PACKALL

PackAlliance:
European alliance for innovation training
& collaboration towards future packaging

Linking Academy to Industry.

Training program: modules

- **Eco-design & novel manufacturing processing**
  - New materials and biomaterials
  - Citizen and Consumer Engagement
  - Residue management and valorisation

Co-funded by the
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1.4. Design for minimization

1.4.1. The correct balance between under-packaging and over-packaging: decrease material usage maintain the right performance

1.4.2. Primary, secondary and tertiary packaging - the trade-offs

1.4.3. Complying with the essential requirements

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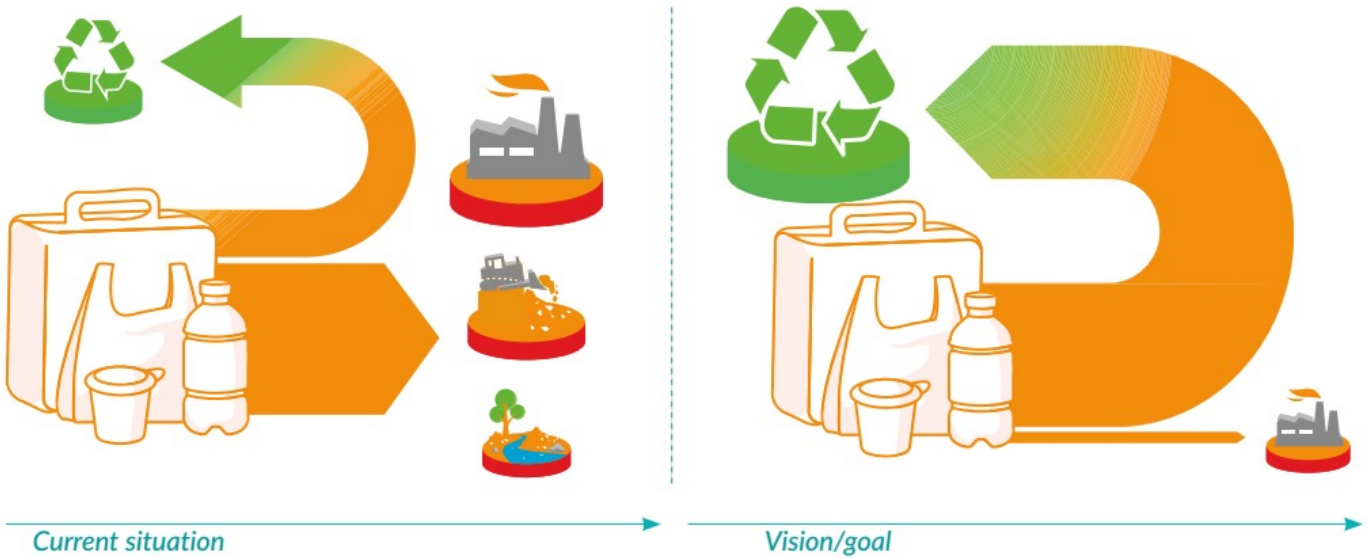
Eco Design. An Attitude

WHAT IS ECODESIGN?

It is a way of doing things. It is an attitude.

An attempt to address all efforts in industrial product development toward reducing the product environmental impact through all its lifetime.



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Eco Design. An Attitude

EcoDesign requires a global vision. It's a choice.

Reduce
Our Impact

Reuse
Our Energy

Renew
Our World

Resolve
Our Lives

Save
Our Planet

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A demanding balance

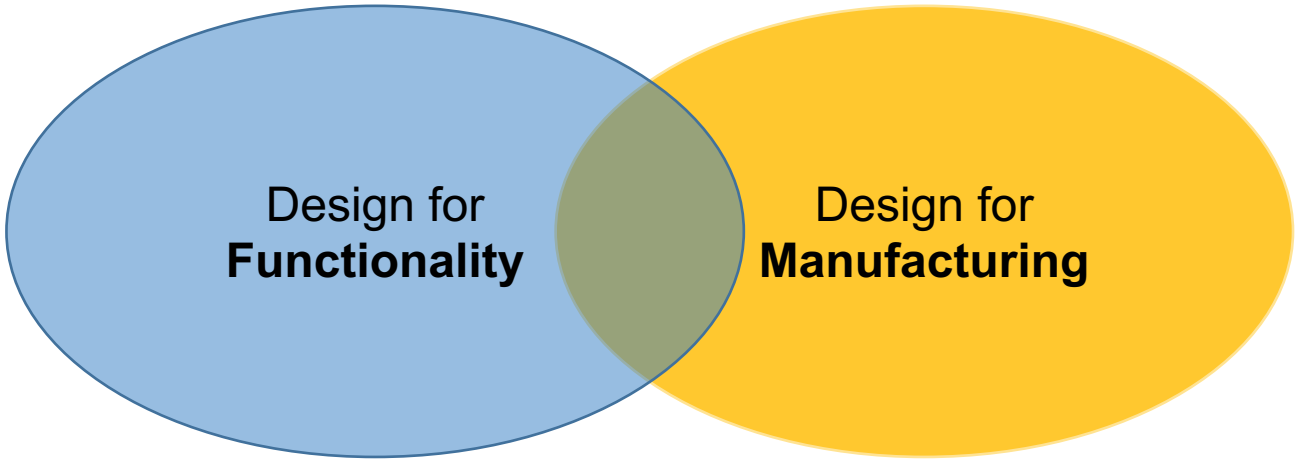
Traditionally, product development must move within a large set of requirements/prescriptions.

