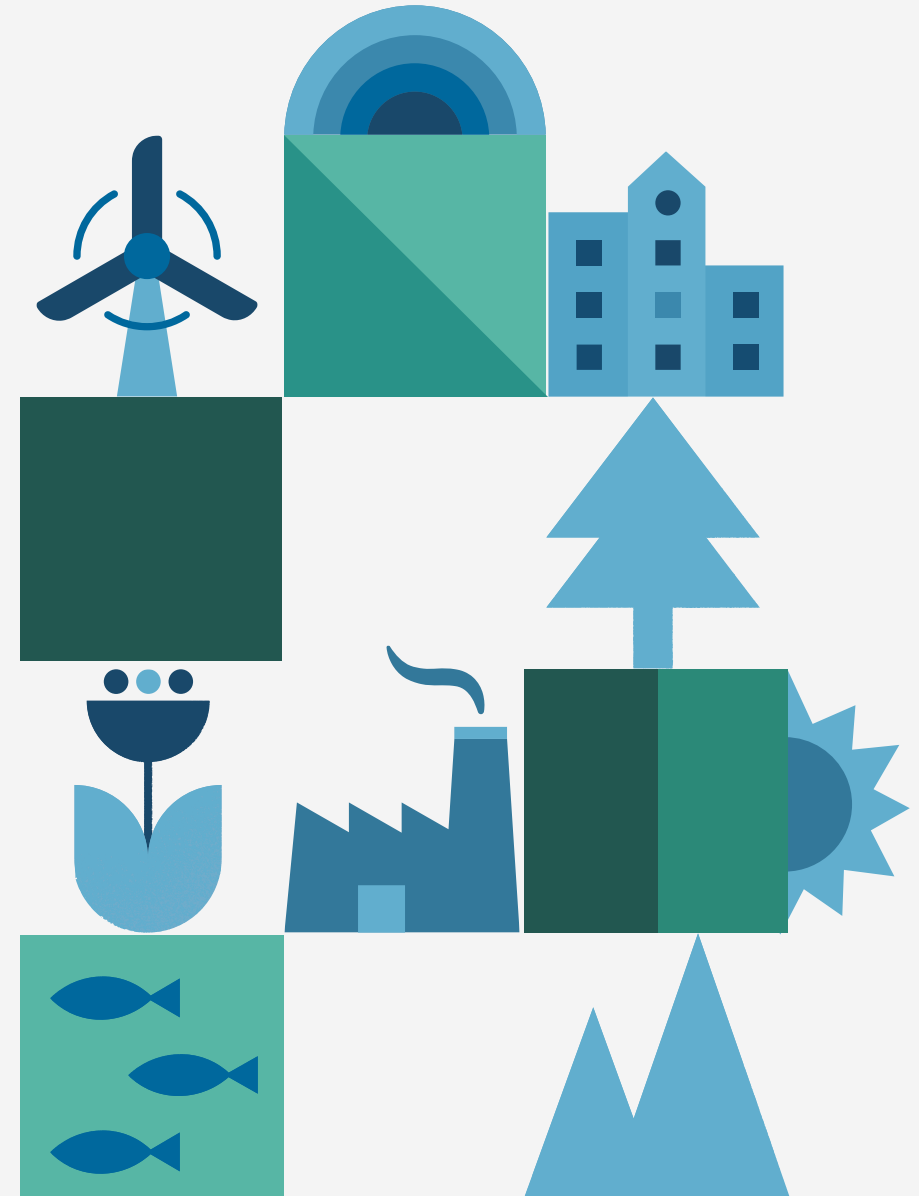


# The Dynamic Landscape of Sustainability:

Introduction to Sustainability and How it Relates to Condiment Packaging



# Presentation outline

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**01**

Introduction to  
Sustainability

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**02**

Sustainable  
Design

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**03**

Corporate  
Sustainability

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**04**

Legislative  
Trends that  
impacting  
Packaging

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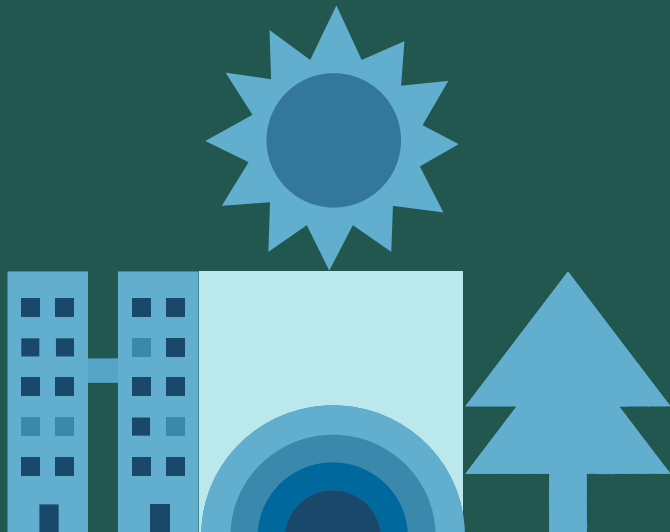
**05**

Food Safety  
and  
Sustainability

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**06**

Conclusions



# What is sustainability?



## Meeting the needs....

Of the present population **without compromising** the needs of future generation's ability to meet their needs



## Using renewable resources...

**No faster than** at the rate in which they regenerate



## Using the planet's natural resources...

**Without** destroying nature in the process.



## Minimizing pollution and waste...

To allow natural systems to **absorb, recycle, or render** them harmless



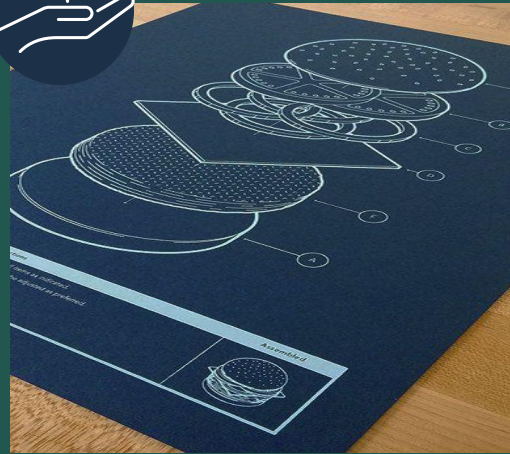
# How does sustainability intersect packaging?



