

# Food contact materials from production to consumer – technological and regulatory challenges

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## A package of conundrums

- The challenges for food packaging innovation are high, while the drivers for innovation have been low. Food packaging evolution has been limited as a result. Factors such as price, functionality and convenience have driven choice and development for many years
- The regulatory backdrop for food packaging is dense and hard to navigate. Different systems across the world and a collision of legislation aimed at delivering safe chemicals, safe food and a safe environment directly and indirectly affect food packaging
- Yet, change is in the air. Pressure to reduce carbon emissions and global concern for the impact of plastic pollution are effectively redrawing the rules
- Science Group Sustainability team has seen a sharp increase in queries on packaging – especially food packaging. Clients want support for (evidence-based) decisions and claims, finding new solutions, and anticipating / navigating the future regulatory landscape



## Scissors paper stone

- What does sustainable packaging look like? There is no simple rulebook, method, signpost or algorithm
- Reduce, reuse, recycle
  - Waste reduction is critical and within a company's control, but reuse and recycling more complicated
  - Lack of infrastructure to manage packaging waste
  - Visibility and claims. Lack of foresight
  - Material selection is critical
- E.g. paper is often seen as having better sustainability prospects than plastic, but this is not necessarily supported by science
  - The Wine Society announcement
  - The Aluminium Association claims
- Lack of global approach, definitions and standards adds confusion
  - 'Bio-based', 'Renewable', 'Recycled', 'Recyclable', 'Biodegradable'
- Plastic paper glass



“Flat plastic wine bottles are the shape of the future”

The Times, August 28 2023

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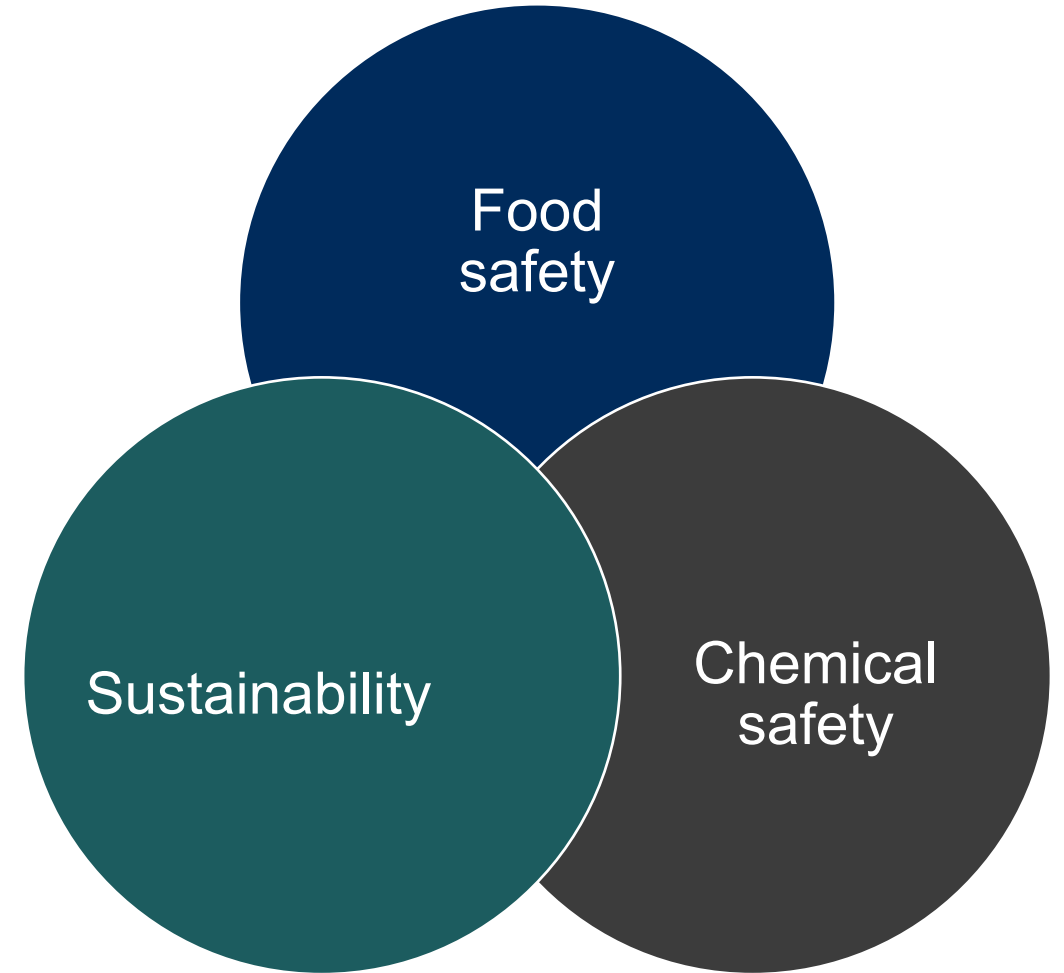
## “The most sustainable beverage package”

