

Unit 2.1 Eco-design highlights

Content

2.1.1 Concept

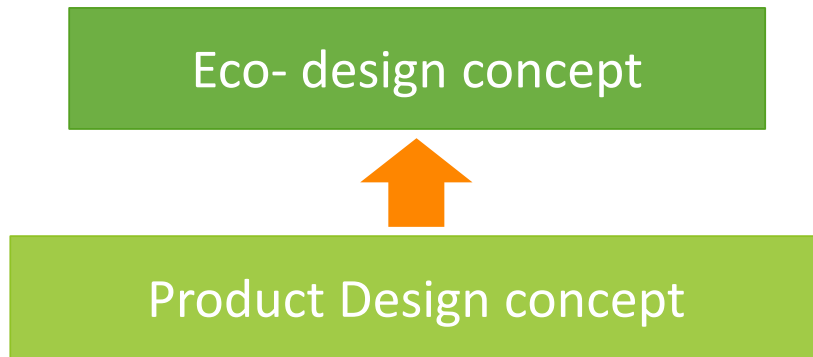
2.1.2 Benefits

2.1.3 EU Regulations

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.1 Concept: Introduction to eco-design

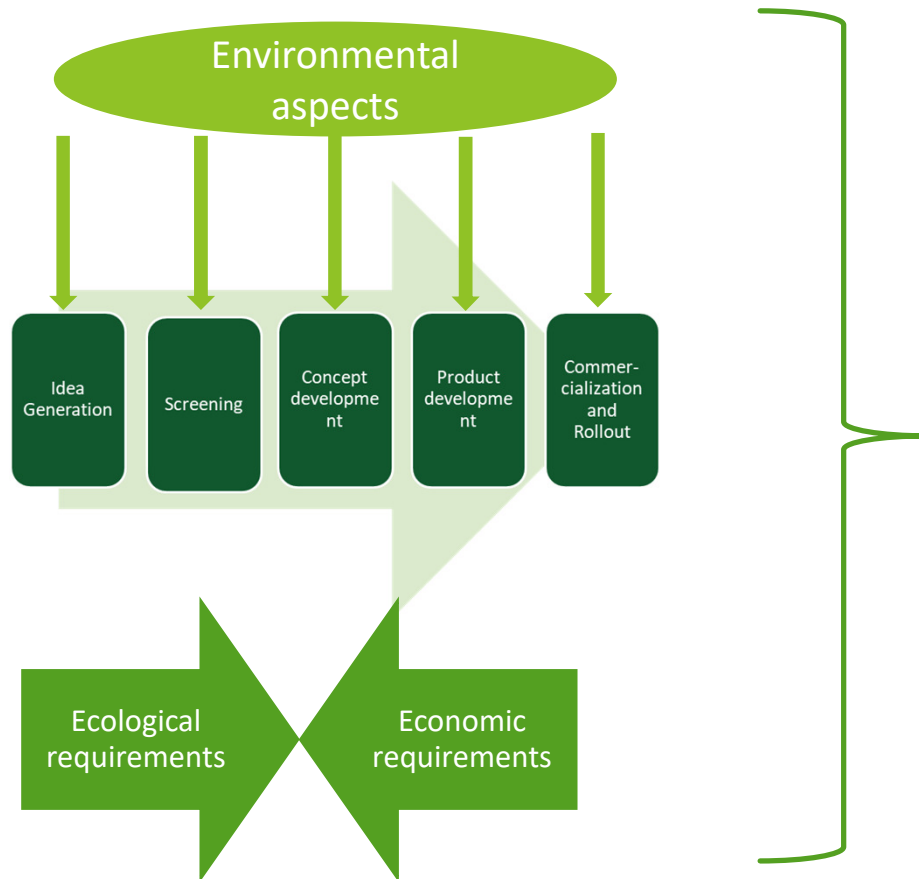


- ▶ Eco-design has its basis on product design concept
- ▶ Different environments affect the process
- ▶ Eco-design concept is a new method of product design
- ▶ Multi-faceted
- ▶ Different aspects to consider
- ▶ Designers need to think more than *making a design*
- ▶ Realise impactful changes from manufacturing and designing processes