## Materials and resources

Using materials that have a lower environmental impact

- Recycled content



## Packaging design

Design with the end in mind

- Design for recyclability



## Spoilage minimization

Minimizing food waste has a big environmental footprint



## Corporate emissions

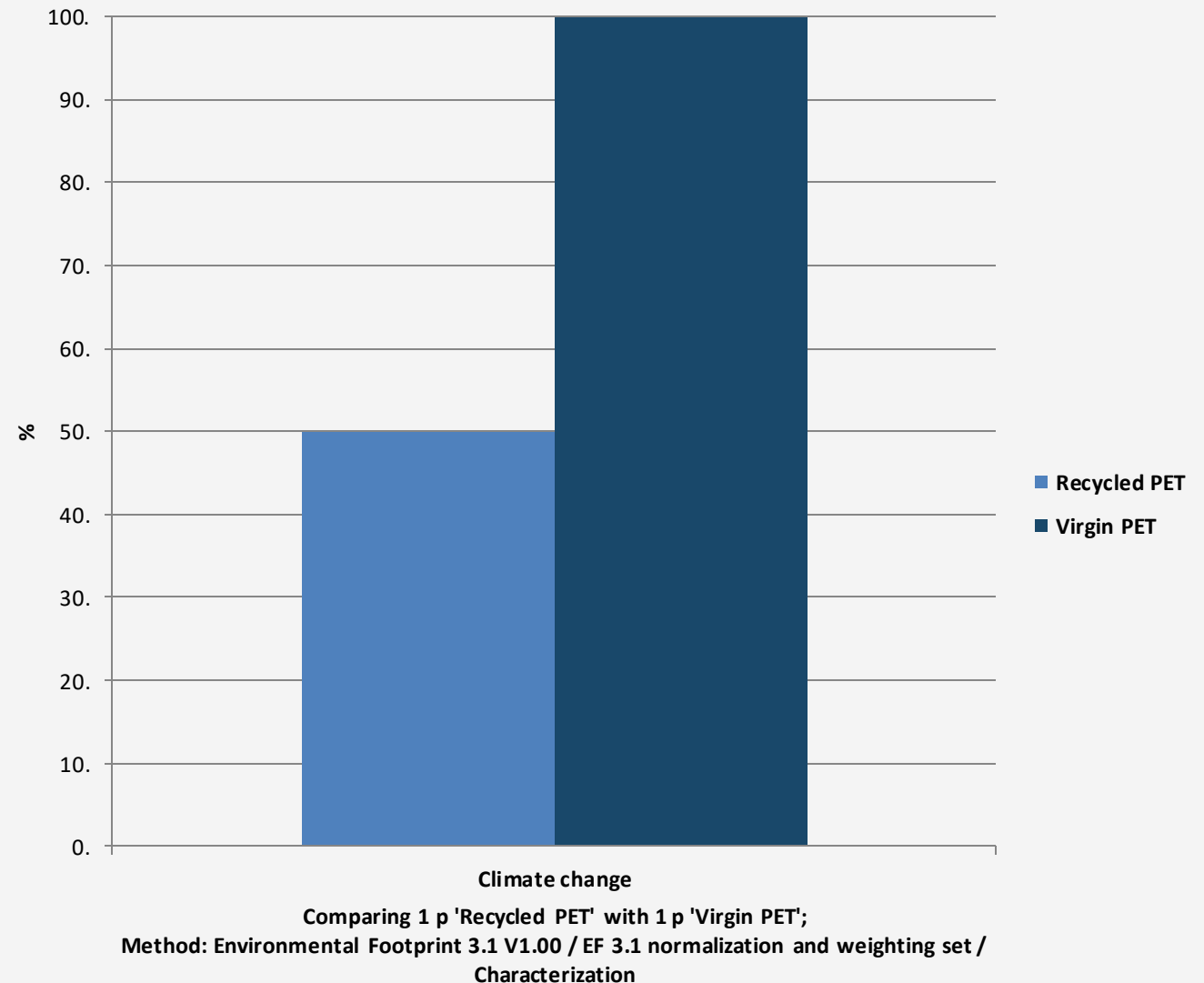
Reducing the environmental impact of production

- Focusing on scope emissions reduction

# Front-end design considerations: recycled content

Adding recycled content to packaging, can lower the carbon footprint of the package significantly

