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# 2025 ANNUAL MEETING

March 16-18 | Omni Amelia Island Resort, FL

# Sustainable Packaging and Regulations

Best practices and guidelines to implement a true circular economy model

# Sustainability is Driving Pasta Industry Growth

- Products with environmental, social, and sustainable packaging claims are growing faster than those without

**National Pasta Association**
907 followers
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Sustainability is Driving Pasta Industry Growth

As consumer priorities shift, sustainability-related claims are shaping the future of food:

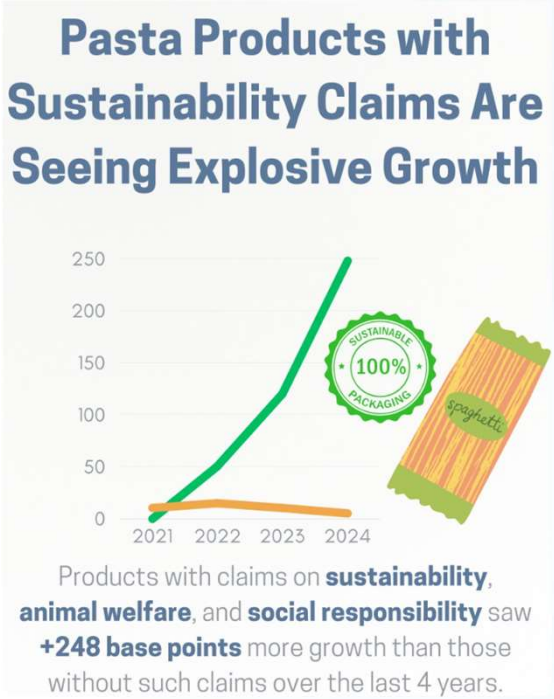
→ Products with environmental, social, and sustainable packaging claims are growing faster than those without
→ Brands with >50% of sales from sustainability-related products see repeat rates of up to 34%
→ Gen Z is leading the charge in "Better For™" purchases, prioritizing health, the planet, and ethical sourcing

This data comes from the latest industry insights—an exclusive benefit for NPA members.

Join NPA today to stay ahead of the curve and access other valuable reports.

Email us at info@ilovepasta.org to learn about membership and get the full report!

#PastaIndustry #ConsumerTrends #HomeCooking #FoodTrends #PastaLovers

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# Packaging Sustainability Intro


RICCIARELLI
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# To preserve and to valorize by pursuing sustainability

Sustainability: challenge and opportunity

Innovation is culture

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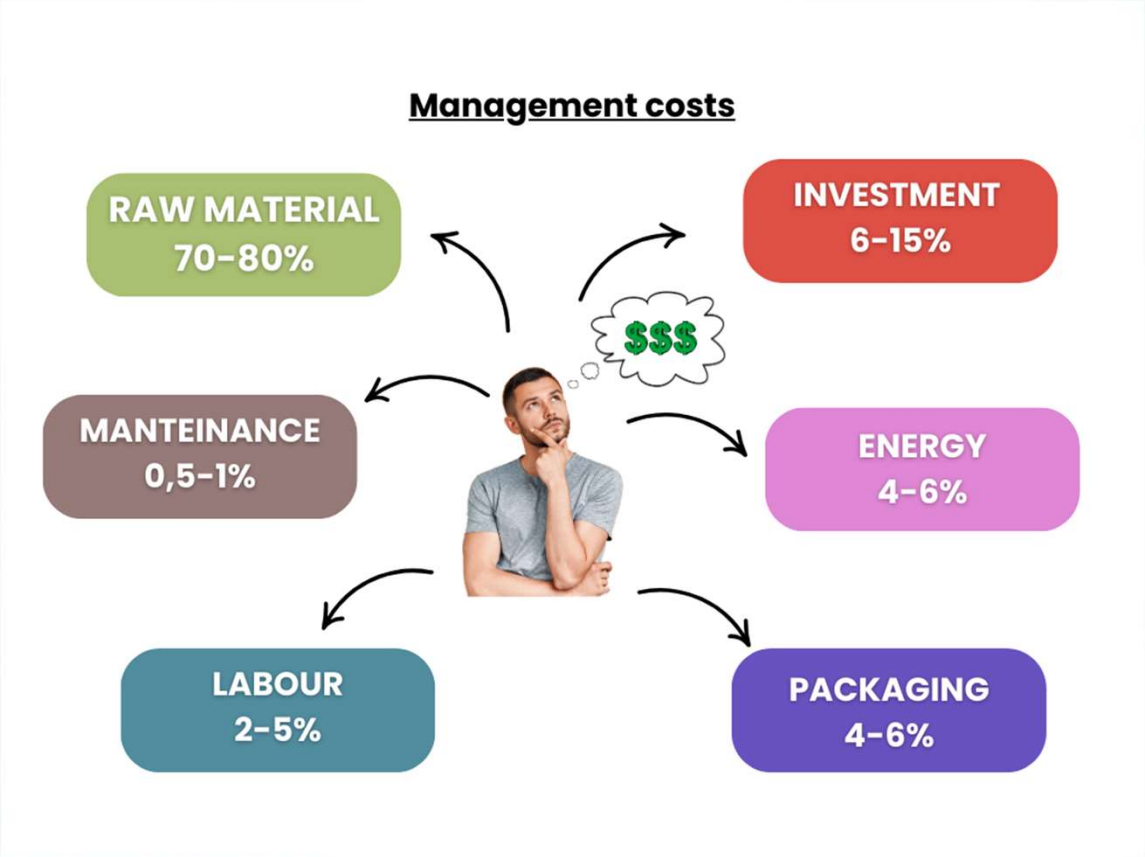
# Economic and environmental sustainability

