



Advancing Sustainability of Process Industries through Digital and Circular Water Use Innovations

# AquaSPICE

WP8: Communication, Dissemination, Training and Social Awareness

AUDENCIA



The AquaSPICE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 958396.



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# CLEANER PRODUCTION

Industrial Environmental Processes



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- **Cleaner production:** also sometimes called pollution prevention (P2), is the continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency and reduce risks to humans and the environment

or

- Manufacturing processes that minimise environmental impacts (e.g. low use of energy and raw materials, low emissions and waste) through changes in production processes

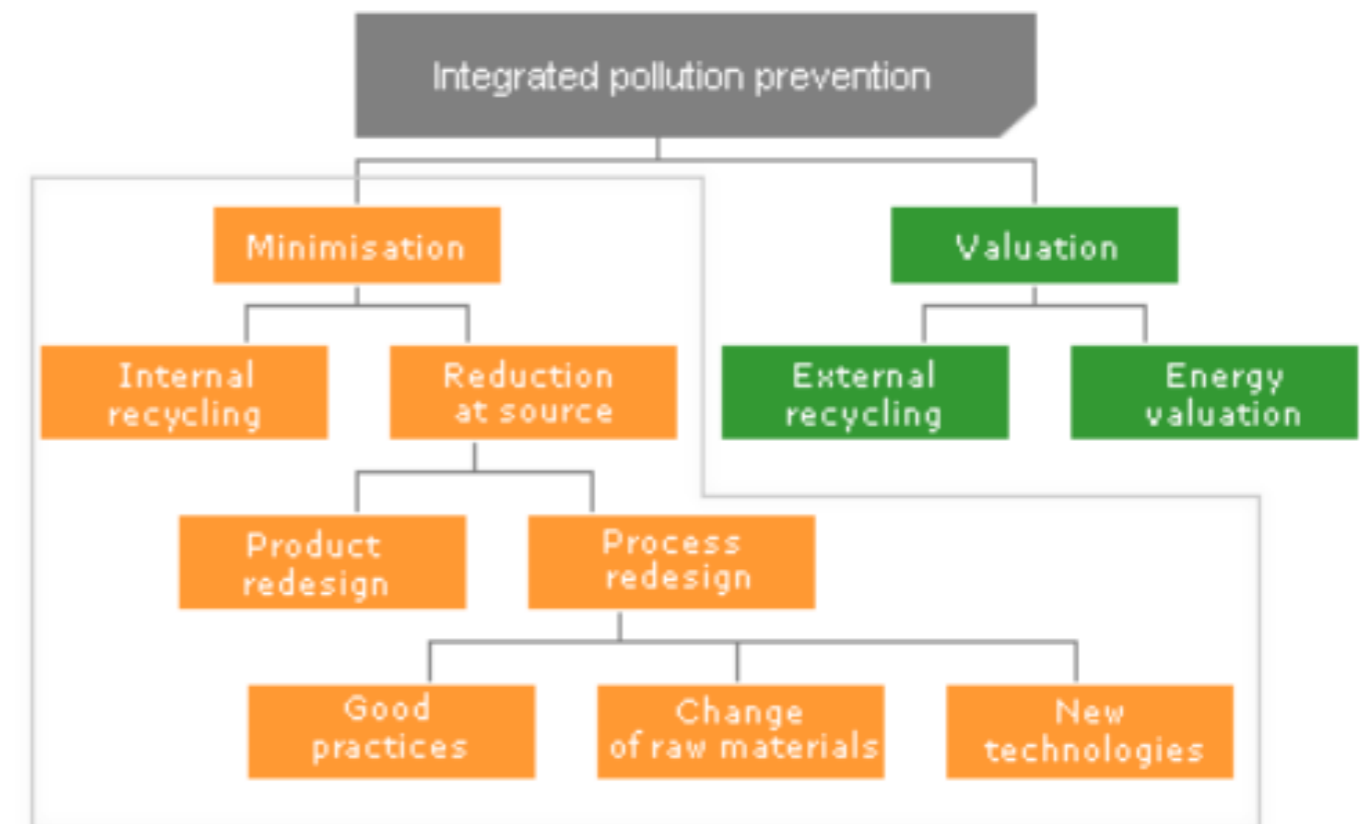
OECD, 2007, Business and the Environment: Policy Incentives and Corporate Responses, OECD, Paris.

For production processes, cleaner production involves one or a combination of the following:

- conserving raw materials, water and energy;
- eliminating toxic and dangerous raw materials;
- reducing the quantity and toxicity of emissions and wastes at source during the production process;

# How a cleaner production can be achieved?

- Cleaner production is an ongoing process that can be applied to production processes; products; or services; or it can be extended to cover the entire lifecycle of a product or service. Some cleaner production techniques include:
  - Changes in technology;
  - Changes in input materials;
  - Changes in operating practices;
  - Changes in product design;
  - Changes in waste use;
  - Changes in maintenance;
  - Changes in packaging;



- The ‘polluter pays’ principle is the commonly accepted practice that those who produce pollution should bear the costs of managing it to prevent damage to human health or the environment. For instance, a factory that produces a potentially poisonous substance as a by-product of its activities is usually held responsible for its safe disposal. The polluter pays principle is part of a set of broader principles to guide sustainable development worldwide (formally known as the [1992 Rio Declaration](#)).
- Source: LSE, [Grantham Insitute](#)
- Precautionary principle
- It explains the precautionary principle which enables a rapid response to be given in the face of a possible danger to human, animal or plant health, or to protect the environment.
- In particular, where scientific data do not permit a complete evaluation of the risk, recourse to this principle may, for example, be used to stop distribution or order withdrawal from the market of products likely to be hazardous.
- Article 3 of the United Nations Framework Convention on Climate Change (UNFCCC) establishes ***that “parties should take precautionary measures to anticipate, prevent, or minimize the causes of climate change and mitigate its adverse effects.”***