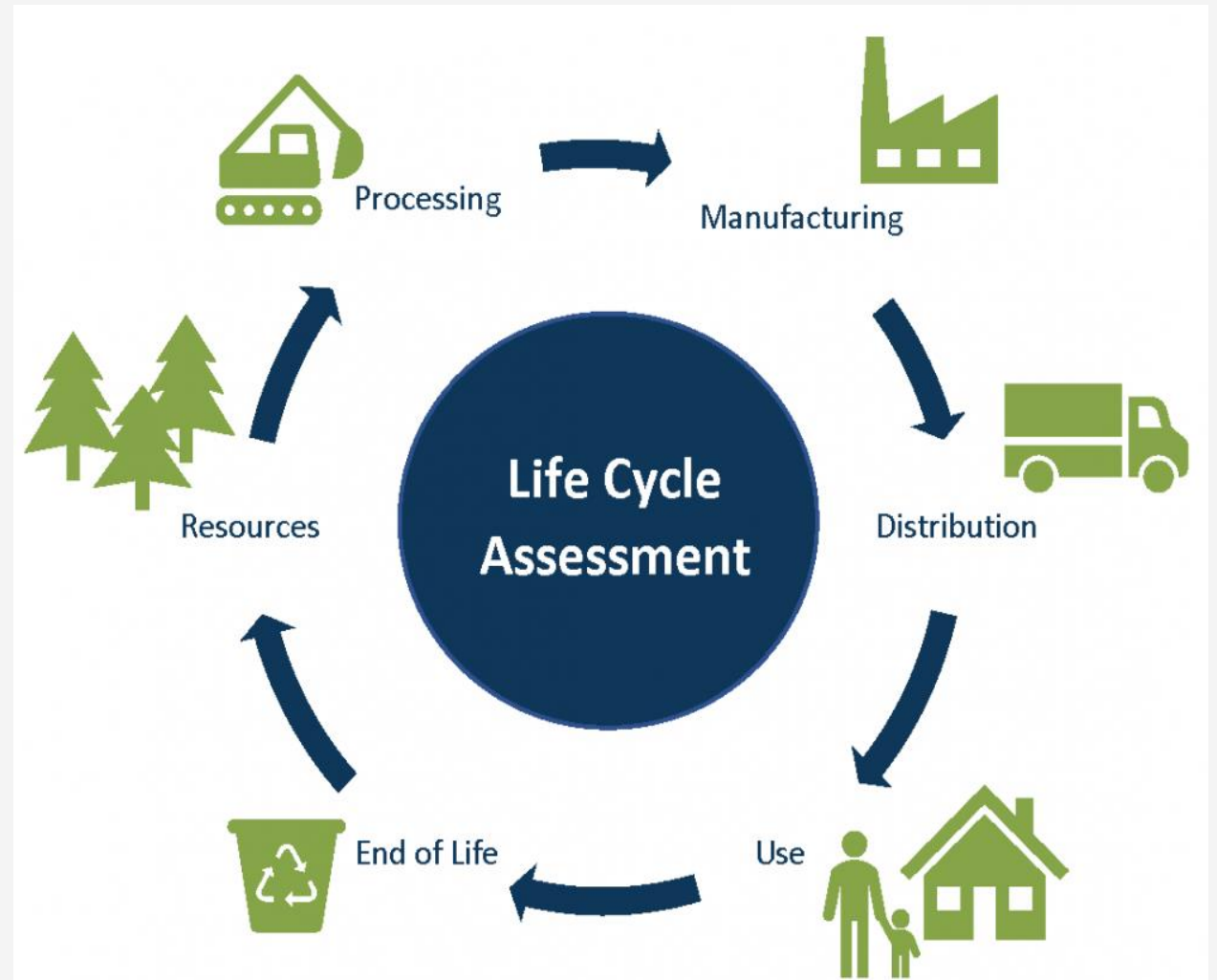
The graph on the right shows the relative impact in CO<sub>2</sub> eq. of virgin and recycled PET. Recycled PET has about a 49% lower carbon impact.



# Front-end design considerations: light-weighting

Most packaging life cycle assessments find that the life cycle stage with the highest environmental impact is **raw material production**.

This means that reducing the amount of material used in the package can have a significant impact on lowering environmental impact.



# Design for Recyclability

There are several industry guides for recyclable packaging design. The Association of Plastics Recyclers has put out the APR guidelines for plastic packaging design. To be considered recyclable...

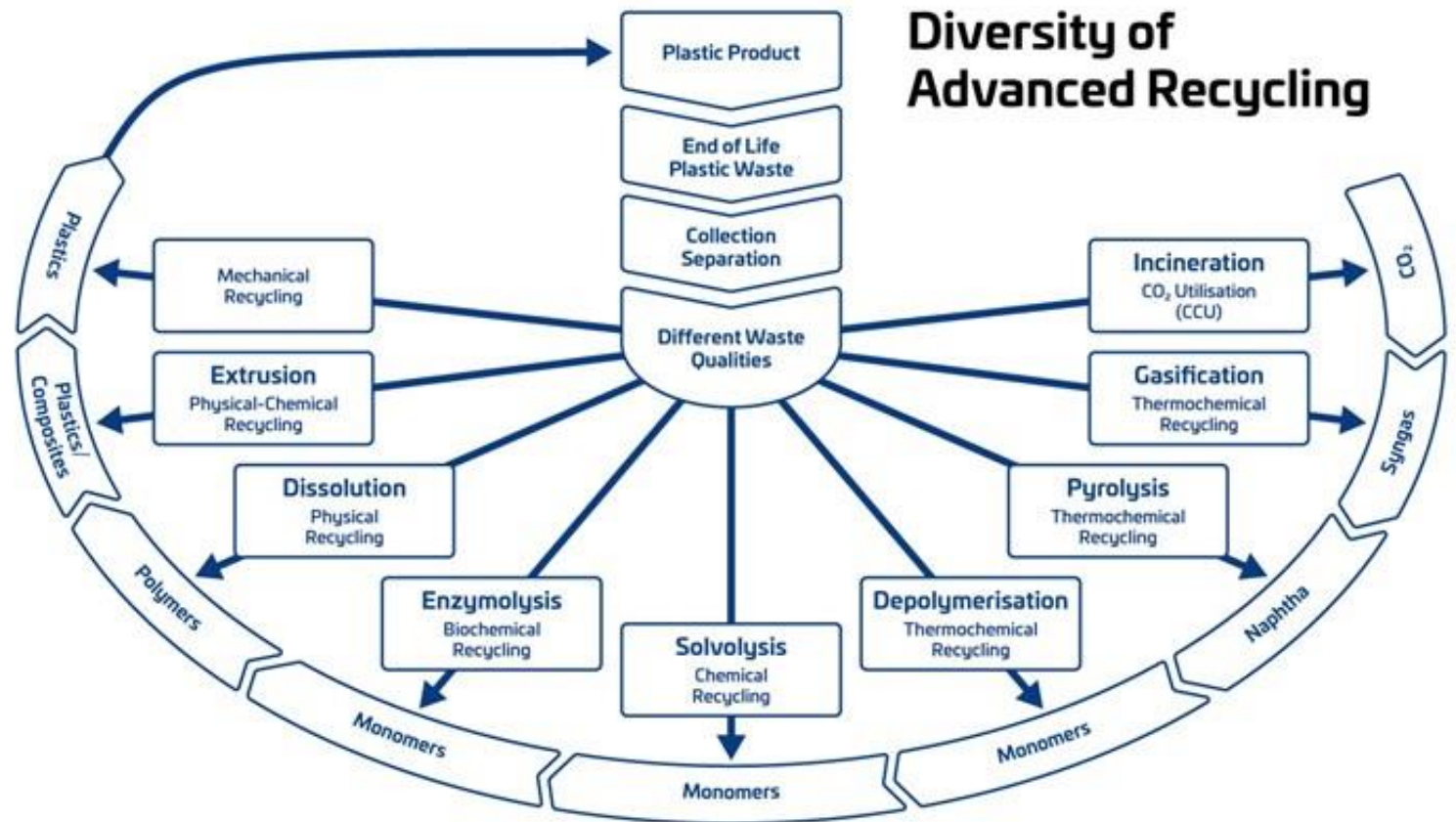
- At least 60% of consumers or communities have access to a collection system that accepts the item per the U.S. Federal Trade Commission "Green Guides"
- The item must have market value, or be supported by a legislatively mandated program.
- The item is most likely sorted correctly into a market-ready bale of a particular plastic meeting industry standard specifications
- The item can be further processed through a typical recycling process cost effectively into a postconsumer plastic feedstock suitable for use in identifiable new products.



