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Innovation in smart labelling for food and beverages

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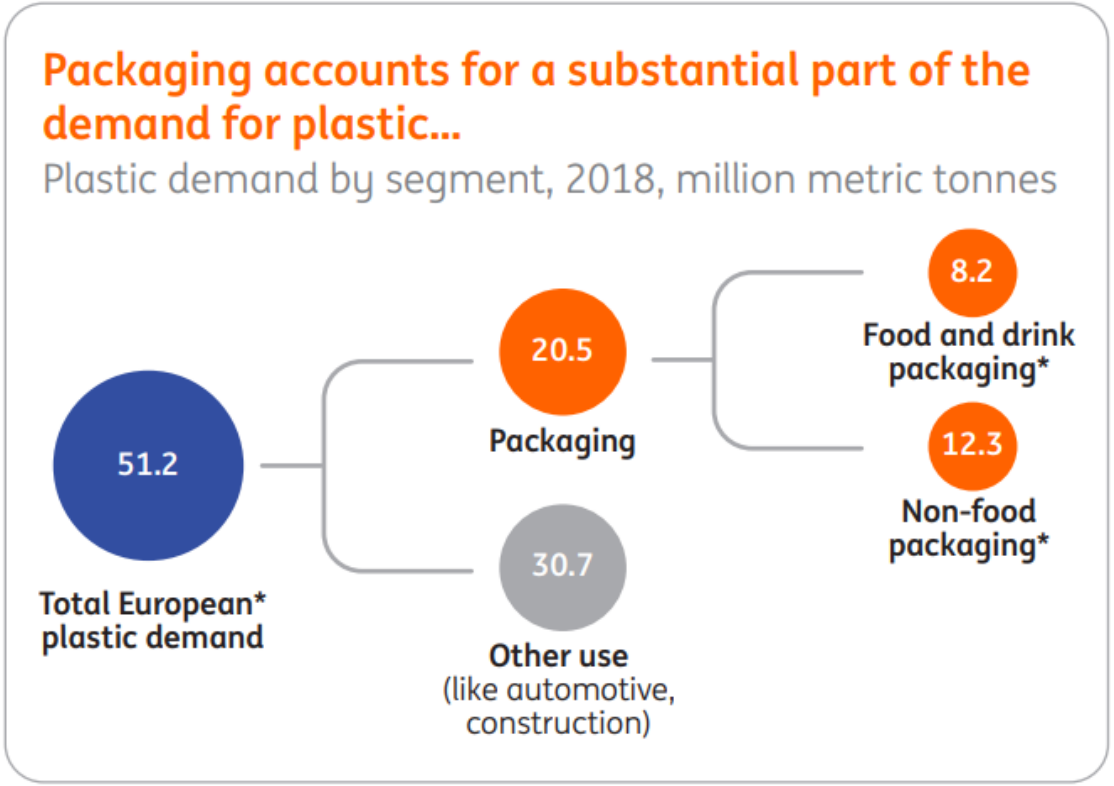
The current scenario

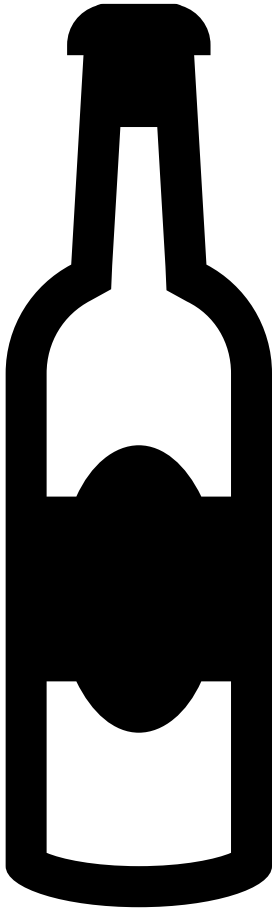
Plastic packaging in the food & beverage industry

- An estimated 8.2 billion kilos of plastics is used for food products.
- The amount of plastic packaging is predicted to grow, at the expense of other packaging materials.
- The growth may be attributed to growing populations around the world, as well as evolving demand for convenience.
- There are no single solutions for now.
- Regulations are evolving around the world to support technology developments to reduce plastic packaging use & waste, as well as increase recyclability.