Functionality means the product must comply its function, avoiding failure.

No way to sell something that does not work

Manufacturing stands to put designer against the “principle of reality”.

Not everything that comes to mind can be technologically realised



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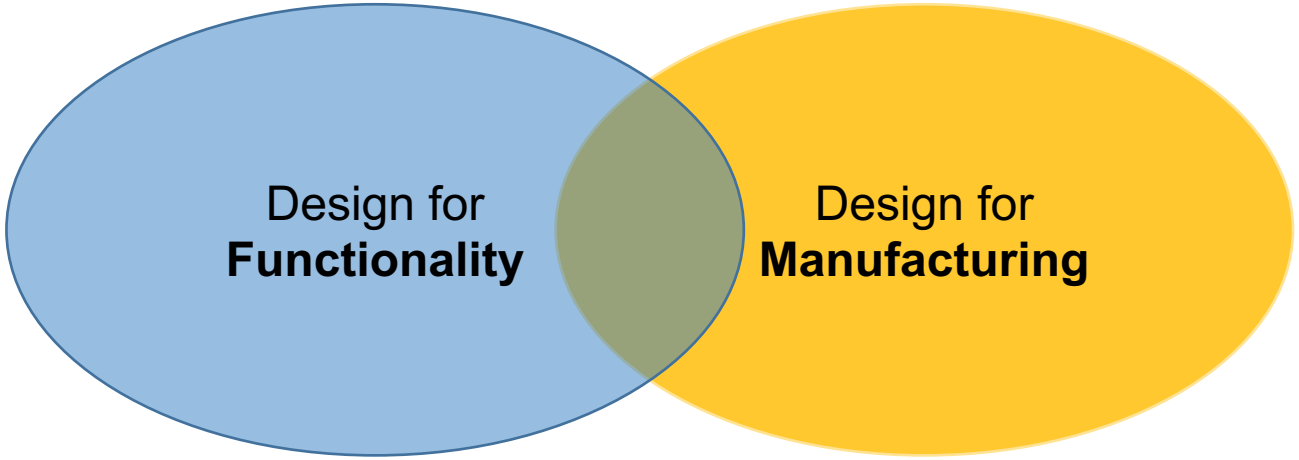
A demanding balance

EcoDesign way of developing products must be carried out together with many other requirements.

During product development, those requirements –technical, economical, marketing– stay strong and cannot be forgotten or neglected, at any extent.