# Resource efficiency

Industrial life-cycle process

Environmental and social value=  
creating solutions



Internal efficiency

Reduces costs

Increases competitiveness



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# CONSUMER'S BEHAVIOUR

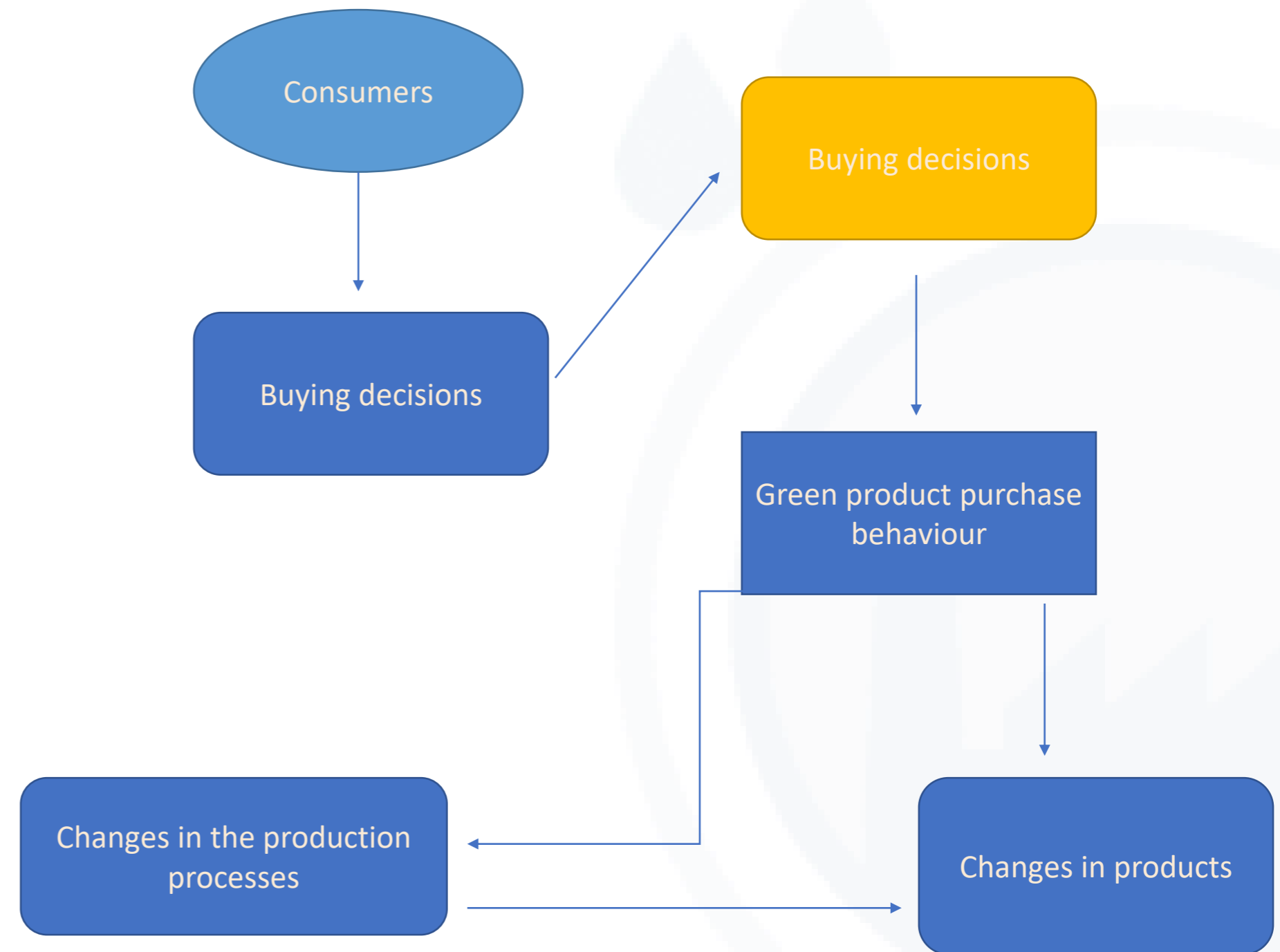
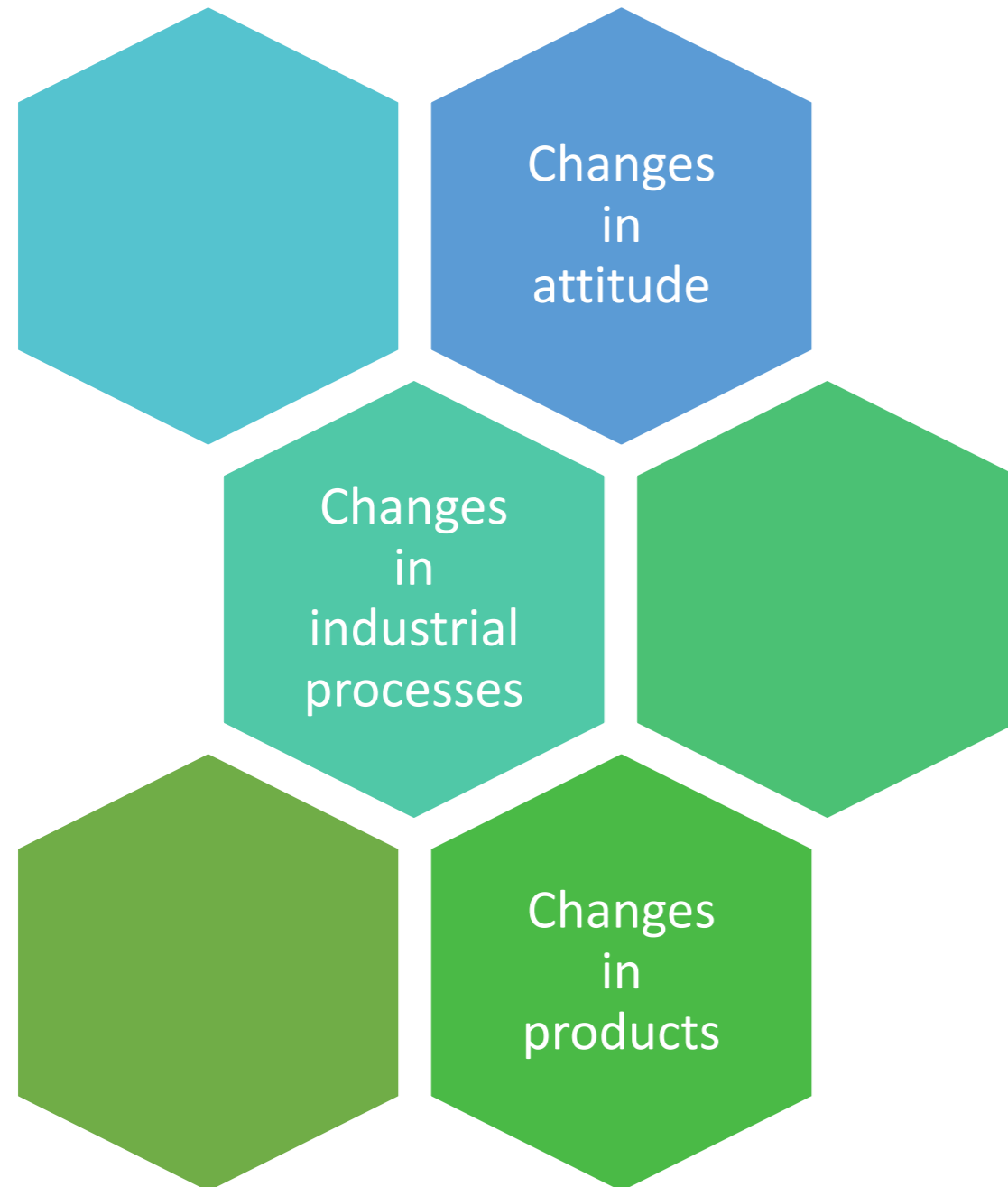
## GREEN PRODUCTS



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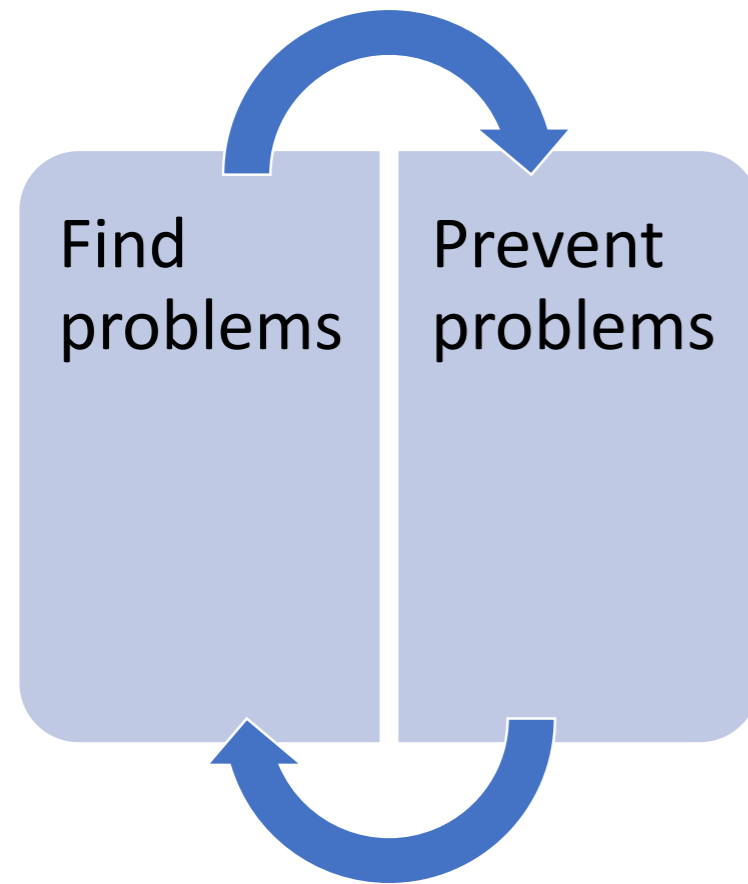
# Producers' & consumers' behaviour