# What about mixed plastics that can't be recycled?

Chemical recycling, also called advanced recycling, is a complementary recycling option to mechanical recycling. Unlike mechanical recycling, which involves melting and reprocessing plastic waste, advanced recycling uses chemical processes to break down plastic waste into its basic molecular components, which can then be used to produce new plastics, fuels, or other valuable products

There are many technologies that fall under the advanced recycling umbrella



# Advantages and challenges of advanced recycling

## Advantages

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It can process a wider range of plastic waste compared to mechanical recycling, including mixed plastics, contaminated plastics, and plastic waste that has been previously considered non-recyclable

Advanced recycling technologies can also recover more of the energy content of plastic waste

Additionally, advanced recycling can help reduce greenhouse gas emissions and divert plastic waste from landfills and incineration.

## Disadvantages

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High capital costs, technical complexities, and regulatory considerations.

There are concerns related to the environmental impact, energy requirements, and scalability of these technologies, as well as the need for proper waste management practices.

Ensuring that they do not compromise existing mechanical recycling efforts or waste reduction strategies.

Sustainable Packaging  
is not all about material  
choice, recycled  
content, or the ability to  
be recycled



Greenhouse gases resulting from rotted and otherwise wasted food accounts for around **half of all global food system emissions**, according to a new study.



In 2017, global food waste resulted in 9.3bn tonnes of CO<sub>2</sub>-equivalent (GtCO<sub>2</sub>e) emissions – roughly the same as the total combined emissions of the US and the EU that same year.



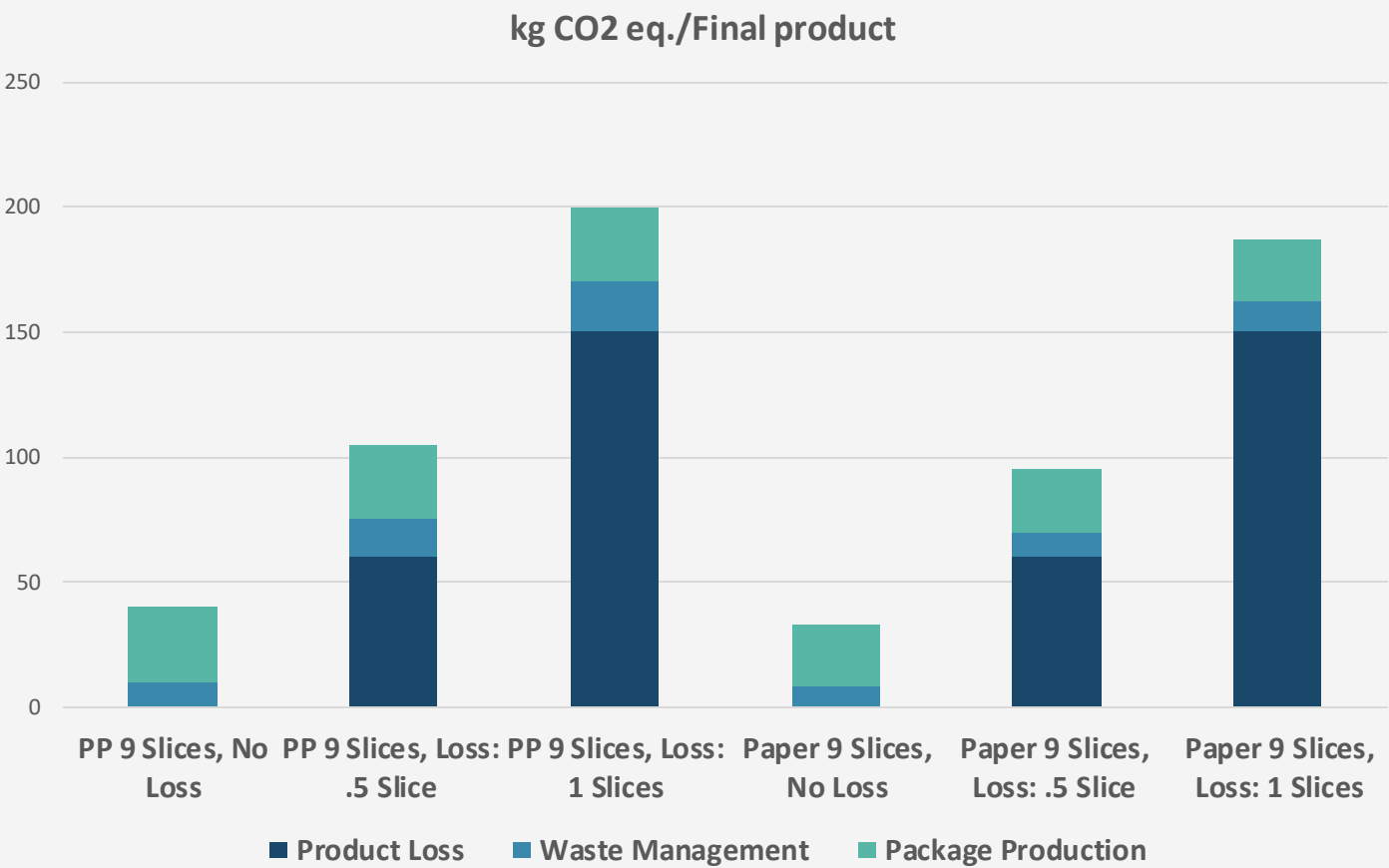
Ensuring that the food that is packaged reaches the end consumer, preventing food waste/spoilage is a critical piece of creating sustainable packaging