Technical requirements / specs

Production constraints

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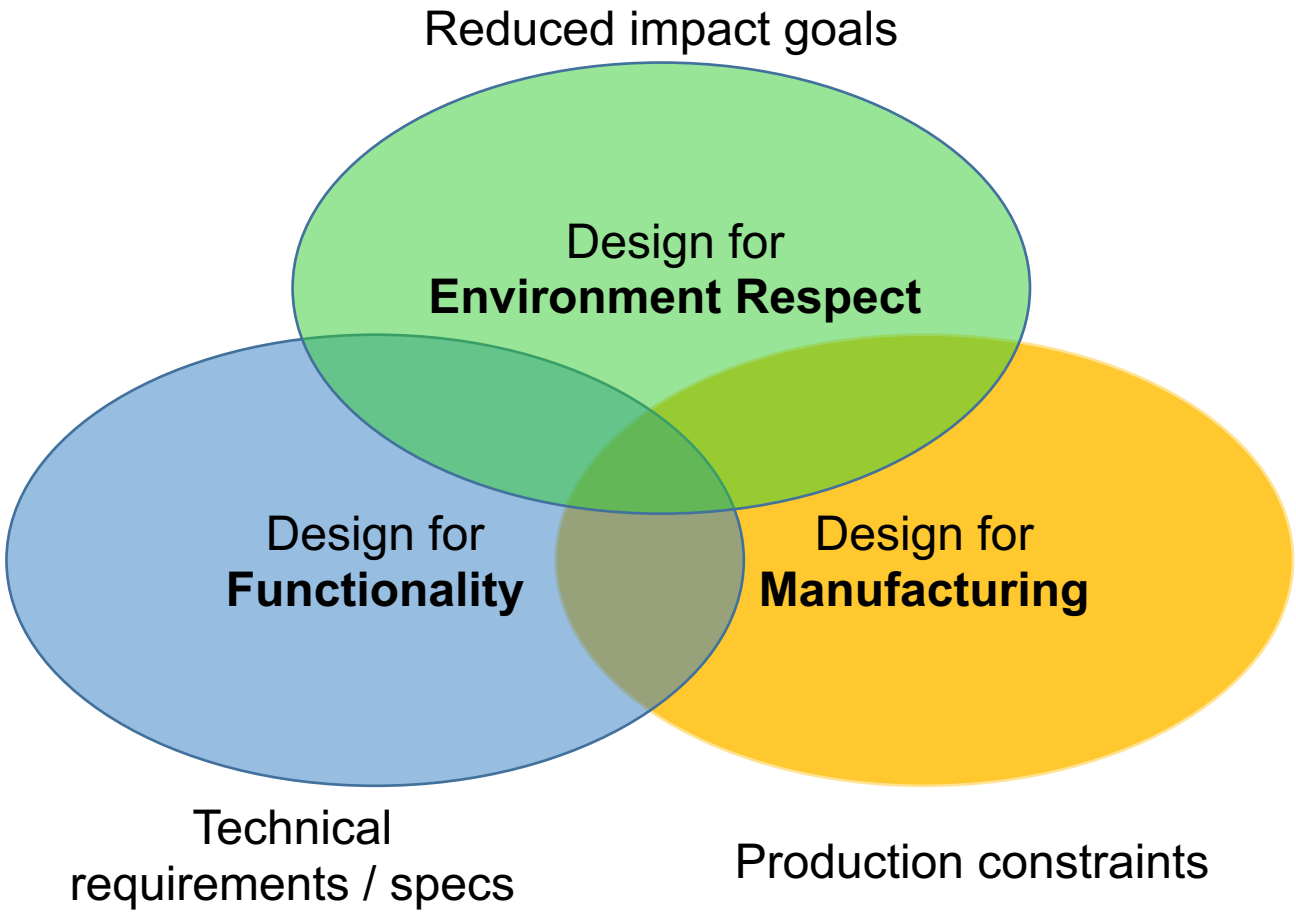
A demanding balance

EcoDesign way of developing products must be carried out together with many other requirements.



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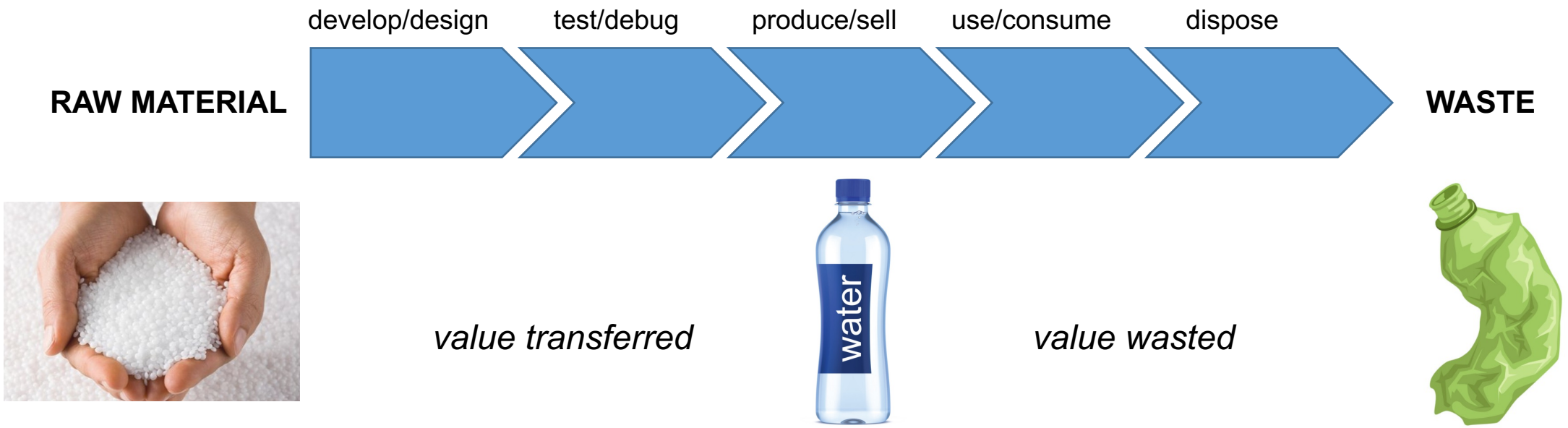
There’s no stronger or weaker requirement to prioritize.

They all are a designer’s ***duties***

Industrial production. An old story

Old-fashioned way to design takes into account too few factors in the chain in a linear approach.