Source: ING_-_The_plastic_puzzle_-_December_2019_(003).pdf

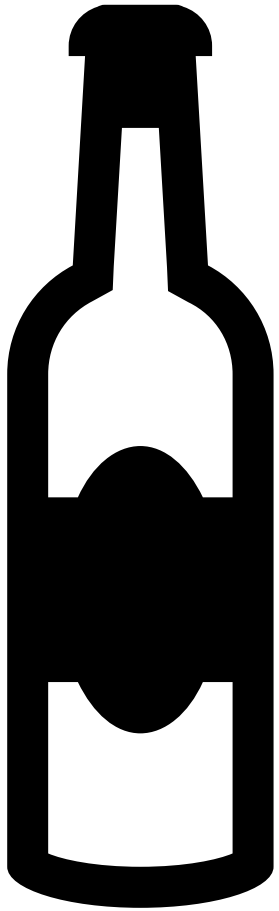
Dissection of a food / beverage package



1. Use smaller packaging
2. Reduce need for secondary packaging
3. Reduce the amount of plastic being used in packaging
    - Container
    - Cap
    - Label

- The Plastic Packaging Tax (PPT) will apply to all plastic packaging manufactured in, or imported into, the UK that contains less that 30 per cent recycled plastic
- The rate of PPT will be £200 per metric tonne of plastic packaging
- Came into effect from 1 April 2022

Dissection of a food / beverage package



1. Use smaller packaging
2. Reduce need for secondary packaging
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    - Container
    - Cap
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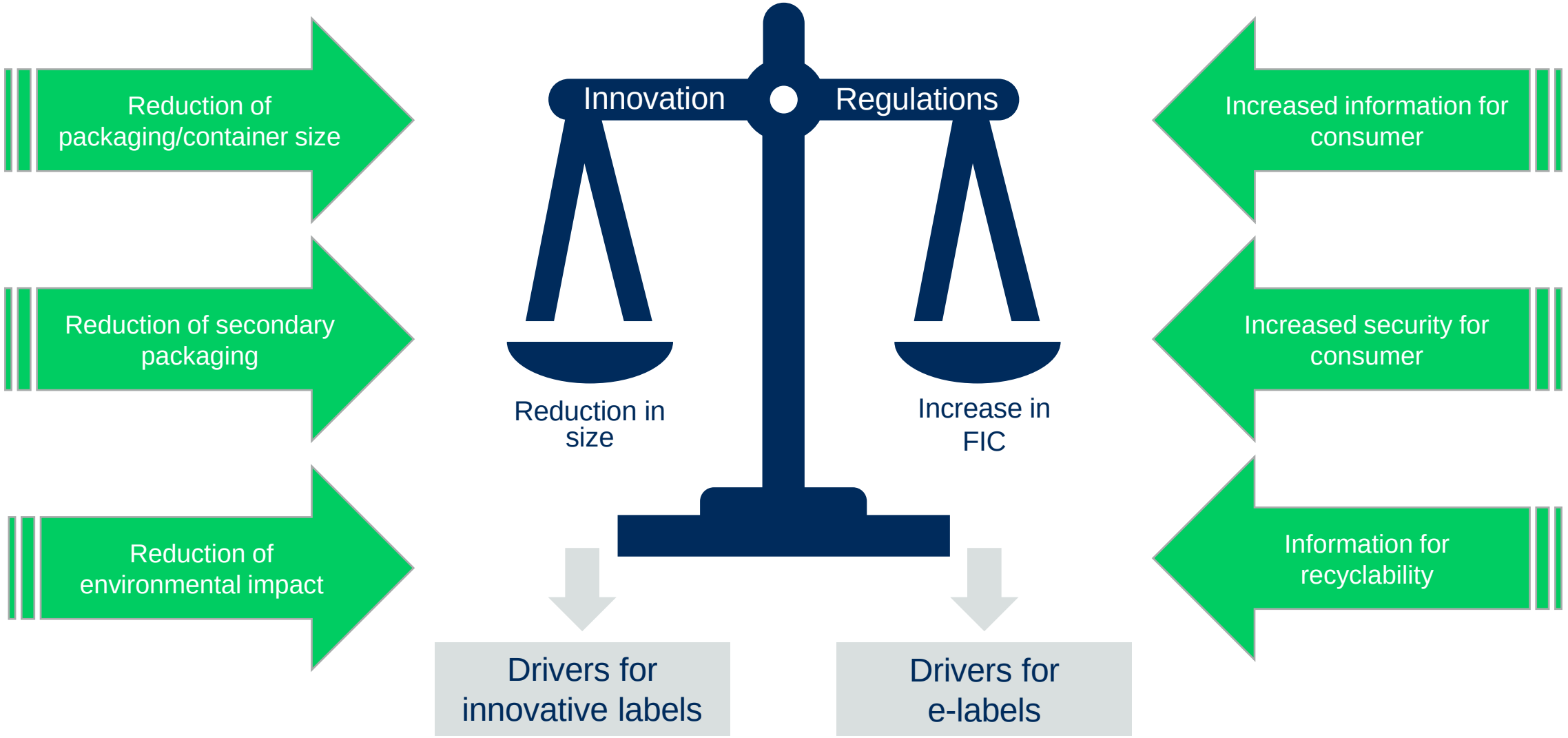
4. Use alternative materials (bio-based)
5. Increase the recyclability of packaging

Balancing innovation and regulations



1. Using smaller packaging

Reduce the **size of the pack**, **weight of the product**, the **shape of the product** and removal of additional features

- Tesco reduced plastic used in cheese packaging, reducing the weight from 460g to 400g, removing the re-sealable zip and changing the shape from square to rectangular