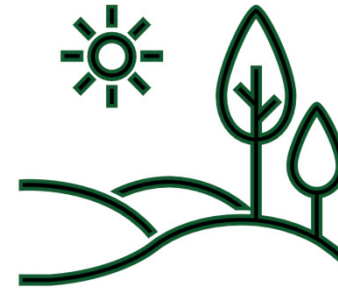
MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.1 Concept: Eco-design definition^{1,2}



Products with the lowest possible environmental impact throughout the product life cycle



MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.1 Concept: Introduction to eco-design³

Sustainable design
Environmental and conscious design
Life-cycle and life-cycle engineering design
Clean design



MODULE 2 Eco- design for circular economy
Unit 2.1 Eco-design highlights

2.1.1 Concept: Examples of eco-design concept³



▶ Fewer materials



▶ Innovative



▶ Easy to recycle



▶ Multipurpose, reusable and recyclable



▶ Use bio- materials



▶ Lowering emissions



▶ Green message



▶ Long lasting

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Unit 2.1 Eco-design highlights

2.1.1 Concept: Aspects that affect³

Industry aspect

Product requirements?
Will external expertise be required?
Important elements being forgotten?
Launching of products?
User friendly?
Time saving development process?
Affordable?

Environmental impact aspect

Product requirements?
Environmental product legislation requirements?
Launching of products?
Launching of products?
Time saving development process?
Acceptable?

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.1 Concept: Aspects that affect



MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.1 Concept: Indicators that set an eco-design⁵

Measuring

- ▶ Resource-use efficiency
- ▶ Impact of economic activities on the environment

Taking into consideration

- ▶ Environmental aspect
- ▶ Social aspect
- ▶ Economic aspect

Measuring the immeasurable?

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Unit 2.1 Eco-design highlights

2.1.1 Concept: Indicators that set an eco-design

1. *Measure the eco-efficiency of different sectors within the country*
2. *Compare the eco-efficiency of economic growth of different countries*
3. *Identify policy areas for improvement in achieving economic benefit*
4. *Track trends in eco-efficiency over time.*⁵

Eco-efficiency

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Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability

Principles in eco-design can be applied to the fashion industry

New business models that increase clothing use

Safe and renewable inputs

Solutions so used clothes are turned into new

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability



The 2 types of fashion

Fast fashion



Slow fashion

2.1.1 Concept: Fashion design and sustainability

Table 1. Comparison between some significant concepts of Fast and Slow approaches applicable to Fashion production [10].

Fast Mindset	Slow Mindset
Mass-production	Diversity
Globalisation	Global-local
Image	Sense of self
New	Making and maintaining
Dependency	Mutual trust
Unaware of impact	Deeply connected with impacts
Cost based on labour and materials	True price incorporating ecological and social costs
Large scale	Small to medium scale