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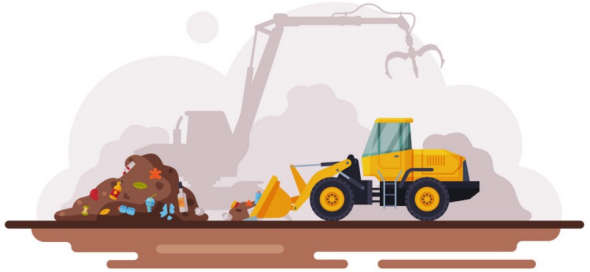
Industrial production. An old story

It has never been a designer's concern what is the product's ending.

Unfortunately.

WASTES TO

ENVIRONMENT.
That's a shame



LANDFILL.
It's a pity

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Industrial production. An old story

In the last years, **a broader approach** integrates some more factor into traditional product development.

raw material production → develop/design → test/debug → produce/sell → use/reuse/refill → EOL management → Dispose/ incinerate

RESOURCE → **WASTE / ENERGY RECOVERY**

value transferred

value wasted
value recovered

THAT'S NOT ENOUGH

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Industrial production. A new opportunity

Nowadays, a newer way of thinking has showed up: the vision to ***turn wastes into resources again***.

recycle/ regenerate | develop/design | test/debug | produce/sell | use/reuse/refill | EOL management | collect/sort

RE-SOURCE FROM WASTES → **TO SECOND LIFE**

value transferred

value recovered

THAT'S THE WAY

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Circular Economy. Restarting the clock of time

Changing our way of thinking. Changing our way of living. Changing our way to design.

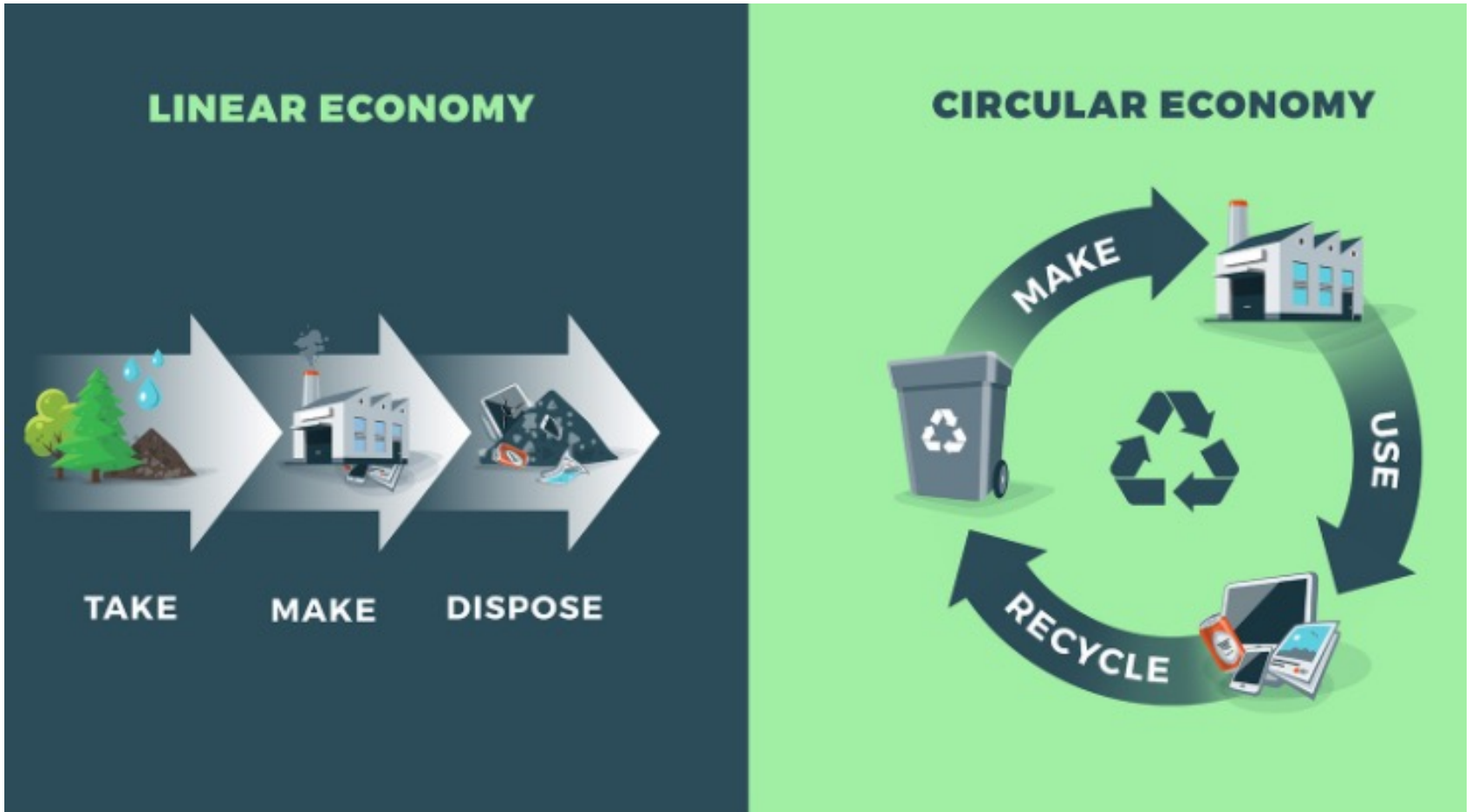
Lost value of materials and products.