Source: [Change to Tesco cheese packaging will save 260 tonnes of plastic annually (circularonline.co.uk)]

2. Reducing need for secondary packaging

Companies have been **reducing secondary packaging** for some time to cut down on the use of materials, especially plastic

- Walkers crisps reduced the size of their multipacks by 30% in 2018

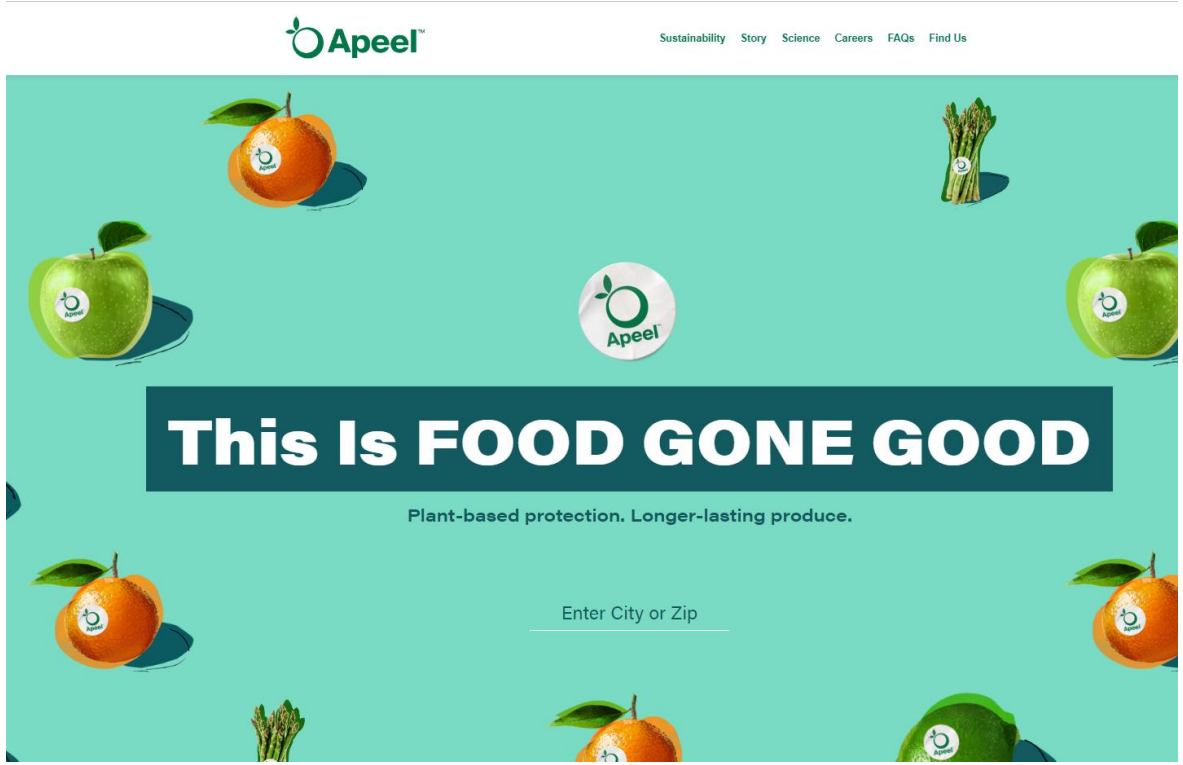
Source: [Walkers Crisps to cut plastic by 30 percent across snacks multipacks (pepsico.co.uk)]

3. Reducing the amount of plastic being used

Replacement of plastic rings

4. Using alternative packaging materials (bio-based)

Layer of edible, plant-based coating is applied to fresh products, eliminating the need for plastic packaging



Source: https://www.apeel.com/

Development of biodegradable packaging from food-based biopolymers

5. Increase recyclability of packaging

- World’s first fully-recyclable food-grade plastic bottle
- Bottle made from enzymatically recycled plastic
- Adaption of enzyme to break down polyethylene terephthalate plastic

EU Commission:

Strategy for plastics in a circular economy – 100% recyclability by 2030

Source: ‘World’s first’ fully recycled food grade plastic bottles unveiled (foodmanufacture.co.uk)

Technology transfer from other industries

Ecodesign principles are changing the size and shape of packaging

Neopac reduced the sleeve wall, cap and shoulder thickness in a tube pack which uses 30% less material

Source: Neopac reduces sleeve wall, cap and shoulder thickness for material-saving new tube | Article | Packaging Europe

Exploitation of concentration

Kao has combined design with additional concentration leading to a smaller pack size for Attack 3X

Source: Kao | Reducing Packaging Materials

Combination of concentration and refill

Moving to refills combined with concentration reduces the pack size e.g. Unilever with Cif

Source: Rethinking plastic packaging | Unilever

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Focus on e-labels

What is electronic labelling?