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# World pasta consumption

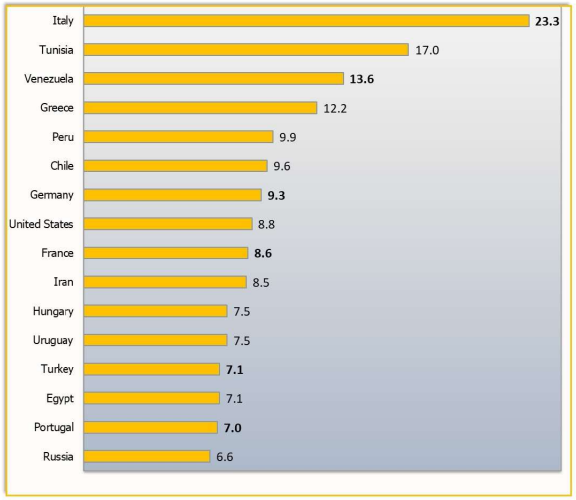
## World pasta consumption (tonnes)

| | | | |
|---|---|---|---|
| United States | 2,700,000 | Poland | **160,000** |
| Italy | **1,745,520** | Spain | 149,410 |
| Brazil | **1,090,459** | Greece | 130,300 |
| Russia | 961,474 | Haiti | 100,000 |
| Germany | **791,298** | South Africa | 91,000 |
| Egypt | 720,000 | Netherlands | 83,265 |
| Nigeria | 700,000 | Sweden | 73,697 |
| Turkey | **630,766** | Portugal | **72,500** |
| France | **569,851** | Austria | 72,459 |
| Venezuela | 375,875 | Ecuador | 69,804 |
| Iran | 360,000 | Romamia | 68,531 |
| Peru | 322,425 | Hungary | 68,490 |
| Argentina | 263,024 | Czech Republic | **66,855** |
| Mexico | 237,269 | Guatemala | 48,131 |
| Colombia | 230,984 | Croatia | 30,216 |
| United Kingdom | 227,279 | Belgium | 20,048 |
| Canada | 216,000 | Costa Rica | 18,014 |
| Chile | 186,693 | Slovenia | 10,672 |
| Tunisia | 185,000 | Cina | 9,531 |