The Aluminium Association

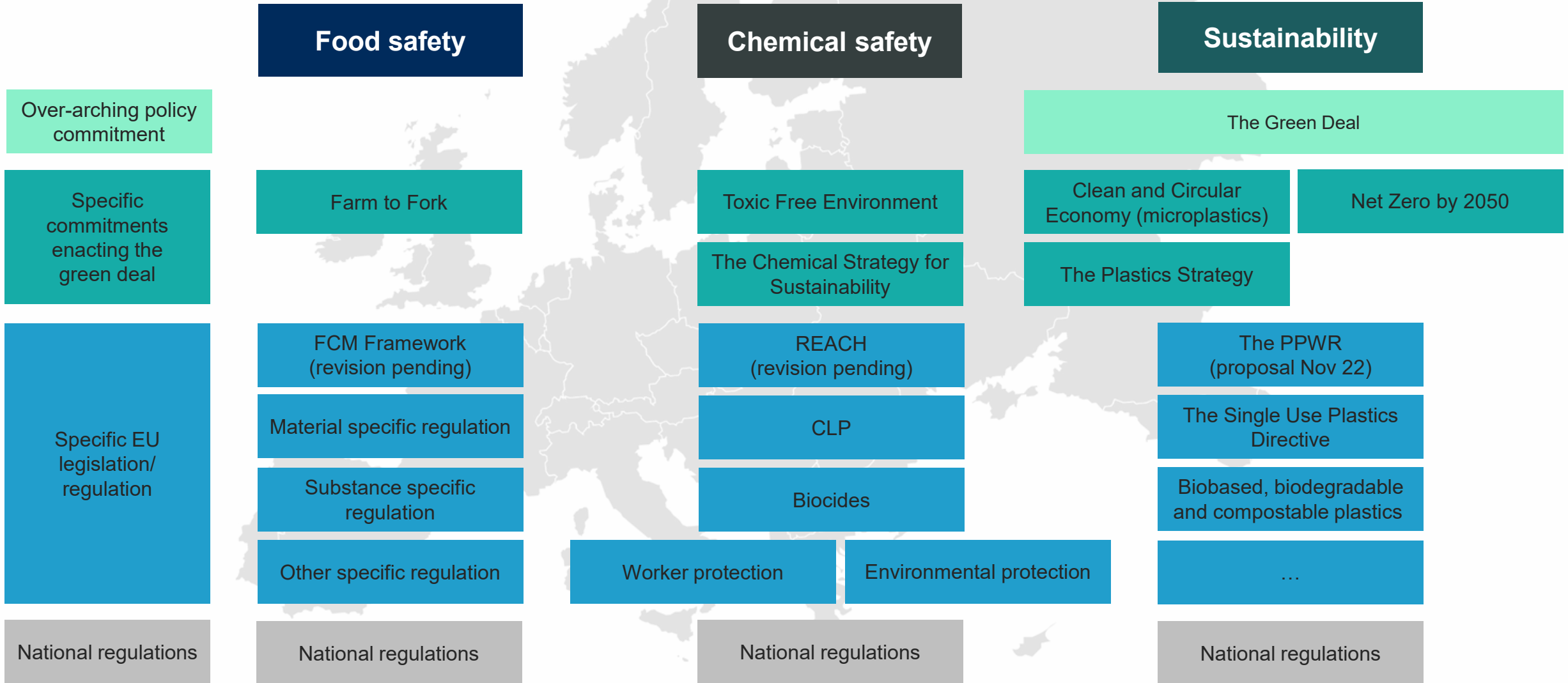
	ALUMINUM CANS	GLASS BOTTLES	PLASTIC BOTTLES (PET)
Consumer Recycling Rate	45.2%	39.6%	20.3%
Industry Recycling Rate	59.7%	N/A	N/A
Closed-Loop Circularity Rate	92.6%	30-60%	26.8%
Recycled Content	73%	23%	3-10%
Value of Material	\$991/ton	-\$23/ton	\$205/ton

# Spotlights on food packaging

- Sustainability and its new imperatives are a primary driver for change
  - New regulations
  - Public commitments (e.g. net zero, reduced waste targets)
  - NGO and public pressure (e.g. 'Mind the Store' campaign)
  - Visibility / brand recognition and impact on brand reputation
- Other standards are unaffected – food safety and hygiene cannot be compromised, longer-shelf life to avoid waste are important, higher costs may not be tolerated
- There is often no clear 'drop in' solution and a clash between these goals. Innovation and/or trade-offs (see paper) may be called for, with decisions underpinned by robust evidence and documentation