Three Types

Digital display on device's screen

Machine-readable code

Link to a website via a text URL

www.companywebsite.com

Pros and Cons

Pros

- ✓ Consistency
- ✓ Real-time updates
- ✓ Increased readability
- ✓ Reduction of environmental impact

Cons

- × Access depends on internet availability
- × Smartphone technology
- × Difficult for older generation

Regulations for e-labelling very limited – still in infancy

Aim: To address the gaps and develop broad guidelines on the use of technology in food labelling

Timeline: Draft in early 2023

The EU is leading the way in e-labelling

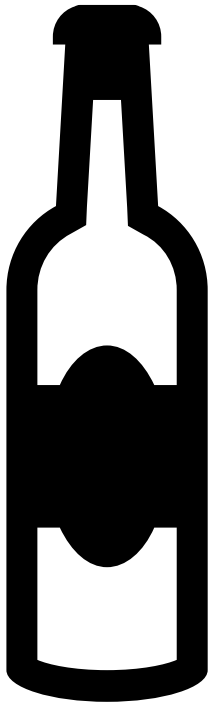
The Common Agricultural Policy (“CAP”) reform published at the end of 2021 requires wines and wine products to inform consumers of the ingredients used and nutritional properties of products by the beginning of 2023

Nutrition information

- Only the energy value must be displayed on-pack, preceded by the symbol ‘E’ for energy
- Full nutrition information may be provided by electronic means

Ingredient listing

- The list of ingredients can be provided by electronic means except for allergen declaration which must be provided on-pack



Information provided electronically cannot include other information intended for sales or marketing purposes and no user data can be collected or tracked.

U-label: Content and subscription

U-label platform (private) enables consumers across Europe to access information via QR code technology about the wine and spirits products they purchase, in their own language.

The dedicated webpage contains the information on a precise product, for a specific market:

- Basic product characteristics (name, image, product category, country of provenance)
- List of ingredients and the nutritional declaration per 100ml
- A pictogram warning against drinking during pregnancy
- A generic message about responsible consumption