*Source: Survey carried out by IPO – Oct. 2024*

*The countries that responded to the survey are shown in bold*

## *World pasta consumption (kg per capita)*




*Source: Survey carried out by IPO – Oct. 2024*

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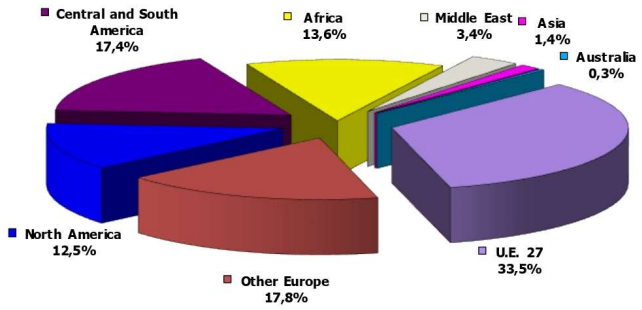
# World pasta production




## World pasta production

| | | | |
|---|---|---|---|
| Italy | **3,962,075** | Canada | 136,000 |
| United States * | 2,000,000 | Colombia | 118,647 |
| Turkey | **1,971,000** | India | 100,000 |
| Egypt | 1,200,000 | South Africa | 91,000 |
| Brazil | 1,153,000 | Belgium | 77,500 |
| Russia | 1,010,421 | Portugal | **76,000** |
| Nigeria | 700,000 | Czech Republic | **70,000** |
| Iran | 560,000 | Hungary | 66,000 |
| Mexico | 406,937 | Ecuador | 64,777 |
| Germany | **405,000** | Guatemala | 59,524 |
| Peru | 358,519 | Austria | 54,778 |
| Tunisia | 345,000 | Romania | 52,600 |
| Spain | 317,500 | Australia | 50,000 |
| Argentina | 265,279 | Switzerland | 43,140 |
| France | **237,332** | United Kingdom | 35,000 |
| Chile | 216,481 | Costa Rica | 27,548 |
| Greece | 195,000 | Netherlands | 23,335 |
| Venezuela | 191,543 | Slovak Republic | 22,000 |
| Poland | **145,000** | Sweden | 20,200 |
| Japan | 144,500 | Others | 173,414 |

*Source: Survey carried out by IPO – Oct. 2024*

*The countries that responded to the survey are shown in bold*

**The figure includes dry pasta production for retail, foodservices and industrial use (dry pasta used as an input into value-added products, such as soups, prepared froxen foods, boxed pasta dinners, etc.).*

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# Countries where most is invested in pasta

- Nigeria
- Angola
- Egitto
- Libia
- Russia

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# Economic and environmental sustainability

Energy savings

Flexibility

Performance

Efficiency

New market presentation

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Double square bottom


Square bottom


Pillow


Box


Flowpack


Carton

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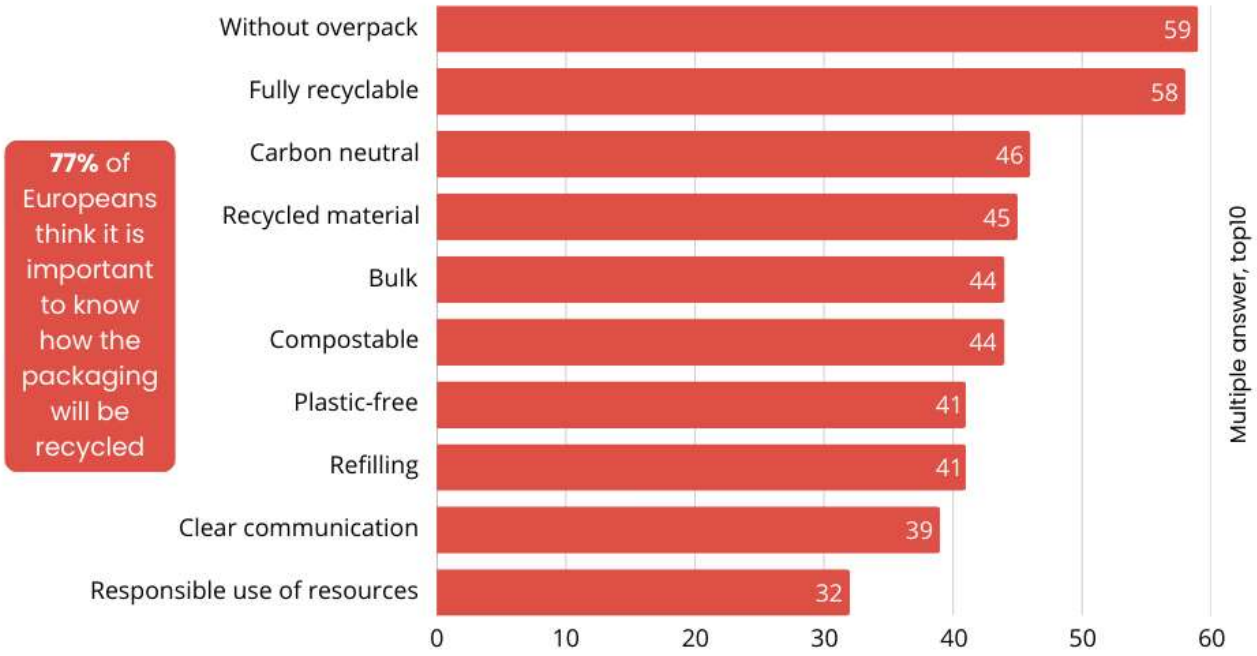
## Characteristics of sustainable food packaging