How production processes become more green





# How companies adapt?



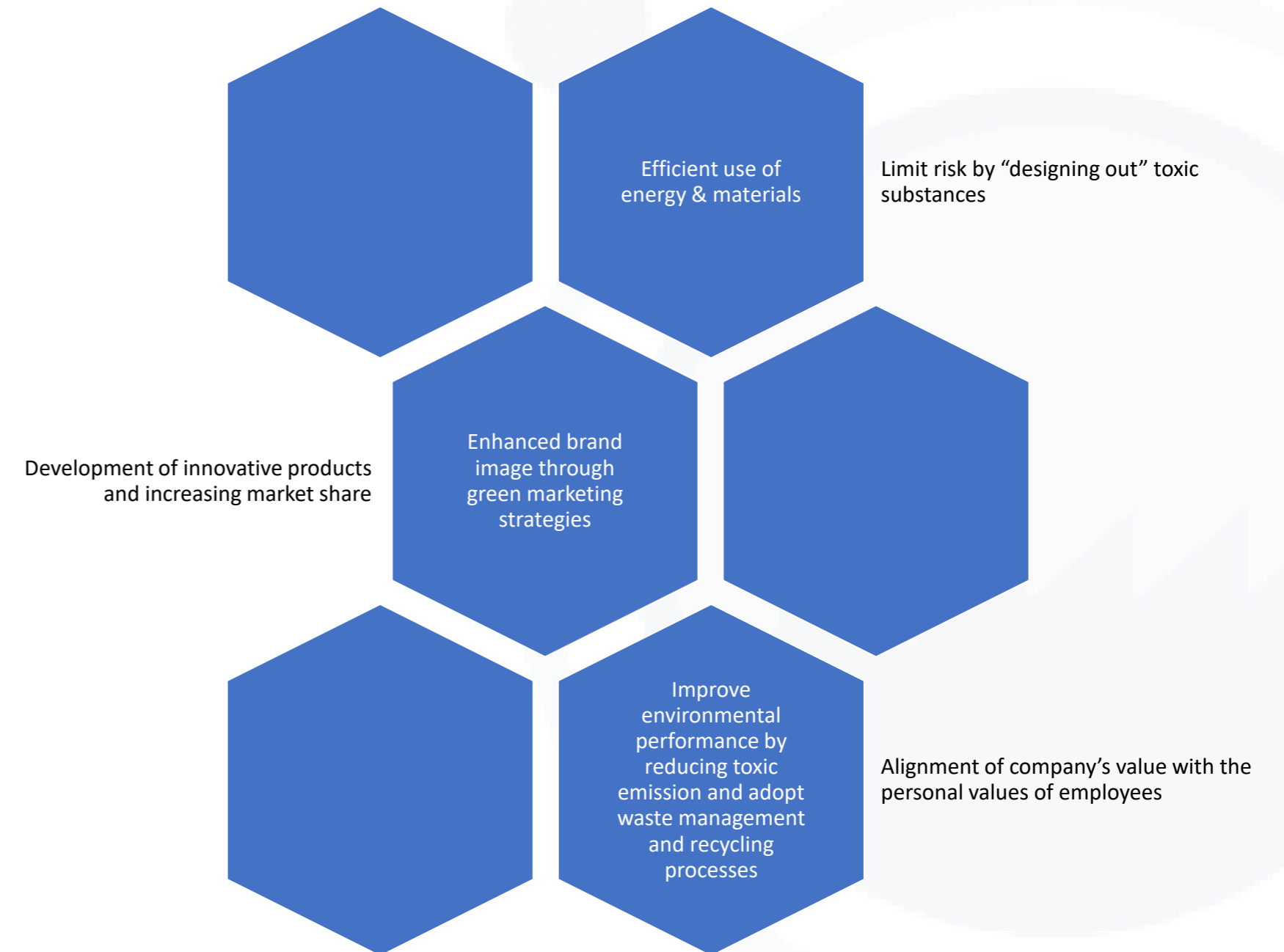
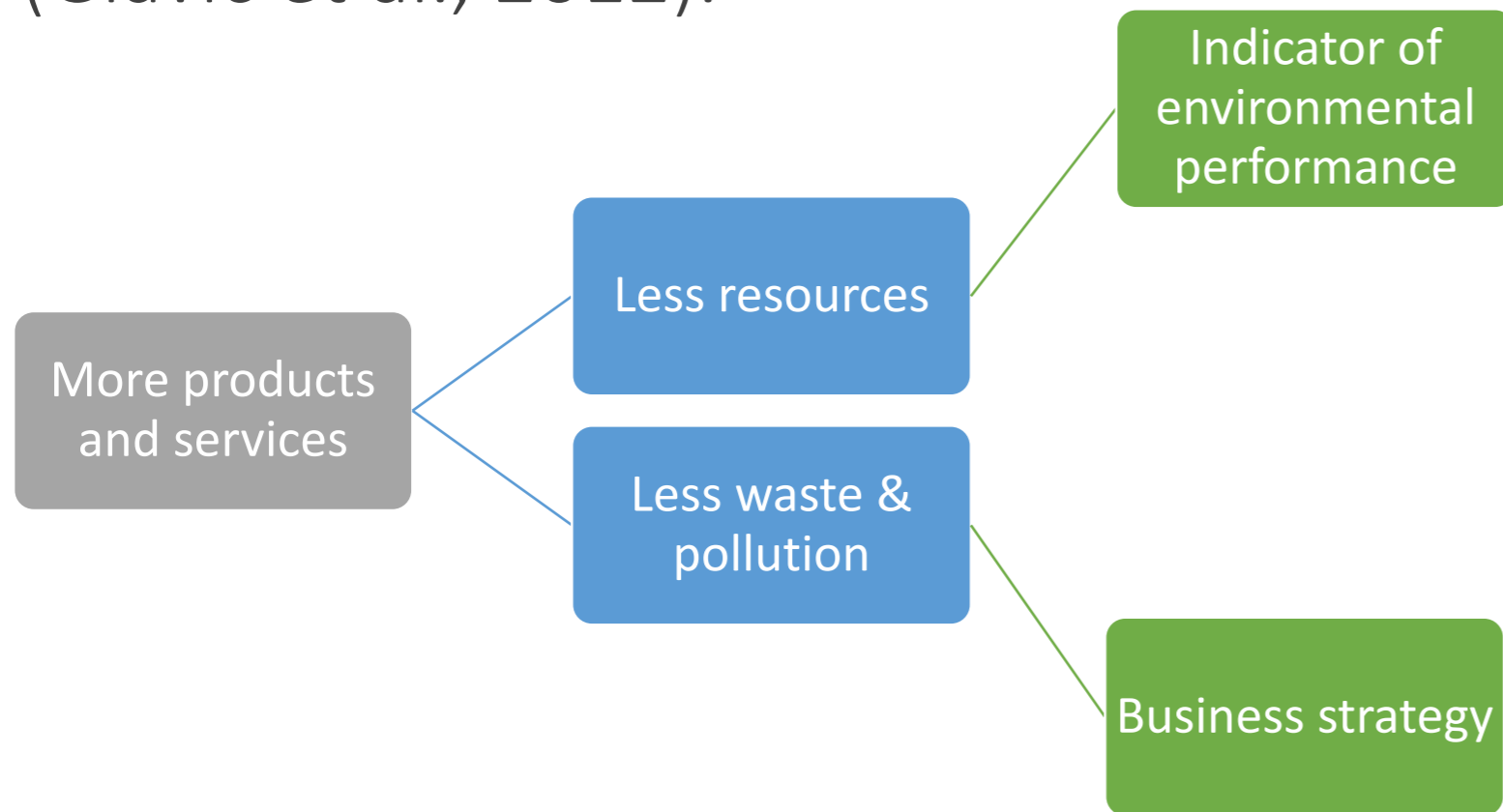
Look at the product design



Adapt their strategies

# Eco-efficiency

- Eco-efficiency: Eco-efficiency is a management strategy of doing more with less (Glavič et al., 2012).