# Food Waste and Packaging

“The production chain of the wasted food was usually a more significant source of environmental impacts than the packaging production chain.” Silvenius et. al 2011

Losing half a slice of bread is more than doubles the impact of the production of packing itself.



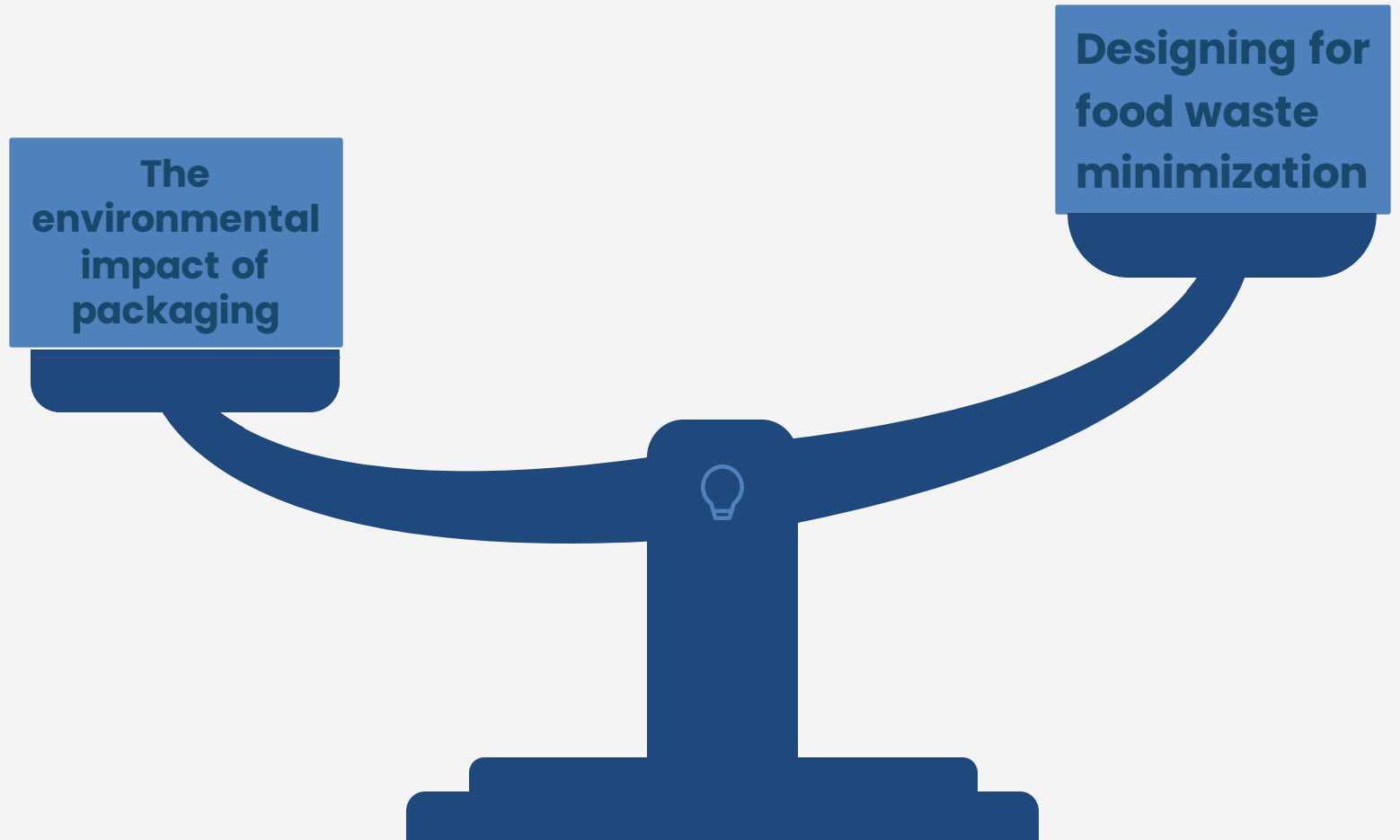
The share of package production, production chain of product loss and waste management of the carbon footprint of dark bread packaging system, other parts of production chain of bread excluded. The waste management method considered is the current state with energy recovery waste management Silvenius et. al 2011

# Sustainable design is a balancing act

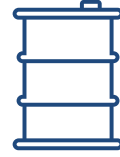
Designing for food waste reduction can lead to more packaging material being used, which is often less sustainable.