What do consumers search for, most frequently, when they want to buy a food product with sustainable packaging?




**77%** of Europeans think it is important to know how the packaging will be recycled

**Source**: consumer packaged goods observatory *Nomisma*

**Target**: 18-70 years people

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# Paper vs. Plastic LCA

| Indicator | Kraft Paper | Plastic (PP) | Advantage for Paper? |
|---|---|---|---|
| Global Warming Potential ($CO_2$-eq) | 6.53E-03 kg | 1.86E-02 kg | ✅ 65% reduction |
| Acidification Potential ($SO_2$-eq) | 2.69E-05 kg | 8.75E-05 kg | ✅ 69% reduction |
| Eutrophication Potential ($PO_4$-eq) | 8.80E-06 kg | 6.73E-06 kg | ❌ 31% higher |
| Photochemical Ozone Creation Potential (NMVOC) | 2.79E-05 kg | 4.46E-05 kg | ✅ 37% reduction |

**Key Explanations**:

- **Higher eutrophication for paper**: Caused by **chemical oxygen demand (COD)** and **nitrogen oxide ($NO_x$)** emissions during paper production.
- **Material production dominance**: PP has a larger impact on global warming, acidification, and ozone creation, while paper emissions stem directly from mill operations.

## Effects of End-of-Life (recycling/incineration):

- **Paper**:
  - 88% recycled, 12% incinerated.
  - **Eutrophication improves by 80%** due to recycling, surpassing plastic.
  - Global warming increases slightly (+15%) from incineration emissions.
- **Plastic**:
  - 48.5% recycled, 51% incinerated.
  - Reductions in acidification, eutrophication, and ozone creation, but global warming increases (+10%).

**Final Outcome**: Including end-of-life, paper outperforms plastic **across all indicators**, including eutrophication.

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# Recyclability vs. Compostability

Comparative Analysis of Certified Recyclable Paper Packaging vs. Industrial Compostable Packaging in Plastic Waste Reduction

Certified recyclable paper packaging demonstrably offers a stronger and more guaranteed end-of-life pathway than industrially compostable alternatives. Key advantages include:

1. **Established Infrastructure**: Ubiquitous curbside recycling systems vs. limited composting access.
2. **Lower Contamination Risk**: Consumer familiarity reduces misfiling compared to compostables' look-alike dilemma.
3. **Proven Circularity**: Multi-cycle recyclability conserves resources and directly displaces virgin plastic demand.
4. **Reliable LCAs**: Recycling's emissions savings and landfill diversion are consistent, whereas compostables' benefits depend on ideal disposal.

- While compostables excel in food-contaminated niches, their infrastructure gaps and conditional degradation make them less reliable for broad plastic waste reduction. Prioritizing recyclable paper aligns with circular economy principles, ensuring materials re-enter production cycles rather than relying on composting's uncertain end-of-life.