Scarcity of resources.

Waste generation

Environmental degradation and pollution

Climate change



Maintaining the value of products and materials.

Innovate products and create value.

Reduce waste, pollution, emission.

Moderate environmental impacts

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A question of strategies

The first step to EcoDesign is setting goals and define strategies.

Goals can be tightly focused or very general:

- reduce littering
- avoid realising materials and substances harmful for animals or plants
- stop the loss of biodiversity
- save energy and resources
- contrast climate exchange

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A question of strategies

In addition, priorities between goals are to be set in a strategical company green policy

Finally, goals must be made clear and communicable to make them shares and, thus, achievable.

Communicate your goal clearly to internal people (decision-makers, managers, workers) and to the outside (investors, share holders, customers).

Make it part of your brand.

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A question of strategies

Companies define corporate strategies as a global guiding light for their people and to persuade customers. Persuasion toward *Environmental Respect* is worthy.

Designers choose their strategies **each time** they approach a project.

EcoDesign strategies can be conjugate to the product, to its function, to its manufacturing route.

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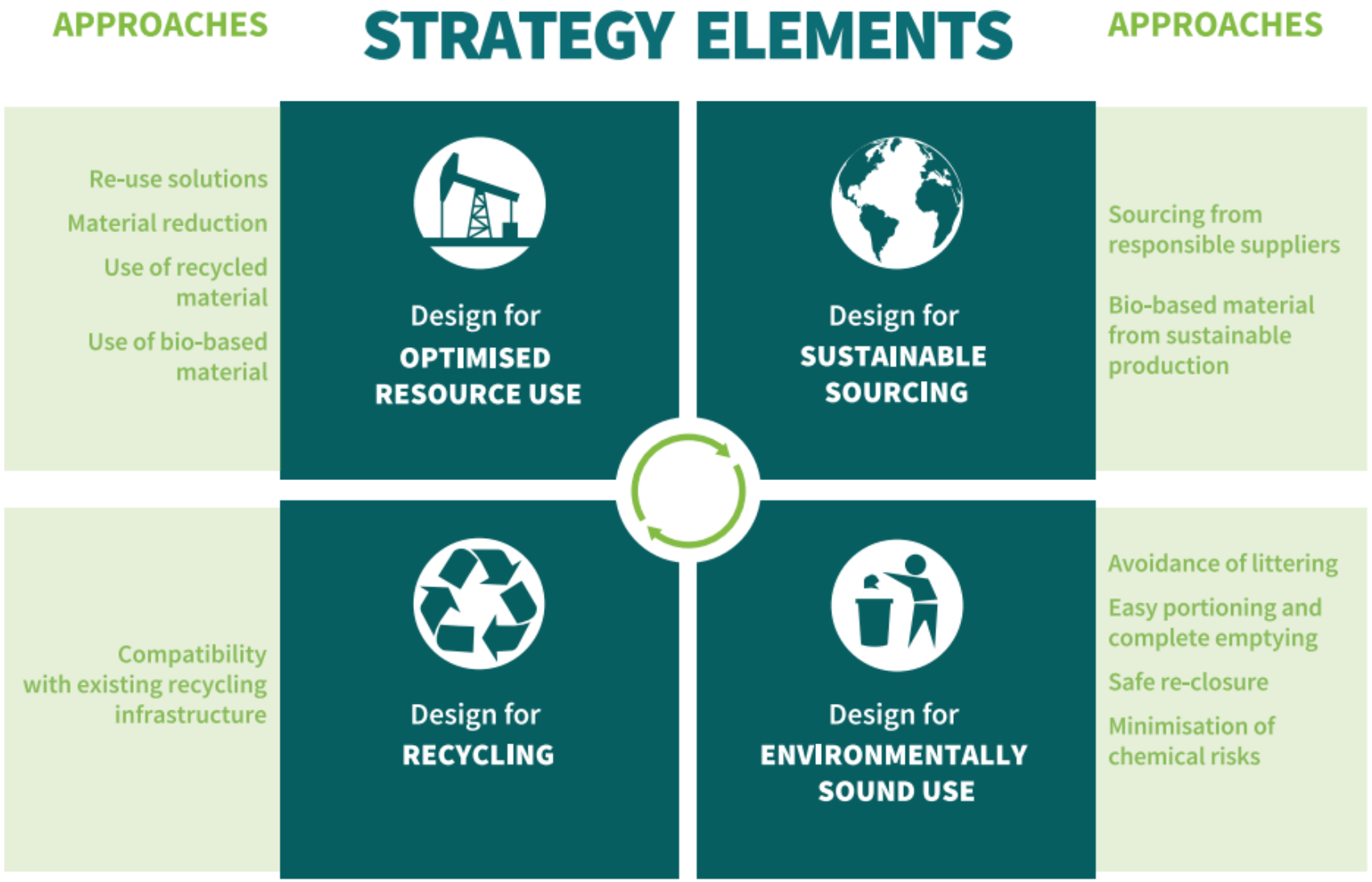
A question of strategies



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EcoDesign for packaging

First of all, packaging is ***protection***

The scope of Packaging. A heavy duty life

The priority function of packaging is **to protect the value** of the goods contained.