More material should not be used unless the environmental impact of the food is high.

There are many competing forces in sustainable packaging design. There is no “one size fits all solution



# Scope Emissions- Corporate Sustainability



## Scope 1

Scope 1 covers emissions from sources that an organization owns or controls directly – for example from burning fuel in our fleet of vehicles (if they're not electrically-powered).



## Scope 2

Scope 2 are emissions that a company causes indirectly when the energy it purchases and uses is produced. For example, for our electric fleet vehicles the emissions from the generation of the electricity they're powered by would fall into this category



## Scope 3

Scope 3 encompasses emissions that are not produced by the company itself, and not the result of activities from assets owned or controlled by them, but by those that it's indirectly responsible for, up and down its value chain. Scope 3 emissions include all sources not within the scope 1 and 2 boundaries

# Legislative packaging targets



## Extended Producer Responsibility

Policy approach that holds producers responsible for the entire life cycle of their products. Under this approach, producers are responsible for the safe and environmentally sound disposal or recycling of their products, and are required to cover the costs of such activities.



## Recycled Content Regulations

These are laws that establish a mandatory minimum amount of recycled content that is required in products. It may distinguish between post consumer recycled content and post-industrial recycled content.

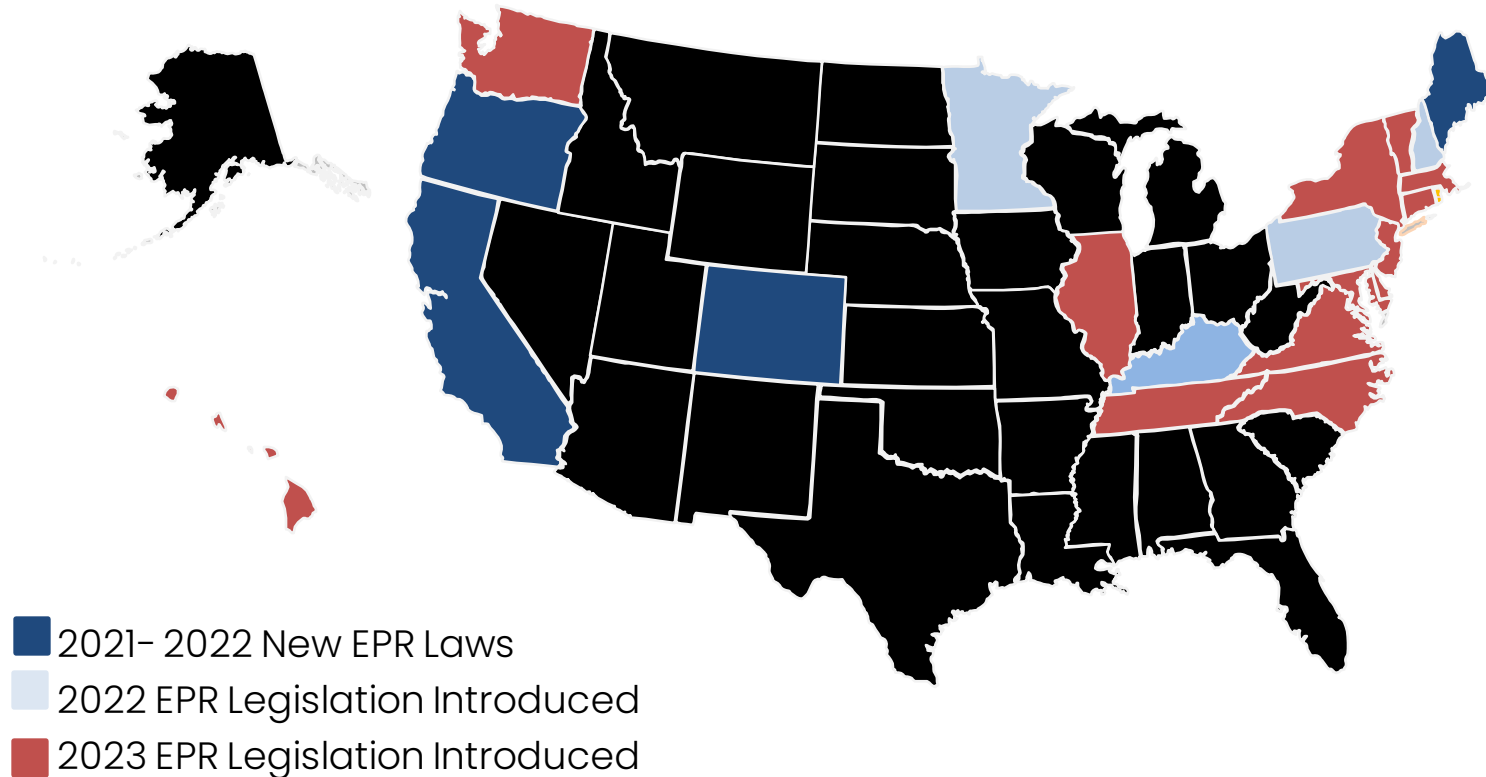


## Federal Activity

There are several bills at the federal level that would impact packaging companies. They try to establish everything from recycled content mandates imposing a tax on virgin plastics

# Extended Producer Responsibility

## Current Packaging EPR Activity in the US



Extended Producer Responsibility has continued to grow, recently reaching the US with bills passed in Maine, Oregon, and Colorado.

- **Maine**-Affects specifically “condiment packaging”
- **Oregon**-Affects specifically “condiment packaging”
- **Colorado**-Affects “plastic packaging”
- **California**-packaging intended to provide the user or consumer the individual serving or unit of the product and most closely containing the product, food, or beverage.