The integration of environmental aspects into the product development process, by balancing ecological and economic requirements. Eco-design considers environmental aspects at all stages of the product development process, striving for products which make the lowest possible environmental impact throughout the product life cycle.

Fewer materials & energy

Use of bio-materials

Recyclable materials



**IBERDROLA**

### The benefits of ECO-DESIGN

- HIGHER QUALITY PRODUCTS**  
Eco-design products are **more versatile** and are manufactured with longer-lasting materials.
- MORE SUSTAINABLE INDUSTRIES**  
Companies benefit from **innovation** and become more committed to the environment.
- HAPPIER CONSUMERS**  
Consumers' needs are met with **more attractive products** that satisfy an increasingly demanding public.
- MARKET DIFFERENTIATION**  
Sustainable products have **added value** that gives them an edge over competitors.
- FEWER EMISSIONS**  
They consume less energy during transport for lower **CO<sub>2</sub> emissions**.
- MORE EFFICIENT PRODUCTION**  
They **save energy** and require fewer natural resources and raw materials.

Source Euro-Funding.

Long-lasting

Reusable

Innovative

Green marketed

Video projection: <https://www.youtube.com/watch?v=Sf78ov299u4>

<https://youtu.be/7gTdyh8ejQw>

# Advantages-disadvantages

- Advantages of eco-design:
- The potential benefits of using eco-design include:
  - ✓ labour costs and greater efficiency
  - ✓ reduced material and resource costs
  - ✓ lower waste disposal costs
  - ✓ improved functionality and quality of products
  - ✓ increased market share
  - ✓ improved environmental performance
  - ✓ improved customer and supplier relationships
  - ✓ easier and lower cost of compliance with legislation
  - ✓ easier disassembly and increased potential for recycling
  - ✓ most suitable product design life
  - ✓ a better working environment and business culture for your staff

## Barriers:

- ✓ consumers' low level of understanding of eco-design
- ✓ higher purchasing cost
- ✓ difficulties to clearly demonstrate the benefits to buyers so that they choose your product
- ✓ risks of trying new materials and approaches
- ✓ difficulties using ecodesign on mainstream products instead of just high quality and niche products
- ✓ targeting the right stage in the product's lifecycle or supply chain so you get the greatest environmental paybacks for your investment
- ✓ integrating principles across business approaches and supply chains where the opportunities can be greater than singling out 'eco-products', which in some cases don't succeed

- Life-cycle assessment (LCA) is a process of evaluating the effects that a product has on the environment over the entire period of its life thereby increasing resource-use efficiency and decreasing liabilities. It can be used to study the environmental impact of either a product or the function the product is designed to perform. LCA is commonly referred to as a "cradle-to-grave" analysis. LCA's key elements are:

**(1)** identify and quantify the environmental loads involved; e.g. the energy and raw materials consumed, the emissions and wastes generated;

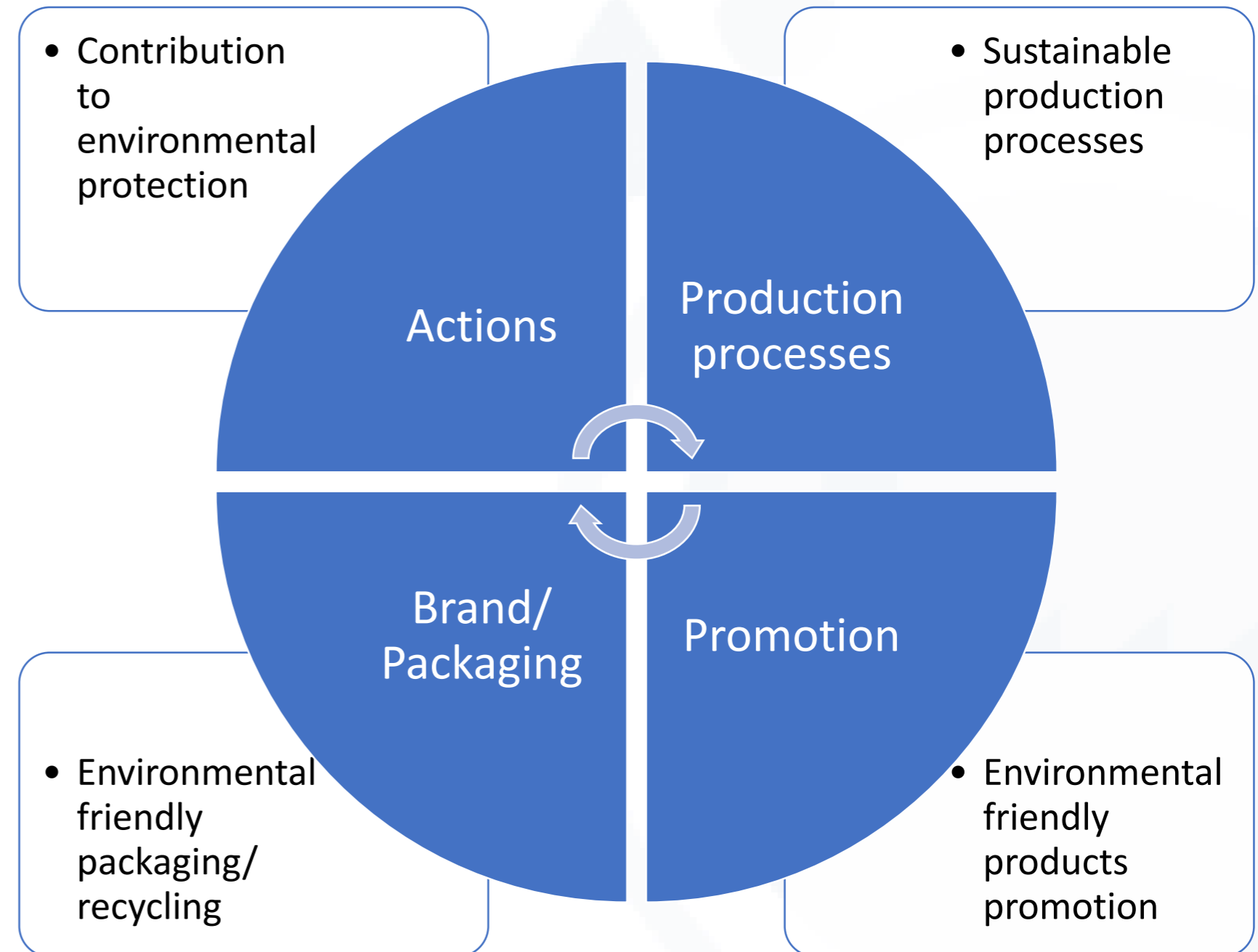
- (2)** evaluate the potential environmental impacts of these loads; and

- (3)** assess the options available for reducing these environmental impacts.

