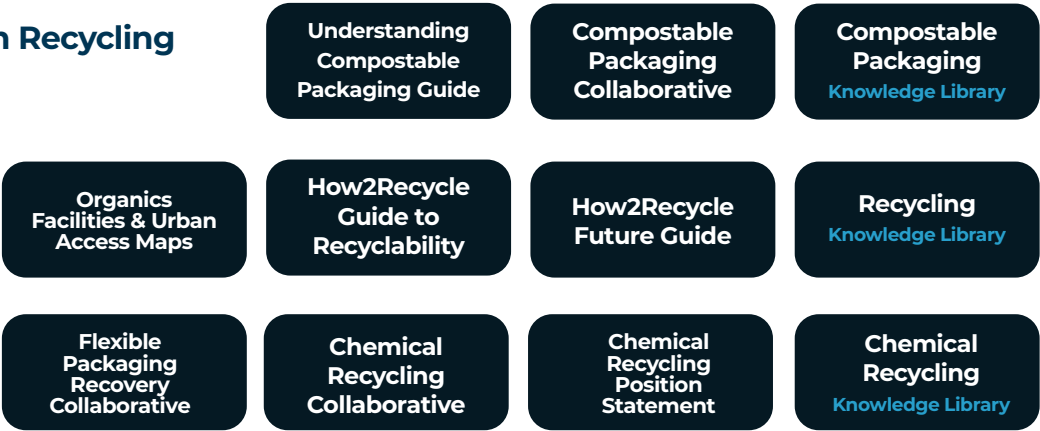


On a global scale, sustainable packaging will require investment in collection and infrastructure in countries that do not have curbside collection programs or processing facilities. Much of the current global waste management system relies on waste pickers and others informally employed in the recovery sector. Investing in the programs that meet the needs of the individual waste pickers is just as important as investing in advanced sorting technologies for developed economies.

Effective Extended Producer Responsibility (EPR) programs will generate much needed financial resources from the private sector into recovery infrastructure. The contributions (or payments)

made by the producers (typically brands, licensees, importers, and/or distributors) in an EPR program can be applied towards a variety of recovery efforts. This can include enhanced sortation at material recovery facilities (MRFs), processing equipment at composting facilities, or reuse and refill infrastructure such as washing and pooling services, all of which lead to increased recovery, supported infrastructure, and more sustainable packaging systems. Beyond recovery of materials, social and economic equality should be addressed in EPR programs. This can be through requiring diverse positions on an advisory board or socially just management through funds or education programs.

SPC Resources on Recycling & Composting



With the packaging value chain continuously improving upon the **five principles of sustainable packaging**, the industry will be contributing towards the goal of a circular economy.



RESOURCES

Use the following resources to learn about best practices and engage in industry collaboration.

- [Understanding Compostable Packaging Guide](#)
- [Compostable Packaging Collaborative](#)
- [Organics Facilities Map](#) + [Urban Access Tableau Data](#)
- [How2Recycle Guide to Recyclability](#)
- [How2Recycle Future Guide](#)
- [Flexible Packaging Recovery Collaborative](#)
- [Chemical Recycling Collaborative](#)
- [Chemical Recycling Position Statement](#)
- [Reusable Packaging Guide](#)
- [Reusable Packaging Collaborative](#)
- [Reusable Packaging Position Statement](#)
- [How to Know if Your Paper Packaging is Recyclable Guide](#)
- [How2Recycle](#)
- [How2Compost](#)
- [Recycled Material Standard \(RMS\)](#)
- [Using Recycled Plastics Guide](#)
- [Verifying the Responsible Sourcing of Fiber guide](#)

KNOWLEDGE LIBRARY TOPICS

The topics available in our knowledge library for a deeper dive into concepts around sustainable packaging.

- [Recycling](#)
- [Compostable Packaging](#)
- [Chemical Recycling](#)
- [Reuse](#)
- [Bioplastic](#)
- [Packaging and Sustainability](#)



Projects of GreenBlue