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# Packaging Sustainability Intro

Inspired Fiber
Papermaking & Sustainability Consulting LLC

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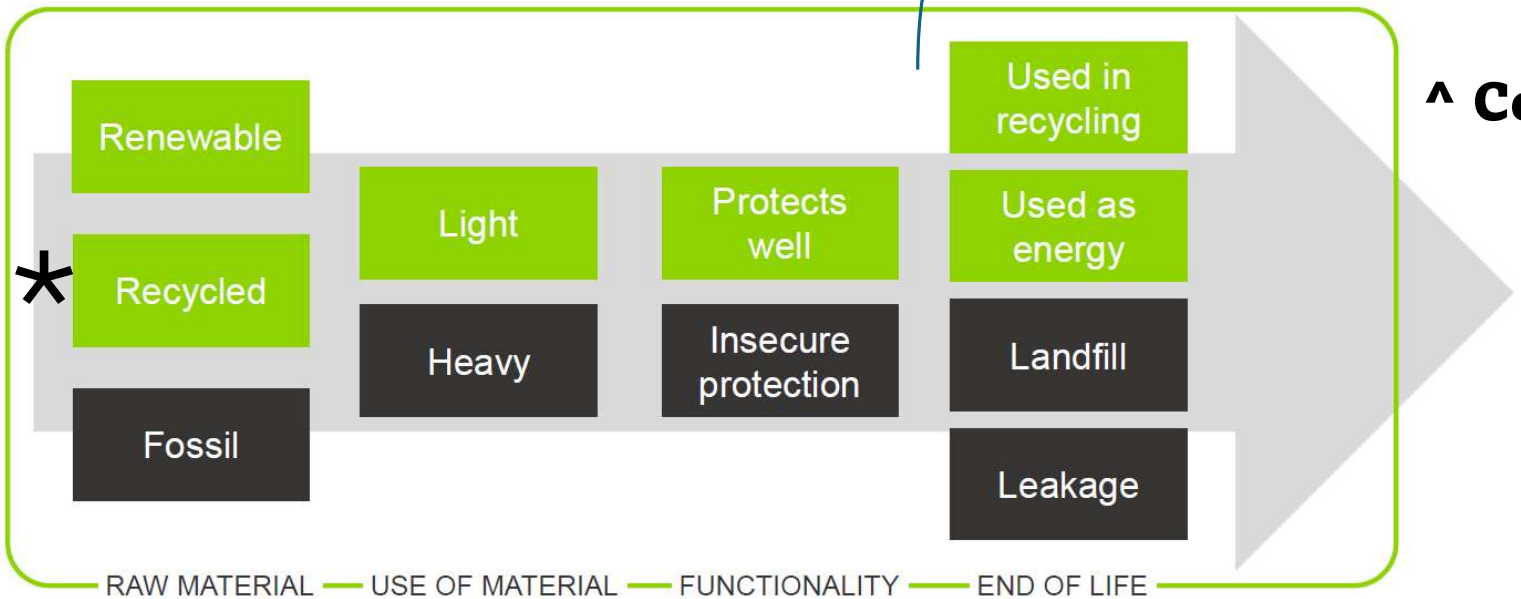
# Sustainability: One Slide

Certifications Focus on End-of-life




^ **Composting**

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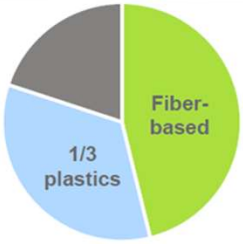
# Plastic has a problem

## Plastic's big issues are landfill and leakage


Source: Ellen MacArthur Foundation, 2013 "The New Plastics Economy"

Metsä

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# Paper is a Great Story

## 2023 Paper Recycling Rate


Source: AF&PA Statistics

## 2023 Cardboard Recycling Rate


Source: AF&PA Statistics

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# Product Certifications

- The FTC Greenguides state that all environmental claims need 3rd party validation

recyclable

passes WMU standard
wmupilotplant.com

Recycle if Clean & Dry

Store Drop-off

PLASTIC WRAP

how2recycle.info

Recycle if Clean & Dry

Compost* if Food-Soiled

PAPER PLATE

how2compost.info

*Not in backyard; Composting programs for this plate may not exist in your area.