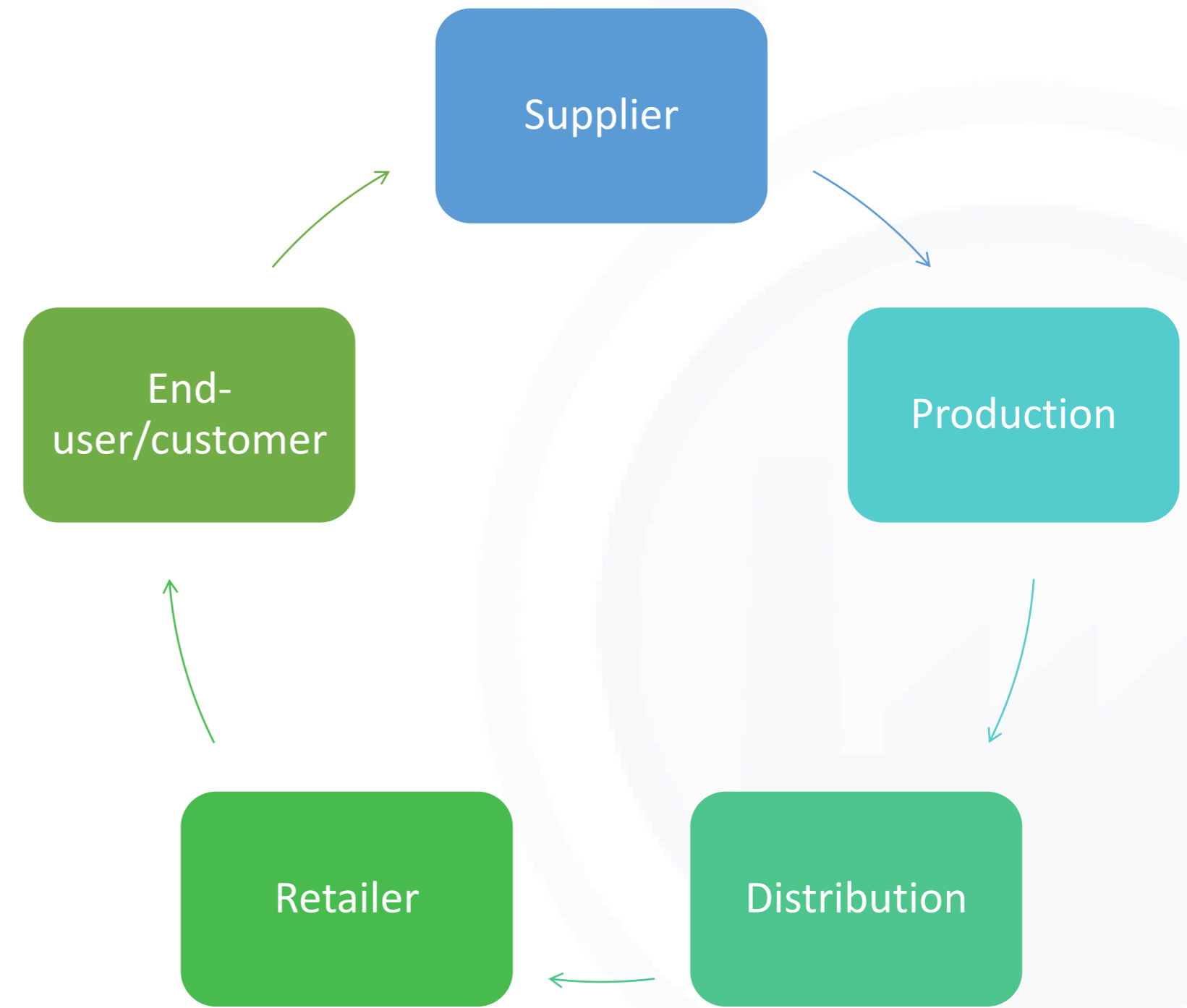
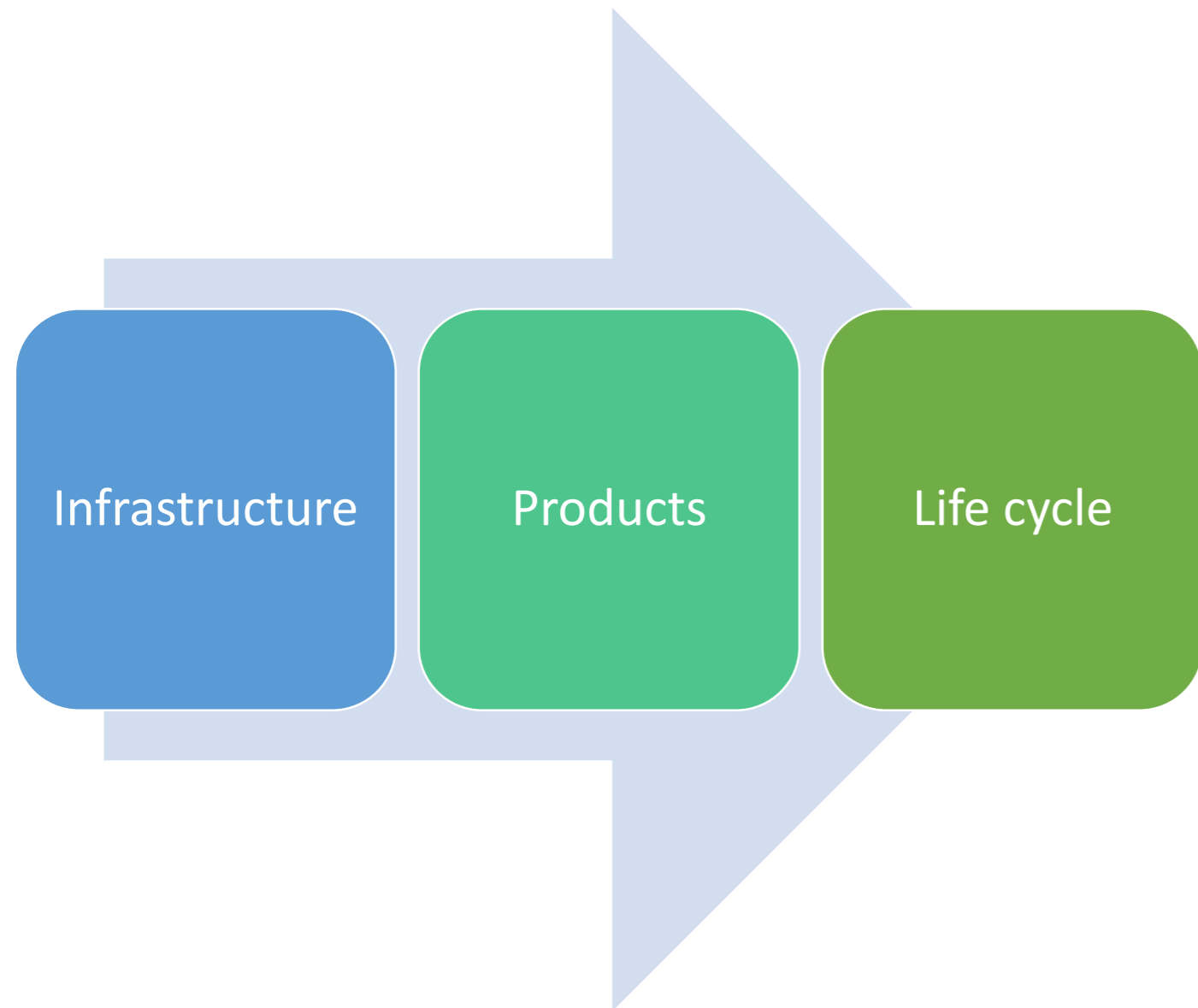