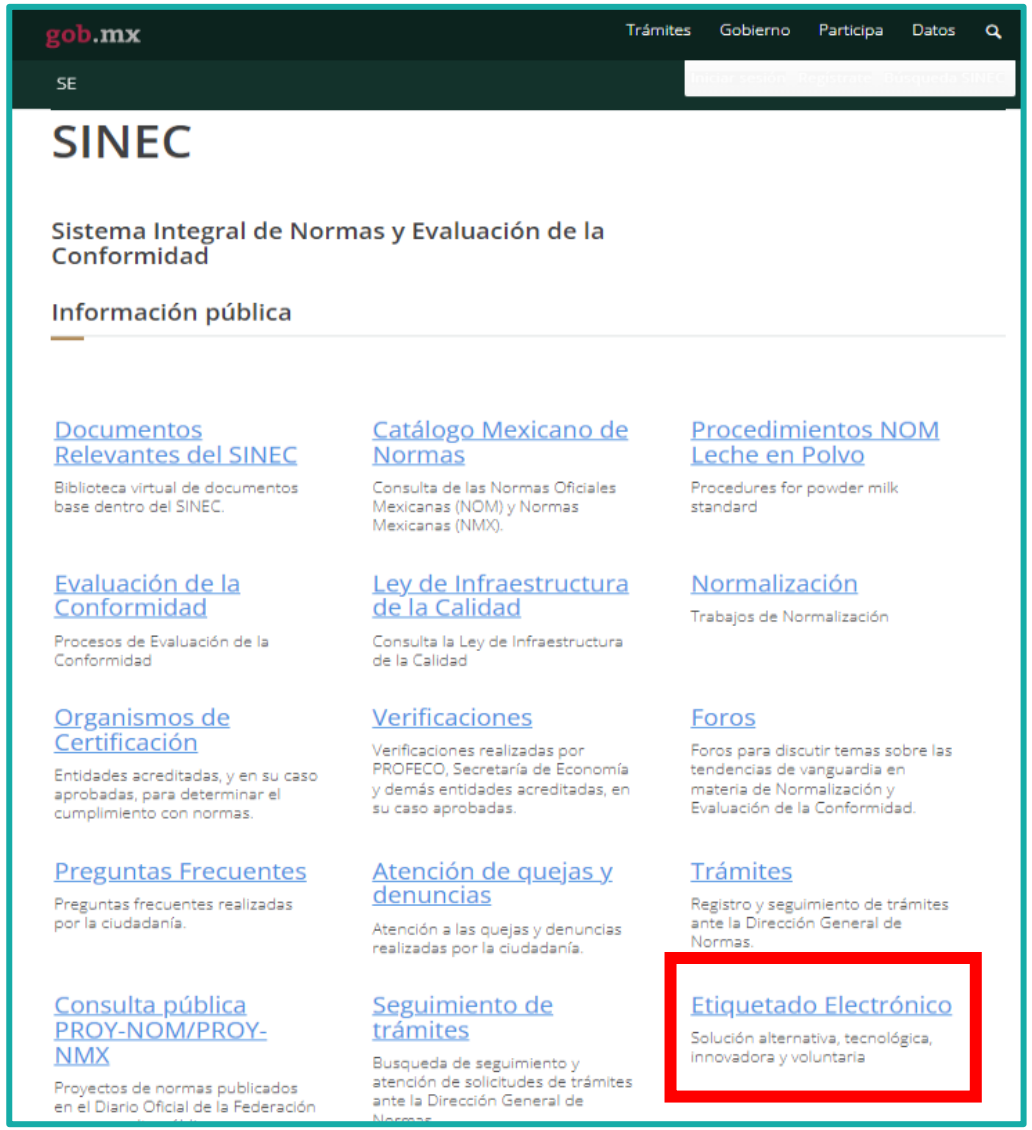
U-label digital platform

Annual subscription plan: three subscription plans (€250, €600, or €2,500), to best fit each company's needs and means.

Requirements for e-labels

Use of e-label to correct inaccuracies

- A new voluntary Standard (NMX- R-116-SCFI-2021) on trade information-general electronic product labelling requirements and specifications was published in December 2021
- Scope:
  - To correct inaccuracies in the actual label of products and/or
  - E-label as a **complementary method**
- Conformity assessment performed by UIA required
- Information to be upload on the Integrated Standards and Conformity Assessment System (SINEC) website. NOT AVAILABLE YET



Data must not contradict the mandatory information expressed on the physical label, except where there is an inaccuracy with the printed data

Compulsory information

- Product’s name
- Brand
- Name, address and contact data of person responsible of the product (name, email and tel)
- Country of origin
- Distributor name, if applicable
- Public contact information of the person responsible for the product, either by telephone, consumer contact, link and/or e-mail.
- Applicable NOM Standard

Complementary information

- Federal Taxpayers' Register of the person responsible for the product
- Product description
- Image of product
- Messages related to social responsibility or responsible consumption
- Instructions/suggestions of use

Must not contain discounts, promotions or misleading information

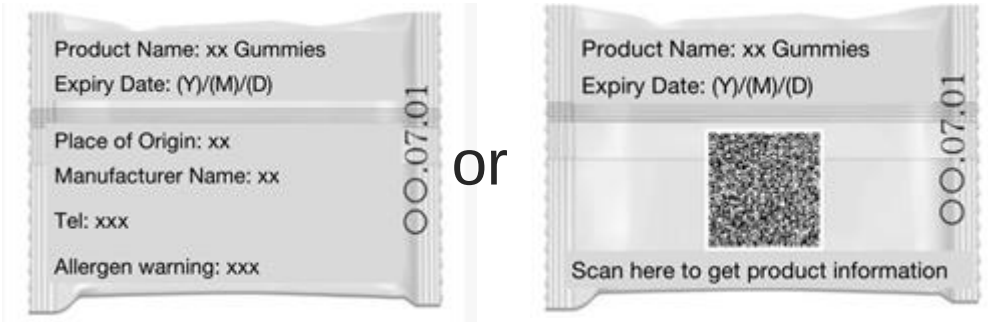
Use of e-labels to provide mandatory information

South Korea

Use of barcode or QR codes to provide the nutrition information in foods and beverages

Taiwan

QR codes can be used to provide mandatory information in small packages i.e. < 20 cm2) except the product name and expiry date that have to be on-pack



Source: Taiwan Specifies Labeling Requirements for Small Prepackaged Food | ChemLinked

Use of e-labels to differentiate bioengineered food

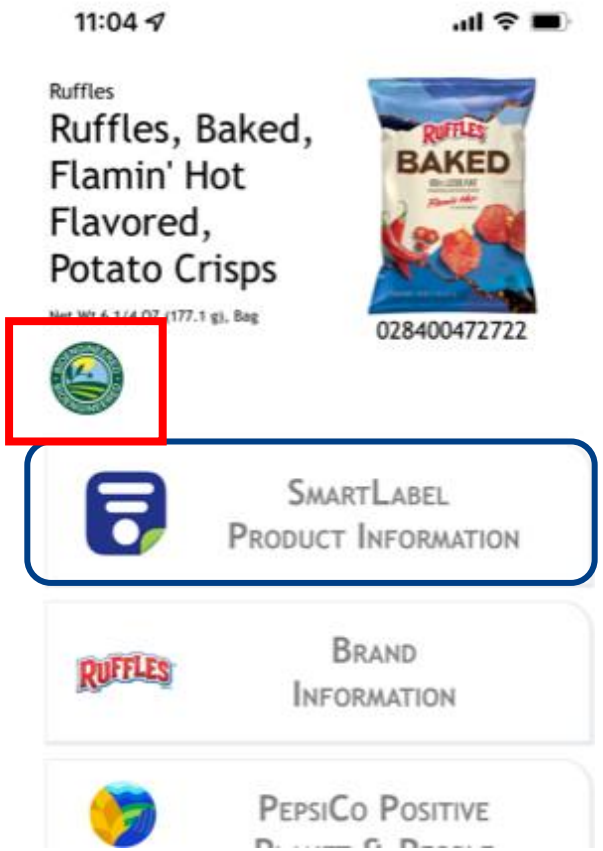
USDA – Bioengineered disclosure

- On-package text, e.g. “Bioengineered food,” or “Contains a bioengineered food ingredient”
- USDA approved symbol for bioengineered food
- **Electronic or digital link** that must include instructions to “Scan here for more food information” or similar language that only reflects technological changes, and include the phrase “Call [1-000-000-0000] for more food information” or
- Text message disclosure must include the statement: “Text [command word] to [number] for bioengineered food information.”