### So who is responsible?:

“Producer” means a person who manufactures a product that uses covered material and who owns or is the licensee of the brand or trademark under which the product is used in a commercial enterprise, sold, offered for sale, or distributed in the state.

Recycled content legislation is mostly focused on beverage containers. Some include rigid paper containers



There are six stand-alone bills across four states on recycled content

- California
- Maine
- New Jersey
- Washington



This has been a larger issue now that EPR bills have proposed performance goals

An example would be collection and recycling targets: Specific targets for the collection and recycling of products covered under the EPR scheme



Continued industry effort to advocate against PCR content “rates and dates mandates” codified in EPR proposals and laws

# Federal legislative activity

All the bills mentioned on this slide have been introduced in the house/senate. They are all in committee under review.

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## **Break Free for Plastics Act (HR 5845)**

Expansive proposal with packaging producer responsibility, single use plastic bans, recycled content mandates, mandatory recycling and composability labelling, national bottle bills. Establishes limitations on the export of plastic waste to other countries.  
Targeted to phase out single use plastics.

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## **Reduce Act (S. 2645)**

Proposes tax on products that use virgin plastic to manufacture single use plastic products. Fees would go towards plastic waste reduction and recycling activities. This is not currently part of the Build Back Better Act.

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## **Ocean Based Climate Solutions Act (HR3764)**

Proposal aims to provide for ocean-based climate solutions to reduce carbon emissions and global warming and to provide a plethora of positive effects for coastal and oceanic communities and habitats.  
Includes a proposal to impose a virgin plastic excise tax of .05 per lb.

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## **CLEAN Future Act (HR 1512)**

Includes proposals that would enforce EPA and Labeling requirements.  
Far-reaching plastics restrictions.

# The U.S. Plastics Pact

The U.S. Plastics Pact is a collaborative initiative aimed at creating a circular economy for plastics in the United States.

The U.S. Plastics Pact is part of the global Plastics Pact network, which is coordinated by the Ellen MacArthur Foundation and aims to drive systemic change towards a circular economy for plastics worldwide.

Goals and Commitments: The U.S. Plastics Pact has set ambitious goals to address plastic waste and pollution, including targets to:

1. Define and implement common standards for packaging design, use, and recycling by 2025.
2. Achieve a 50% recycling rate for plastic packaging by 2030.
3. Ensure that 100% of plastic packaging is reusable, recyclable, or compostable by 2025.
4. Take action to reduce the unnecessary use of plastic packaging and single-use plastics.

Some of the notable brands that have joined the U.S. Plastics Pact include:

- 1.The Coca-Cola Company
- 2.PepsiCo
- 3.Procter & Gamble
- 4.Keurig Dr Pepper
- 5.Nestle USA
- 6.Danone North America
- 7.Unilever
- 8.Mars, Inc.
- 9.Johnson & Johnson Consumer Health
- 10.Target Corporation

# The U.S. Plastics Pact's Problematic and Unnecessary Materials List

“Problematic or unnecessary” is defined as plastic packaging items, components, or materials where **consumption could be avoided through elimination, reuse or replacement** and items that, post-consumption, commonly do not enter the recycling and/or composting systems, or where they do, are **detrimental to the recycling or composting system** due to their format, composition, or size.

U.S. Pact Activators will take measures to eliminate these items by 2025:

- Cutlery\*
- Intentionally added<sup>1</sup> Per- and Polyfluoroalkyl Substances (PFAS)<sup>2</sup>
- Non-Detectable Pigments such as Carbon Black
- Opaque or Pigmented PET – Polyethylene Terephthalate bottles (any color other than transparent blue or green)
- Oxo-Degradable Additives, including oxo-biodegradable additives
- PETG – Polyethylene Terephthalate Glycol in rigid packaging
- Problematic Label Constructions – This includes adhesives, inks, materials (e.g., PETG, PVC, PLA, paper). Avoid formats/materials/features that render a package detrimental or non-recyclable per the APR Design® Guide. Labels should meet APR Preferred Guidance for coverage and compatibility and be tested in any areas where this is unclear.
- PS – Polystyrene, including EPS (Expanded Polystyrene)
- PVC – Polyvinyl Chloride, including PVDC (Polyvinylidene Chloride)
- Stirrers\*
- Straws\*

# Safety: Another dimension of sustainability

Including recycled content in packaging can be a great way to reduce environmental impacts however there are several concerns

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**Contamination** Recycled plastic may contain residues from its previous use, such as food residues, cleaning agents, or other contaminants. These residues may pose a risk of contaminating the food or beverage products that come into contact with the recycled plastic packaging, potentially leading to food safety concerns

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**Quality and performance** The quality and performance of food grade recycled plastic may vary depending on the quality of the input materials, the recycling process used, and other factors. Recycled plastic may have different properties compared to virgin plastic, such as reduced strength, increased brittleness, or reduced clarity, which may affect the performance and functionality of the final food packaging.

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**Consumer perception** Consumer perception and acceptance of food grade recycled plastic may also be a concern. FDA considers each recycled proposal on a case-by-case basis to ensure the recycling process is expected to produce a product that is of suitable purity for food contact applications.

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# PFAS–polyfluoroalkyl substances

PFAS– refers to 1000s of different chemicals that are widely used in many industrial processes. They are known for unique properties such as resistance to heat, water, and oil.