During transportation, delivery, stocking and so on, packaging takes care of its content.

Might this function fail, the value is lost.

Many different and demanding solicitations may occur before the goods reaches the customer.

Mechanical, thermal, environmental aggressions have to be faced.

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Packaging materials. Each flavour, its choice

Several kind of materials are used for packaging.

Any provide force-points and limitations.

PAPER AND CARDBOARD

PLASTICS

GLASS

WOOD

METAL

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PAPER AND CARDBOARD

Kraft paper; bleached paper; parched paper; wax paper; paraffin paper; paper bags (for packaging of bakery products, fast food, flour, cornmeal, etc.);

Cardboard boxes (for packaging of pizza, pastries, cakes, cereals, etc.);

Cardboard laminated with polyethylene and aluminum boxes (for packaging of liquid food products that requires hermetically sealing and sterilization);

Cardboard crates (for packaging of fruit and vegetables during transport).

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Packaging materials. Each flavour, its choice

PLASTICS

Bags (for packaging of cereals, seeds, sugar, bakery products, etc.);

Bottles and flasks (for packaging of pasteurized milk, mustard, mayonnaise, tomatoes paste, etc.);

Small capacity containers (for packaging of dairy products: yogurt, cream, fresh cheese, ice cream, etc.);

Drums and barrels (for packaging of milk and dairy products during transportation).

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Packaging materials. Each flavour, its choice

GLASS

Glass bottles (for packaging of juices, soft drinks, mineral water, milk, alcoholic beverages, oil etc.);

Glass jars (for packaging of food products preserved by sterilization, honey, yogurt, candy, etc.).

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Packaging materials. Each flavour, its choice

WOOD

Wooden crates (for packaging of fruits and vegetables during transport);

Wood barrels (for production/processing, transport and storage of wine and other alcoholic beverages, etc.).

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METAL

Aluminium sheets (for packing of butter, chocolate, candies, etc.);

Metallic cans (for packaging of meat products, stewed fruit, mushrooms, beans, peas, etc.);

Aluminium cans (for packaging of beer, soft drinks, juices, some alcoholic beverages);

Tubes (for packaging of pasty products, mayonnaise, mustard, spicy pasta);

Barrels (for packaging and transport of beer and wine);

Aerosol packages (sprays) (for packaging of flavouring substances, creams, whipped cream, sauces, etc.).