Source: BE Fact Sheet (usda.gov)

Use of e-labels to differentiate bioengineered foods

Source: Mintel



E-labels to enhance alcoholic beverage security – a mandatory requirement

Alcoholic beverage tax stamps include a QR code. The stamps show the products are:

- Legally produced or imported
- Comply with sanitary and fiscal measures

To protect consumers health, contravene alcohol adulteration, commercialisation of illegal distilled alcohol, among other purposes, Authorities encourage consumers to scan QR code (STA's website) and check beverage's information matches data on label.

Since 2022, final consumer establishments MUST scan, in the presence of the consumer, the beverage QR code, prior to opening the bottle.

National products

Imported products

E-labels to enhance alcoholic beverage security – a mandatory requirement

QR code information

Stamps

- Type (national or imported)
- Folio no.
- Lot
- Manufacturing date

Alc. beverage

- Brand
- Type of drink
- Alcohol content
- Volume
- Country of origin
- Manufacturing date
- Lot
- Producer, manufacturer, packer or importer data (Federal Taxpayer Registry (RFC), name & address)

E-labels to enhance alcoholic beverage security – a mandatory requirement

QR code is used to ensure traceability (authenticity, registration and taxation) of alcoholic beverages

Consumers can also scan this QR code using phone apps to check whether alcoholic beverages are genuine or not

E-labels to enhance food security – a mandatory requirement

- Decree No.1957 requires the labelling of certain products with Data Matrix code (QR code) since 1 October 2020
- All products manufactured or imported into Russia must be registered in the "CHESTNY ZNAK" ("HONEST SIGN") system and their packaging must contain a QR code
- Reasons for implementation:
  - Distribution of low-quality products
  - Counterfeit products

Currently covered products: Dairy products, packaged water

Trialled products for next round of QR implementation: Beer and beer drinks, biologically active food supplements (BAA)

In the future, all products aimed to be QR code traceable

Information contained in the Data Matrix code includes necessary data on the product, including information about declarations and certificates issued for these products.

Source: CCIS-Expertise

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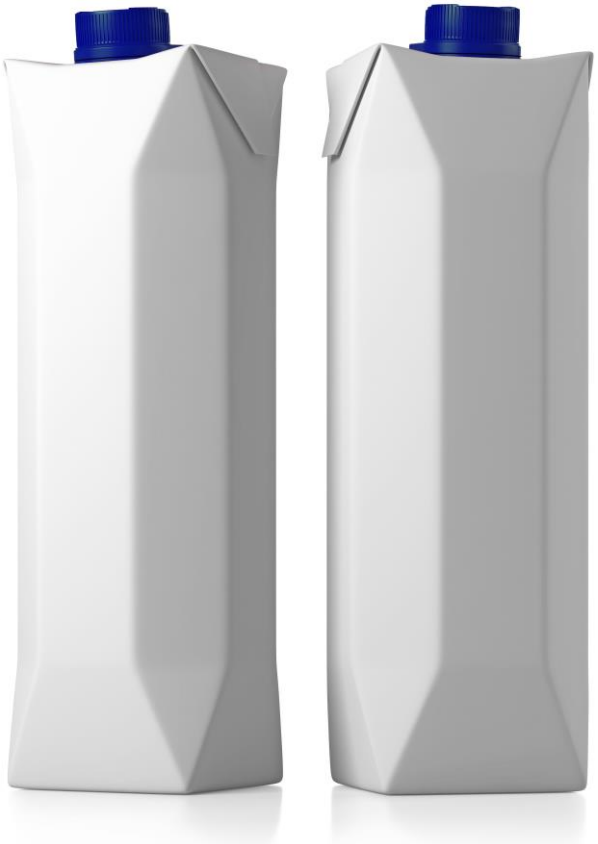
Focus on innovative labelling to support sustainability & recyclability

There are many opportunities for innovative labelling, as long as the general labelling principles are met