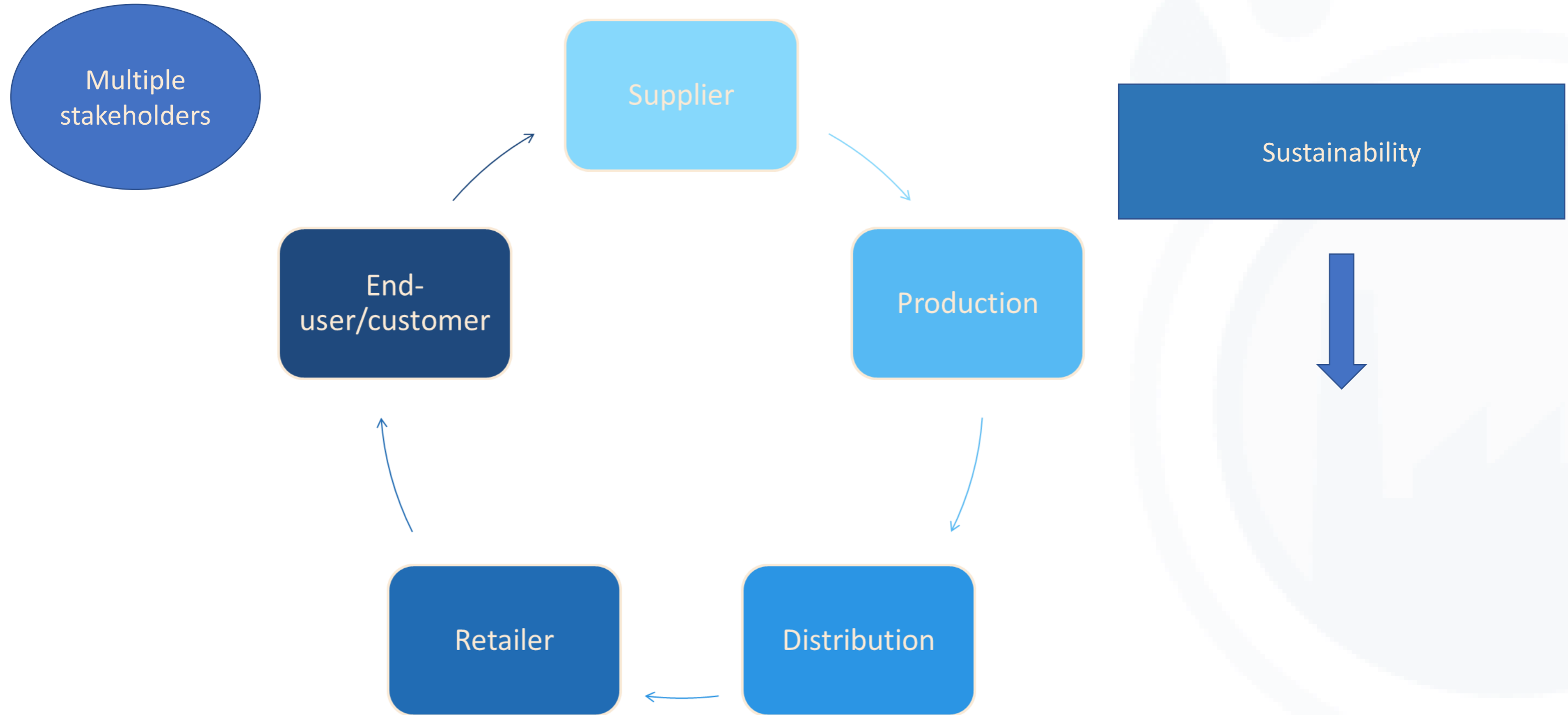
# Green marketing

- Green marketing mix refers to green product development and the execution of pricing, promotional and distribution, which is specifically aimed at promoting or preserving environmental welfare (Kinoti, 2011).



- Corporate Responsibility







# INTERNATIONAL STANDARDS



The independent industry textile standard

Ethical Trading Initiative



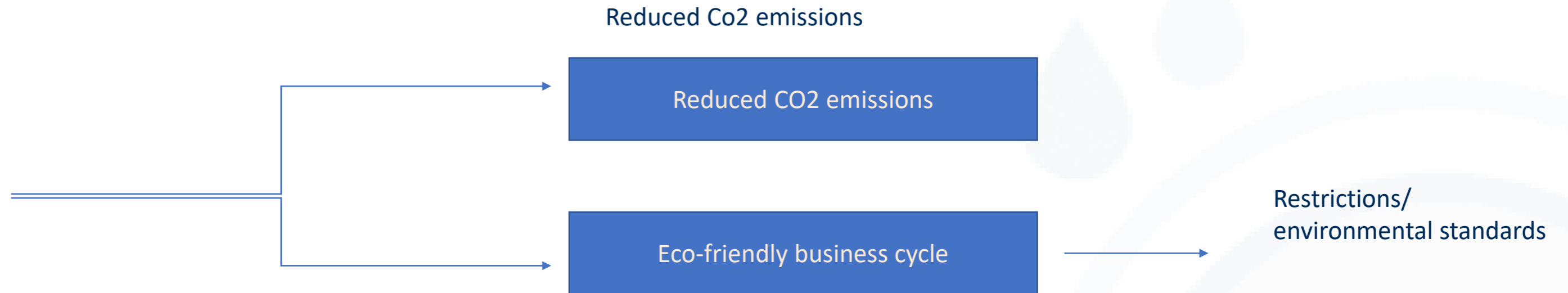
Company

Forest Stewardship Council



Non-profit





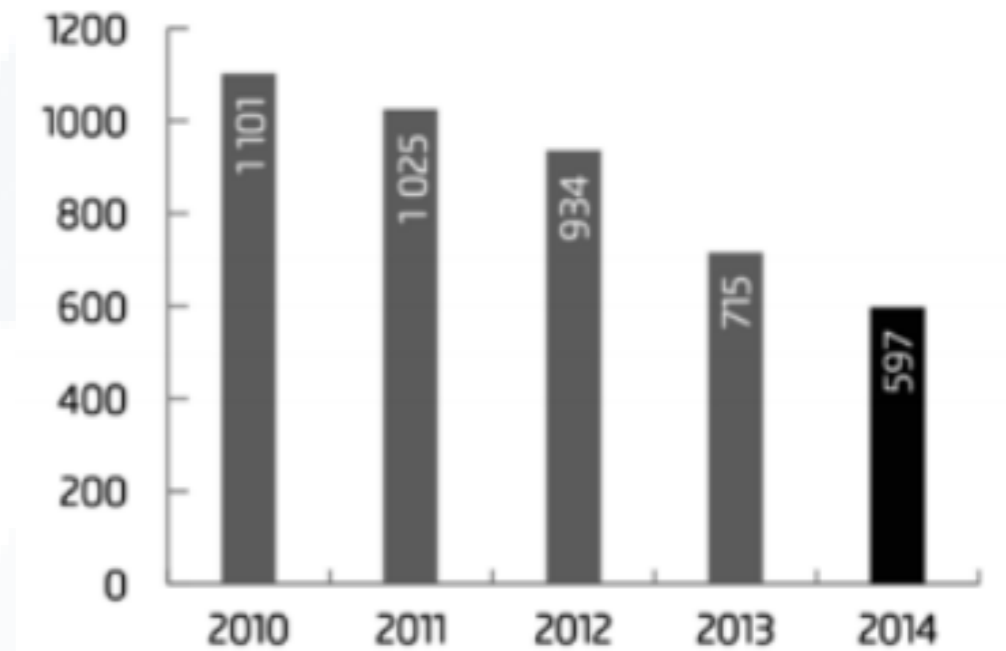
## ■ Being green

- The automotive industry should follow a full-cycle life management:
  - Buying green resources;
  - Practice green production processes & logistics;
  - Save natural resources;

# RESTRICTION ON THE AUTOMOTIVE INDUSTRY:

- EU regulation is Euro VI, the latest emission standard covering all types of vehicles produced after August 2015 – passenger cars (category M), light commercial vehicles (category N1) and trucks, and buses (Cummins 2017).
- The European Strategy for Low-Emission Mobility was appointed with the main aim to „make an important contribution to modernizing the EU economy, helping to reduce emissions from the transport sector and meeting the EU’s commitments under the Paris Agreement“. (European Commission 2016, p. 13).
- Practices that the car industry should follow:
  - Waste reduction.
  - Developing products that protect/ do not damage the environment.
  - Ecological solutions for the current products.
  - Transformation and improvement of the production process.
  - Development of a relationship with suppliers (sustainable processes and supply chain).
  - Controlling the product impact (whole production chain).
  - Using renewable energy sources. (Přikrylová, Jaderná, 2016)

- In the context of these facts the Green Future strategy is focused on savings in manufacturing, on the development of green products, and on providing green services/CRS activities.
- The Green Future strategy is divided into 3 main areas:
  - 1. Green Factory= energy savings/ water saving
  - 2. Green Product= reduced of CO<sub>2</sub> emissions linked to the production generating 539 thousand tons of CO<sub>2</sub> emissions every year, and to the production of CO<sub>2</sub> by a fleet of million ŠKODA Octavia in use.
  - 3. Green Retail= recycling of old Skoda cars and reuse in the production process (85% recyclable)
- CSR activities:
  - - Educational programmes for car traders;
  - - Eco-behaviour project „One tree planted for each car sold in the Czech Republic”.
  - - SKODA AUTO proclaims its green attitude in „Extended producer responsibility”. Old car owners can leave their cars for environmental friendly recycling



- Life-cycle production process & employees involvement in environmental processes
- Achievements:
  - eco-designing products with the use of fewer material and fewer natural resources;
  - eco-friendly supply-clean production;
  - recycling rate of 95% with recycled material in production processes; recycling of raw material (steel, copper, textiles, noryl and polypropylene)
- CSR strategies: ECO2 Driving programme helps drivers to reduce their eco-impact= 25% of reduced CO<sub>2</sub> emissions.