BPI COMPOSTABLE

compostable

certified by WMU
using ASTM standards

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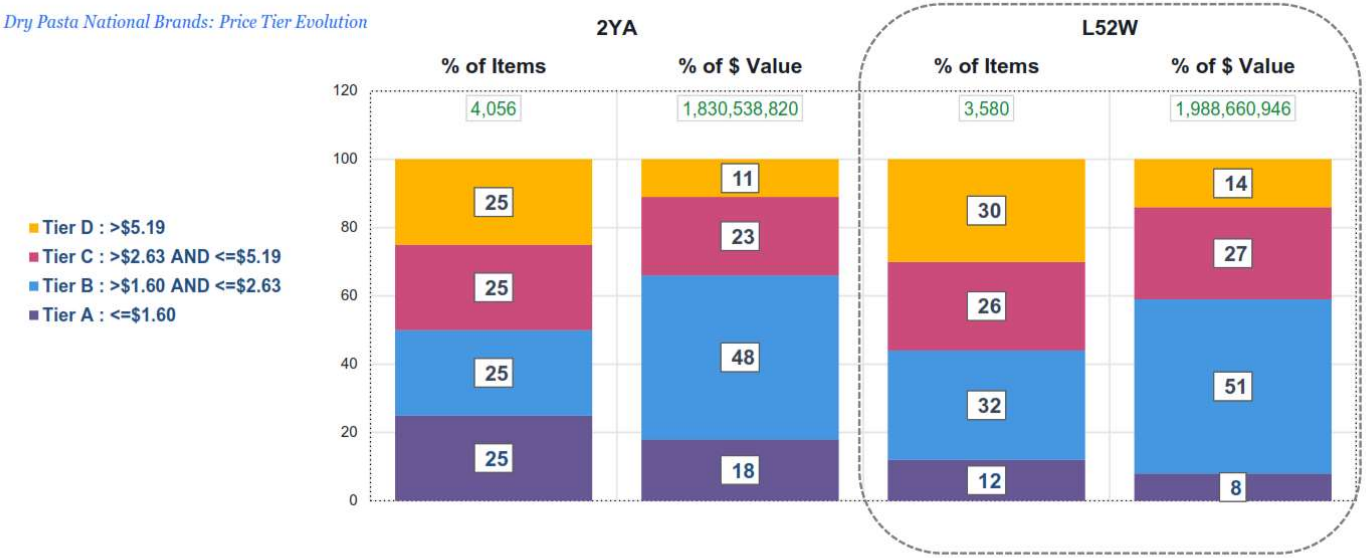
# Value of Sustainability

## Dry Pasta: Mid-low, mid-high price tiers expanded since 2022 as 'value' tier shrank

Assortment in these two middle tiers now contributes well above fair share--nearly 80% of all category dollars

*Dry Pasta National Brands: Price Tier Evolution*




Source: NIQ RMS, Total US xAOC, 52 w/e 10/5/2024 vs 2YA.





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# US Packaging EPR 2025: Key Regulations & Business Impacts

🌎 **Active States**
OR - CA - CO - ME - NJ - MN - WA
*+12 states pending legislation*

🔄 **Circular Action Alliance (CAA)**
- Sole PRO across 5+ states
- Manages fee collection & compliance
- Unified reporting portal live March 2025 (OR first)

📋 **Core Compliance Requirements**
- **Data Tracking:** Material types, weights, recyclability
- **Fee Structure:** Tiered by material sustainability
- **Producer Hierarchy:** Brand owners > importers > distributors

🎯 **2032 Targets (CA Model)**
- 100% recyclable/compostable packaging
- 65% plastic recycling rate
- 25% plastic reduction

💼 **Business Implications**
✓ Multi-state compliance complexity
✓ Packaging redesign costs
✓ PRO registration & reporting systems

## ⏰ Immediate Deadlines

| State | Requirement | Date |
|---|---|---|
| OR | Register + 2024 packaging data | Mar 31 |
| CA | SB54 rulemaking reset | Ongoing |
| CO/MN | PRO registration | Jul 1 |

♻️ **Innovation opportunity: Recyclable materials & light-weighting**

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# Questions?!

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# Thank you!

Stefano Giusti – Policarta

Giovanni Frosini – Ricciarelli

Lon Pschigoda – Inspired Fibers

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