Legible

Indelible

Contrasting colours



Non-removable

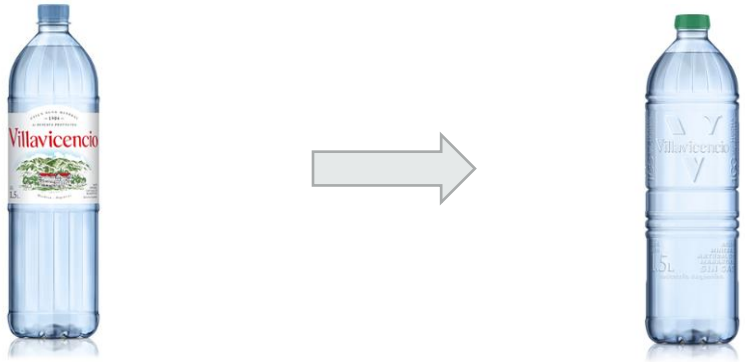
Minimum type size

Location

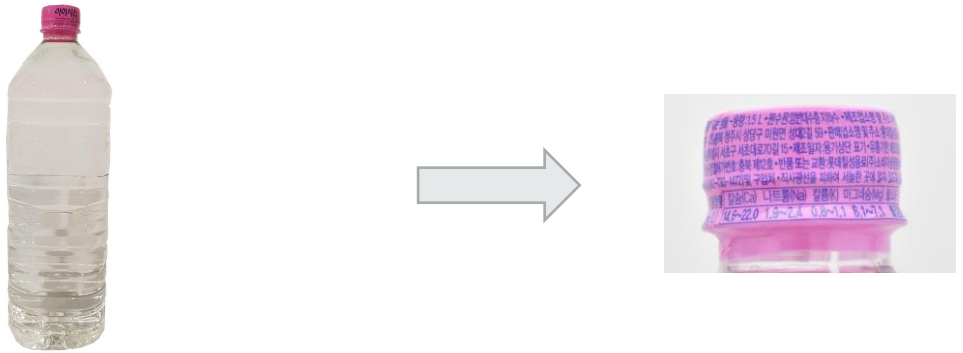
General labelling principles

A global look…

Argentina – single units (embossing)

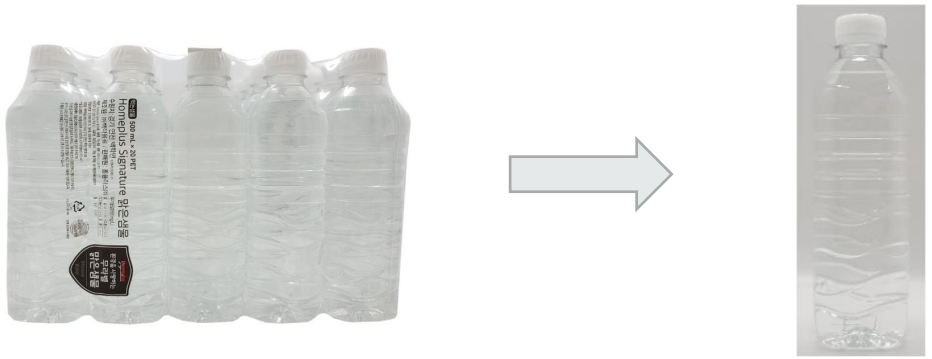


South Korea – single units (smaller labels)



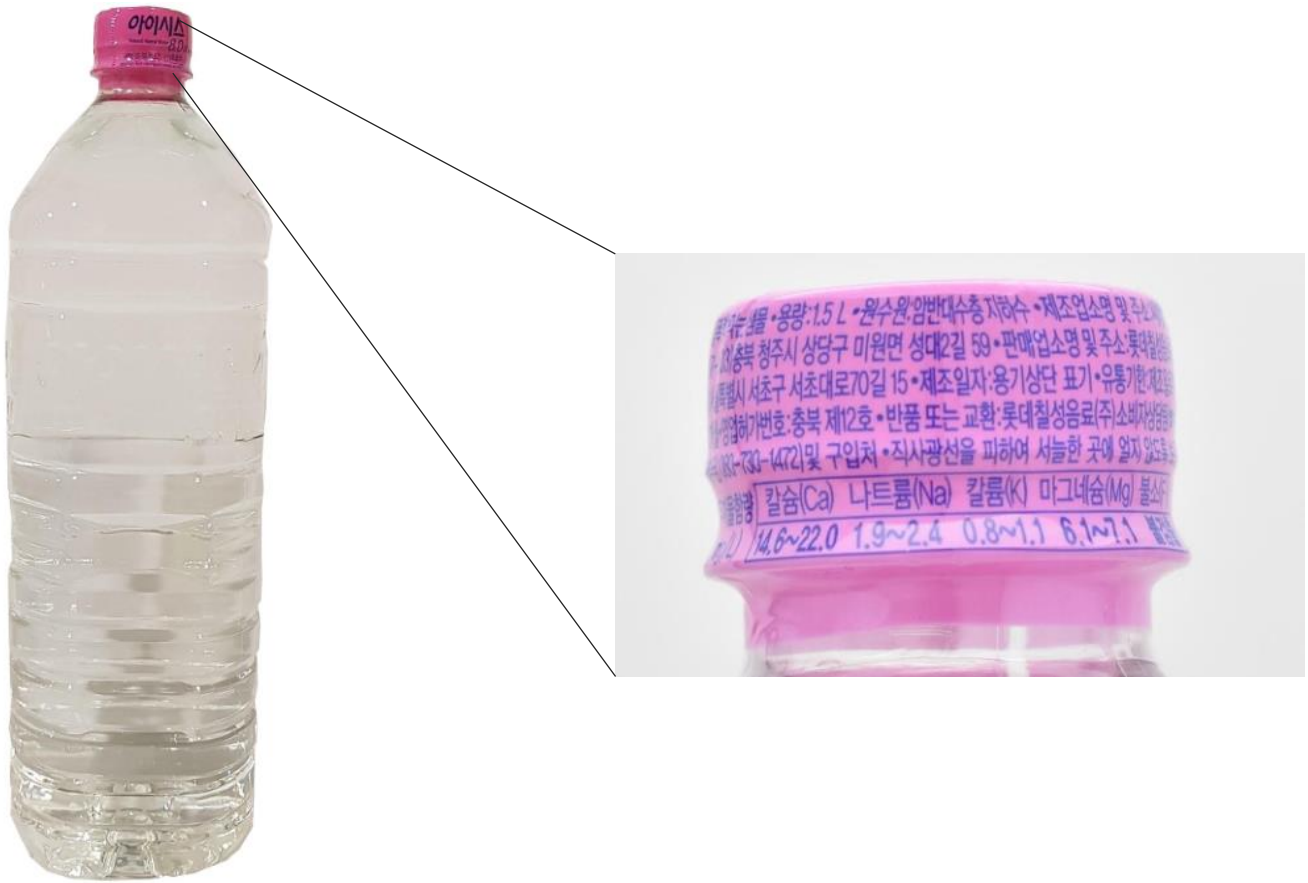
Japan – single unit (eco labels)