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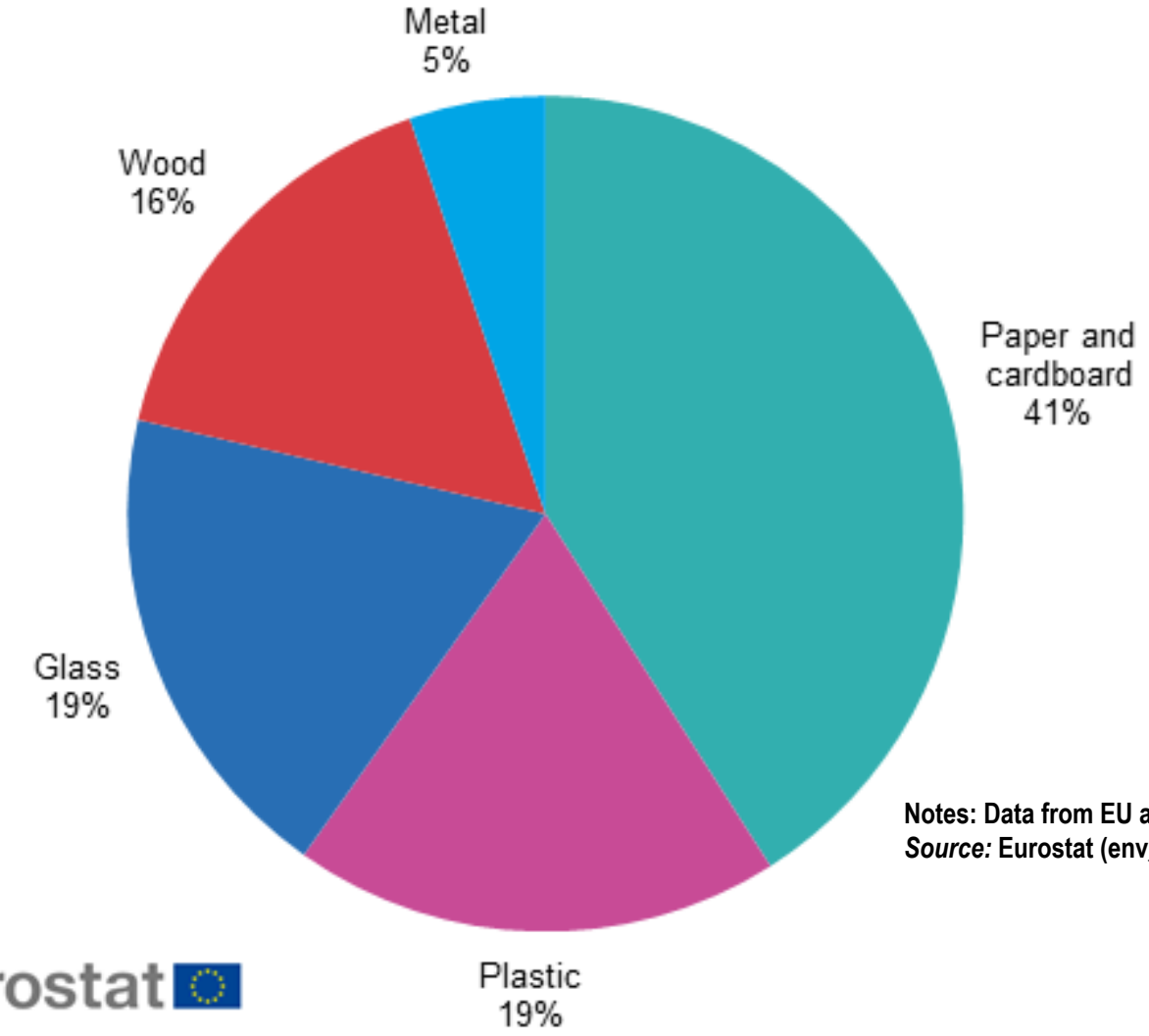
Packaging materials. Each flavour, its choice

PACKAGING WASTE GENERATED BY PACKAGING MATERIAL, EU, 2016

(%)



Notes: Data from EU aggregates have been estimated by EUROSTAT
Source: **Eurostat (env_waspac)**

eurostat

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Type of Packaging. The trade-offs

According to their scope, packaging can be distinguished in:

PRIMARY PACKAGING

SECONDARY PACKAGING

TERTIARY PACKAGING

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Type of Packaging. The trade-offs

PRIMARY PACKAGING
(sale packaging)

It is designed to contain, support or preserve the product throughout its lifetime.

Examples are: septic packages for dairy products, trays for fish or meat, bags for potato chips, cans for vegetables, containers for juices, flexible packaging, etc.

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Type of Packaging. The trade-offs

SECONDARY PACKAGING
(group packaging)

Packaging designed to constitute, at the point of purchasing, a grouping of a number of sales units.

May be sold to the consumer as a group or serve just as a means of filling shelves in the point of sale.

Secondary packaging can be separated from the product without affecting the product's characteristics.

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Type of Packaging. The trade-offs

TERTIARY PACKAGING
(transport packaging)

It is the packaging designed to facilitate the handling and transport of a number of sales units or grouped packages.

It is also intended to prevent damage of the products during transport from one economic operator to another.

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The EcoDesign approach. A successful project

Guidelines can be followed by designers to approach an **eco-sustainable project**.

Intent must be clear, sharp.

Five cutting-edge keypoints can be outlined.

Design to Reduce

Design to Reuse

Design to Renew

Design to Resolve

Design to Save

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Design to
REDUCE

Design to reduce. Minimize our impact

EcoDesigner must think at the packaging design by optimising its shape, size and weight.

He should address efforts to:

- Minimize the number of components/parts
- Remove from design all that is unnecessary
- Integrate functions
- Reduce to minimum the weight of single components optimizing performance and productivity

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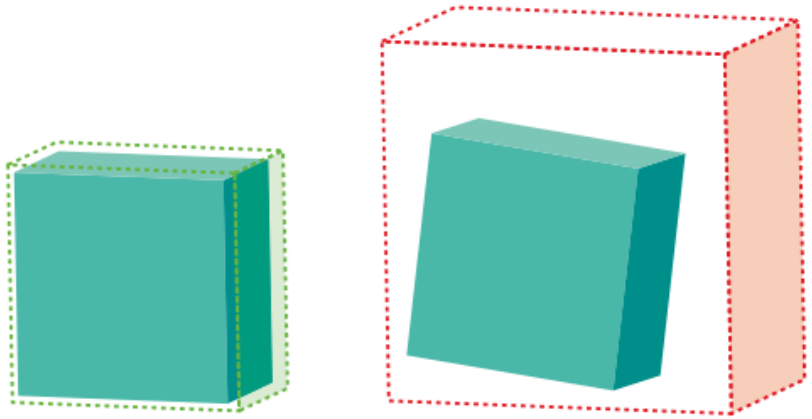
Design to reduce. Minimize our impact

This packaging optimization is carried out by:

- Reducing the packaging wall thickness
- Use effective structures to reinforce the packaging without increasing its mass
- Removing the spaces, layers and components not necessary
- Increasing the bulk density of the product by concentration (for some products such as: coffe, juices, detergents etc.)