PFAS are highly persistent in the environment and do not break down easily, which has led to widespread contamination of air, water, and soil in many parts of the world. They are associated with various health effects, including liver damage/

## Where can they be found?

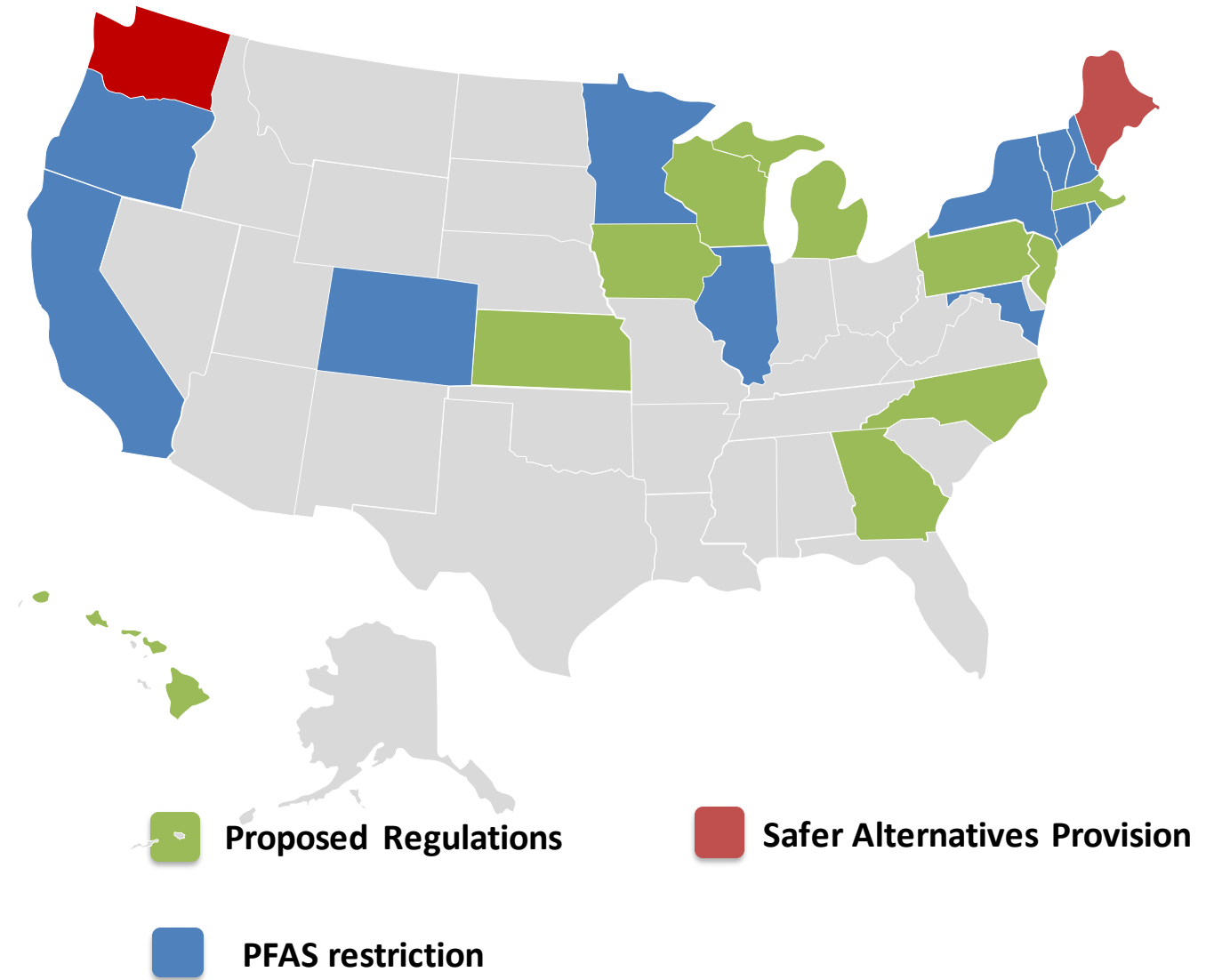
- Beverage containers
- Coated paper products
- Food packaging
- Pizza Boxes
- Non stick coatings



# PFAS-Legislation

Most PFAS restrictions focus on “intentionally added PFAS” rather than a zero PFAS reading.

However, Hawaii, New York, and Oregon have proposed or passed legislation to outright ban PFAS in paper and “all packaging types”



# Conclusion

Designing sustainable packing requires consideration of all aspects of the triple bottom line, “People, planet, profit”

Sustainability is a balancing act between many competing alternatives and needs

There is no “one size fits all” solution and there is always a tradeoff



	Packaging Type	Intentionally Added
Maine – 32 M.S.R.A 26-A.1733 and LD1503 – Enacted January 1, 2022	All Packaging Types	intentionally introduced in any amount greater than an incidental presence
New York S 8817 and 37-0901 Enacted December 31, 2022	Paper Only	chemical in a product that serves an intended function in the product component
California – AB1200 Enacted January 1, 2023	Paper Only	PFAS that are intentionally added to a product and that have a functional or technical effect in the product; or 2) more than 100 ppm of PFAS substances as measured in total organic fluorine.
Vermont – S20 Enacted July 1, 2023	All Packaging Types	addition of a chemical in a product that serves an intended function in the product component. May not be in any amount
Connecticut – Public Act No. 21-191 Enacted December 31, 2023	All Packaging Types	intentionally introduced in any amount during manufacturing or distribution
Colorado – HB22-1345 Enacted January 1, 2024	Paper Only	PFAS chemicals intentionally added to a product and that have a functional or technical effect on the product.
Minnesota – SF20 Enacted January 1, 2024	All Packaging Types	“PFAS deliberately added during the manufacture of a product where the continued presence of PFAS is desired in the final package or packaging component to perform a specific function.”
Washington – RCW 70A.222.070 Enacted January 1, 2022*	Paper Only	intentionally added in any amount
Hawaii – SB504 Dec 31, 2024 and January 1, 2027	Paper Only and All Packaging Types	...any food packaging, that contains perfluoroalkyl and polyfluoroalkyl substances
Oregon – SB543 January 1, 2025	All Packaging Types	Prohibits person from selling or distributing foodware containers containing perfluoroalkyl or polyfluoroalkyl substances
Illinois – SB0088 January 1, 2025	All Packaging Types	products that do not contain intentionally added PFAS chemicals