## Suppliers



### Code of Conduct:

- Legal Compliance
- Occupational Health
- Safety
- Workers' rights
- Environment

## Political decision-makers



- Political dialogue with decisions-makers in Bangladesh
- Employment wages

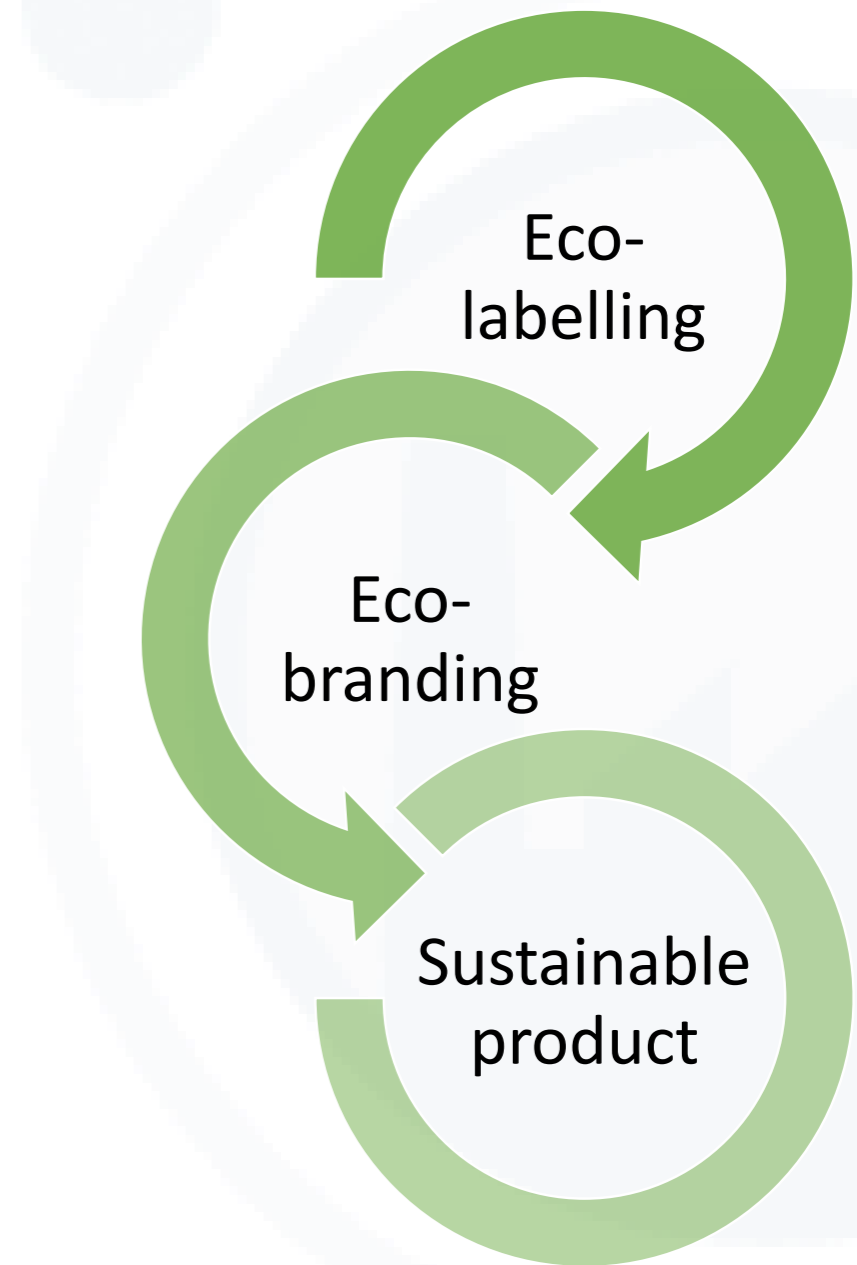
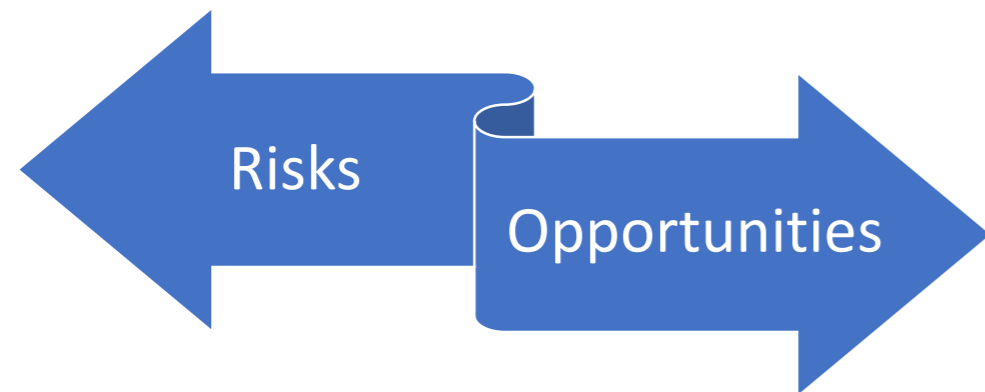
## Environmental consequences



- Use of cotton:
- Sustainable farming practices

- Business influence on consumers' behaviour:

- Influence choices;
- Priming (brand priming)
- Location of products



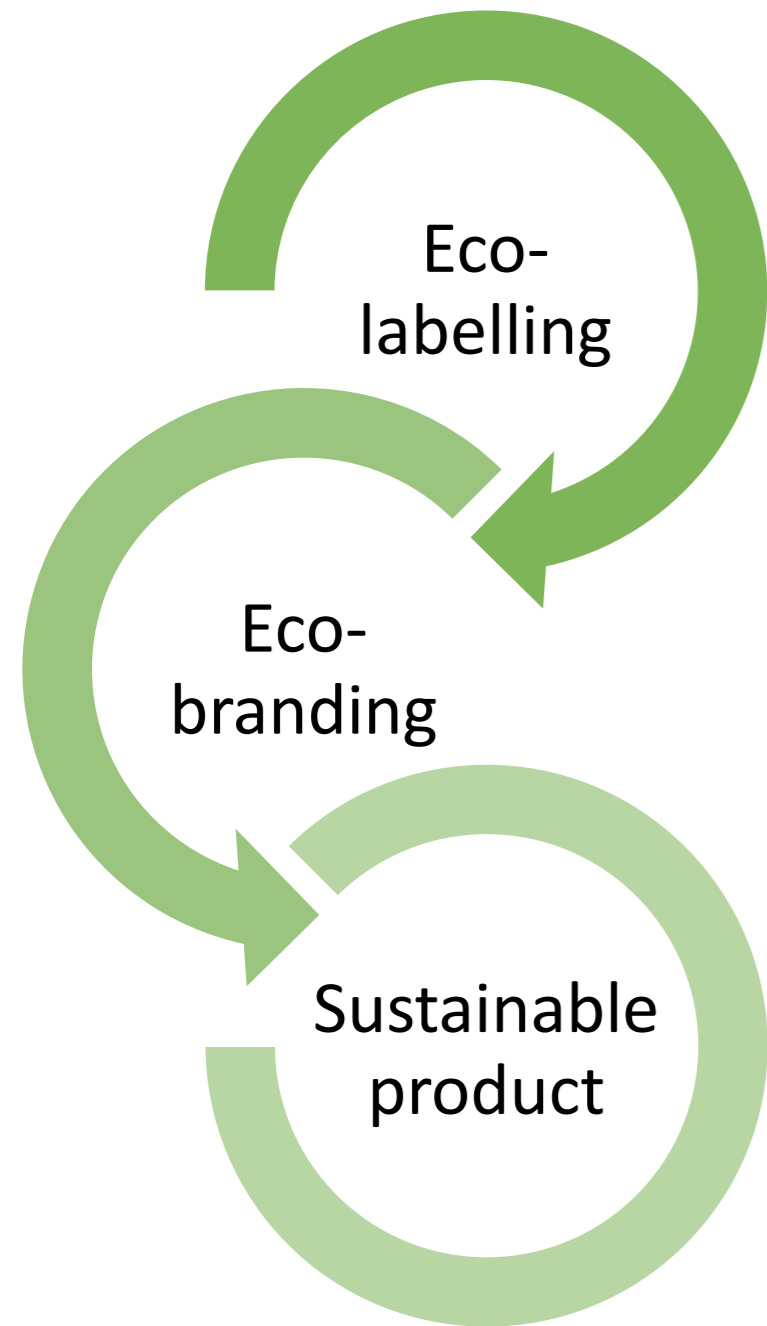
# Eco-labelling

- **Ecolabelling:** is a voluntary method of environmental performance certification and labelling that is practised around the world. An ecolabel identifies products or services proven to be environmentally preferable within a specific category. = certified on a science based standard and meets transparent environmental leadership criteria based on life cycle considerations
- Source: <https://globalecolabelling.net/>

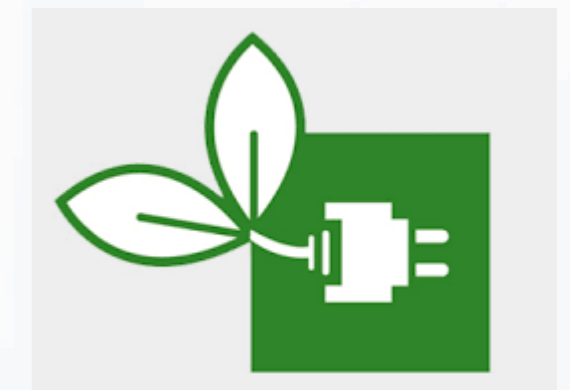
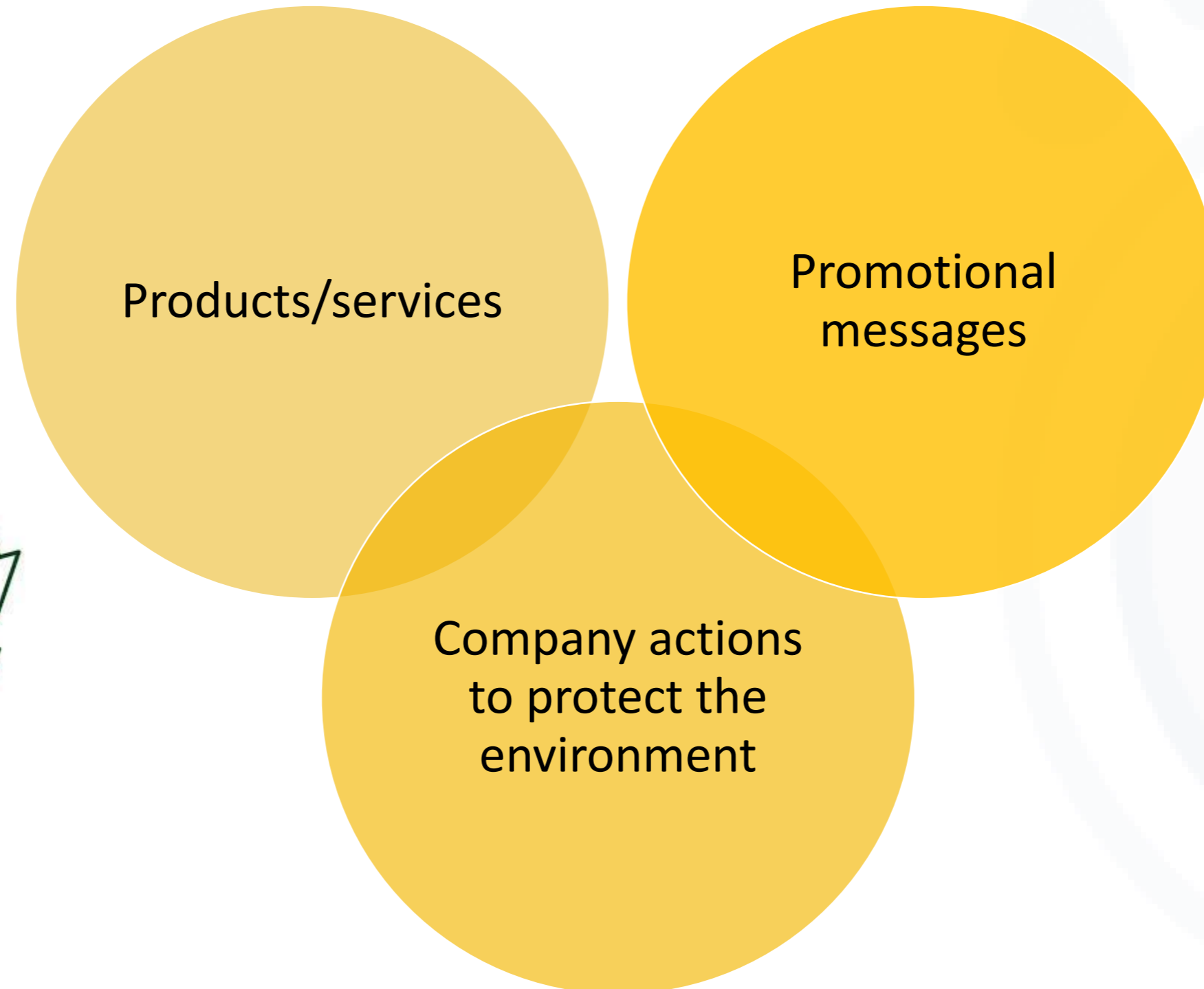




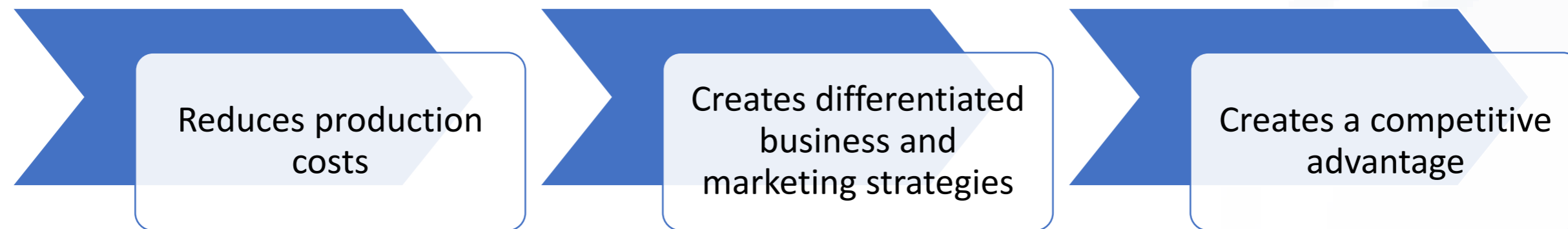
# Eco-labelling



# Eco-branding



- Companies tend to create their own eco-products which fit into “best-in-category” products under private eco-brands:



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