# The universe of regulation



# Sustainability drivers

- Commitment to recycle 55% plastic packaging waste in EU (PPWR, 2022), 60% in Japan and 50% in USA by 2030
- Drive uptake of recycled materials in EU through the PPWR
  - All plastic packaging to be recyclable by 2030 (follow on delegating acts to define 'recycled material')
  - Ambitious targets for minimum recycled content in plastic packaging
- Set requirement that certain plastic packaging items (e.g. filter coffee pods) must be compostable (no definition on compostable)
- Target single use plastics (SUP)
  - 25% and 30% recycled plastic content in SUP plastic bottles by 2025 and 2030 respectively, as well as bans, marking of plastic content and introduction of EPR on certain SUPs (Single Use Plastics Directive)
  - Bans on certain single use packaging for food and beverages (PPWR)
- Use of fiscal policies (plastic tax) and Extended Producer Responsibility (EPR)



## Minimum recycled content from post-consumer plastic waste targets under EU PPWR proposal

	2030	2040
PET contact sensitive packaging	30%	50%
Plastic non-PET contact sensitive packaging other than SUP	10%	50%
SUP beverage bottles	30%	65%
Other packaging	35%	65%

## Chemical safety

- REACH Regulation is over-arching regulation for safety of chemicals. Requires registration of substances placed on the market, including in FCM
- REACH registration of a food contact substance does not require consideration of human health aspects of FCM use. This means substances of very high concern (SVHCs) under REACH can be permitted in food contact materials in Europe
- Restriction and authorisation to control substances of very high concern (SVHC)
  - CMR not permitted in consumer use
- Measures to regulate chemicals such as BPA, PFAS or microplastics, can have direct and indirect implications for food packaging. It can be hard to track, assess and plan for upcoming issues
- REACH Revision announcement end of 2023. Ongoing regulations around the world



McDonald's announces global PFAS ban in food packaging



# EU Framework Regulation on FCM (1935/2004)

## Policy themes and pillars of pending revision (ca 2025)

### Safety and sustainability of food contact materials (FCMs)

Focus on **final materials** (and non-intentionally added substances) with better definition on level of safety required

**Prioritise substances**, with clear rules for a tiered approach to risk assessment of all substances that migrate from FCM

Support more sustainable alternatives, fewer hazardous substances, more sustainable use of FCM and coherence with related EU rules

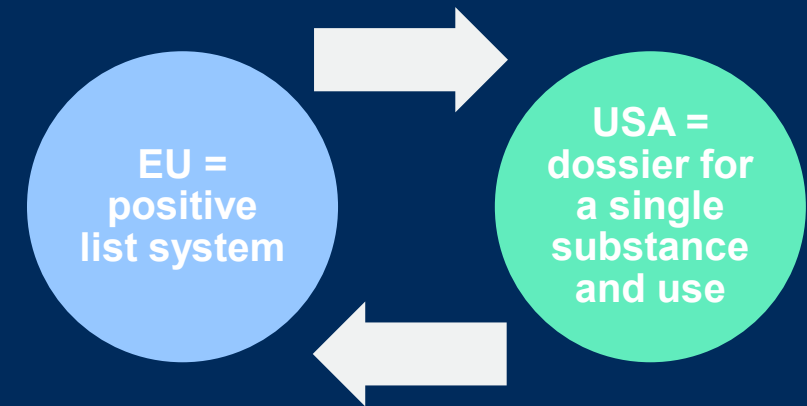
### Information exchange, compliance and enforcement of FCMs

Improve quality and accessibility of supply chain information

Compliance verification and undertaking of official controls

Analytical methods and migration testing rules

The EU's approach to FCM approval differs to that of the US



## Circular economy – can recycled materials be safe?

- Sustainability and The Green Deal is driving the circular economy and recycling of packaging as well as use of recyclable, biodegradable and compostable materials in several ways
- Besides targets for recycling and use of recycled material, new EU regulations under the FCM Framework Regulation aim to promote recycled plastics in FCMs through ‘streamlined’ regulatory approvals
  - Sets up an EU register of recyclers, recycling processes, recycling installations, the facilities where these installations are located, recycling schemes, and novel technologies
  - Removes need to authorise recycling from production loops
- NGOs have expressed concern that consumers may not be adequately protected from exposure to hazardous chemicals under these rules / mechanical recycling cannot produce food safe materials
  - Recycled materials can contain many contaminants e.g. from inks, adhesives used in the original packaging as well as breakdown products
  - Recent studies indicate mechanical recycling of plastics creates microplastics



# Challenges for FCM innovation and investment

## Disharmony across markets

- Regulatory divergence and differences in scope and timing of current & future requirements & priorities
- Absence of common technical standards
- Infrastructure (e.g. collection / recycling facilities)

## Data

- Tracking progress
- Uncertainty on safety, performance & acceptability of new materials & technologies, e.g.
  - Migration of contaminants in recycled materials
  - Bamboo 'powder'
  - Time, cost and risk to bring new products to market
  - Public outrage and behaviour

## Assessment complexity

- Missing robust, like-for-like assessment methods to make decisions regarding a range of different materials and technologies
- Lack of scrutiny on claims and reporting (greenwash)

## Supply chains

- Limited & competitive supply
  - Sourcing bio-based / renewable packaging vs local non bio-based material

Industry readiness



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