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Overpackaging vs underpackaging. The correct choice

A balance between overpackaging and underpackaging needs to be found with regard to the protection of packed goods.

As packaging main function is to protect the goods, **under-packaging is usually far worse** for the environment than over packaging.

- Over-packaging by 10% means that 10% of the resources needed to produce the packaging are wasted, and extra fuel will be needed to distribute it.

- Under-packaging that results in the product being spoilt or damaged wastes 100% of the resources used to produce both the contents and its packaging, and all the fuel used to distribute it.

Ten times more energy and materials are locked up in household goods and food than in the packaging around them (Source: Dr J M Kooijman).

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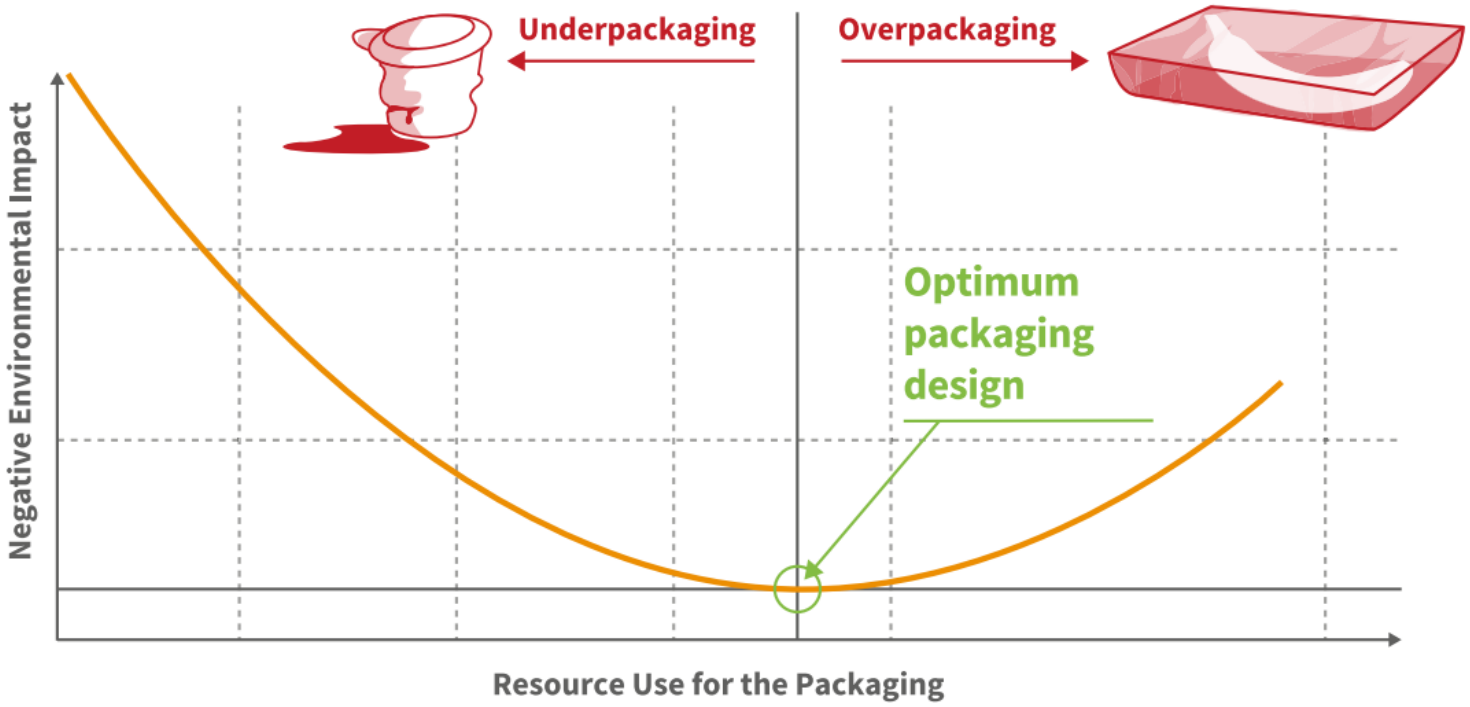
Overpackaging vs underpackaging. The correct choice

Under dimensioning and over dimensioning have a trade off.

A point of minimum impact can always be found. This is the task of the EcoDesigner by comparing different solutions.



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El poder de la colaboración

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PLASTICS INNOVATION POLE

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