South Korea – multi pack (smaller label and label-less)



Source: Mintel

Smaller labels for single units to reduce plastic labels



Source: Mintel

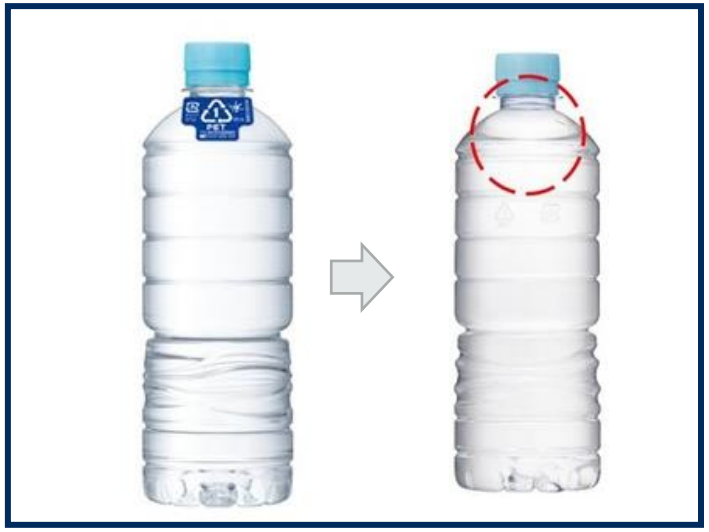
- Mandatory labelling items on a tag attached to a lid on drinking water bottles
- E.g. product name, shelf life, sourced from

The South Korean Ministry of Environment (ME) introduced amendments to the Standards, Specifications and Labelling Standards of Drinking Water and revised the Guidelines of Separate Discard of Recyclable Resources in December 2020

Easily-removable labels for single units to support recyclability

The packaging waste reduction rules and recycling polices are the main drivers for the development of smaller labels that can be easily removed to increase recyclability

Smaller labels for multipacks to reduce plastic labels



South Korea

Carry the label on:

- The outer package or
- On a handle for a multipack product

Instead of labelling on individual bottles

Japan

Removed the obligation to:

- Include the recycling mark on individual bottles, allowing bottles within multipacks to be label-less

(Amendment of the Act on the Promotion of Effective Utilization of Resources (April 2020)

Source: Mintel

Complete removal of labels

In most countries, embossing or lasering is an acceptable form of providing labelling information as long as the general labelling principles, mainly, legibility and use of contrasting colours are met

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Key takeaway

Key takeaway points

- Innovation and regulations are in harmony to address the sustainability issue around use of plastics in the global food & beverage industry
- Whilst most companies are implementing such solutions, there continues to be technical challenges

- E-labels cannot replace the provision of information on pack, but could carry complementary info (e.g. recipes)
- There are a lack of regulatory rules around the use of electronic labelling, which may change in the future, if Codex introduces some guidelines
- Some governments are using e-labels as a tool to:
  - Protect consumers from counterfeit products
  - Collect taxes

- Recyclability and waste management can be addressed through innovative labelling
- The evolving and newly-established regulations around recyclability and waste management across the world will drive innovation for solutions
- Awareness of the current and emerging regulatory specifications during the innovation stage will ensure pre-emptive compliance with the labelling requirements

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Questions

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