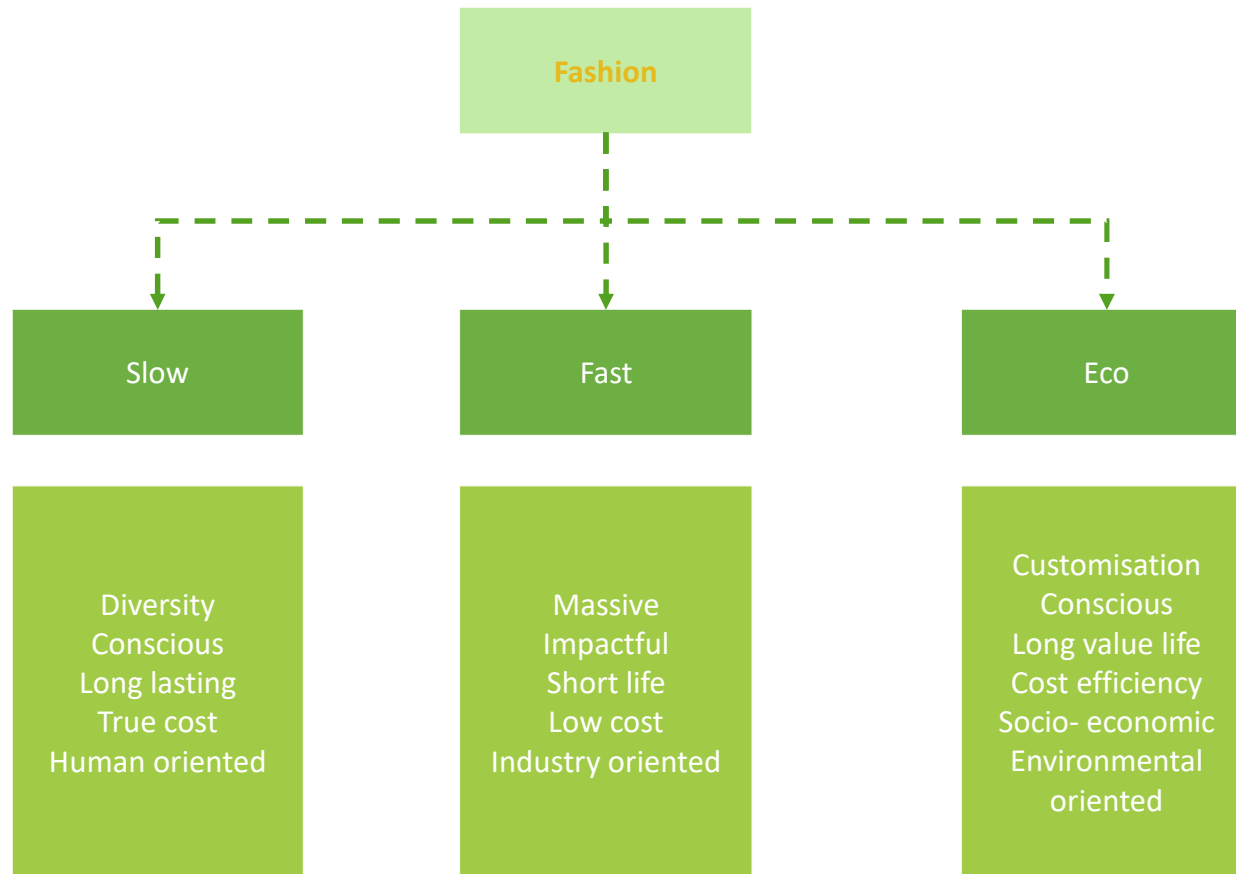
Figure 1: Comparison of fast fashion and slow fashion⁴

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Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability

The 3 types of fashion



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Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability⁶

The fashion industry today:

- ▶ Industry's worth values at 1.3 trillion USD
- ▶ Holds an amount of 300 million people employed
- ▶ Uses more than 60% of textiles for clothing
- ▶ Clothing use has declined

New models are
introduced

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Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability

New models to increase clothing
use

Inputs that are eco-friendly and
renewable

Solutions to reconstruct old
clothes

New models are
introduced

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability

Common *applications* of the new era are:

- ▶ Reuse (both)
- ▶ Recycling (manufacturer and consumer)
- ▶ Remanufacturing (manufacturer)
- ▶ Upcycling (both)



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Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability

Keep clothes in use

- ▶ Produce clothes of higher quality
- ▶ Develop new business models
- ▶ Provide durable products
- ▶ Reflect real economic cost on product's price

Repair

Resale

Rent

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Unit 2.1 Eco-design highlights

2.1.1 Concept: Fashion design and sustainability

Close the loop

Enable the reuse and recycling of materials

The zero waste philosophy should be applied at all times

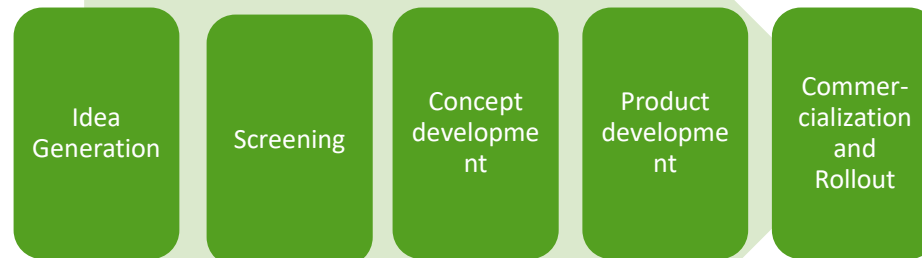
Reduce consumption needs through prolonged life of use

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Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in product development

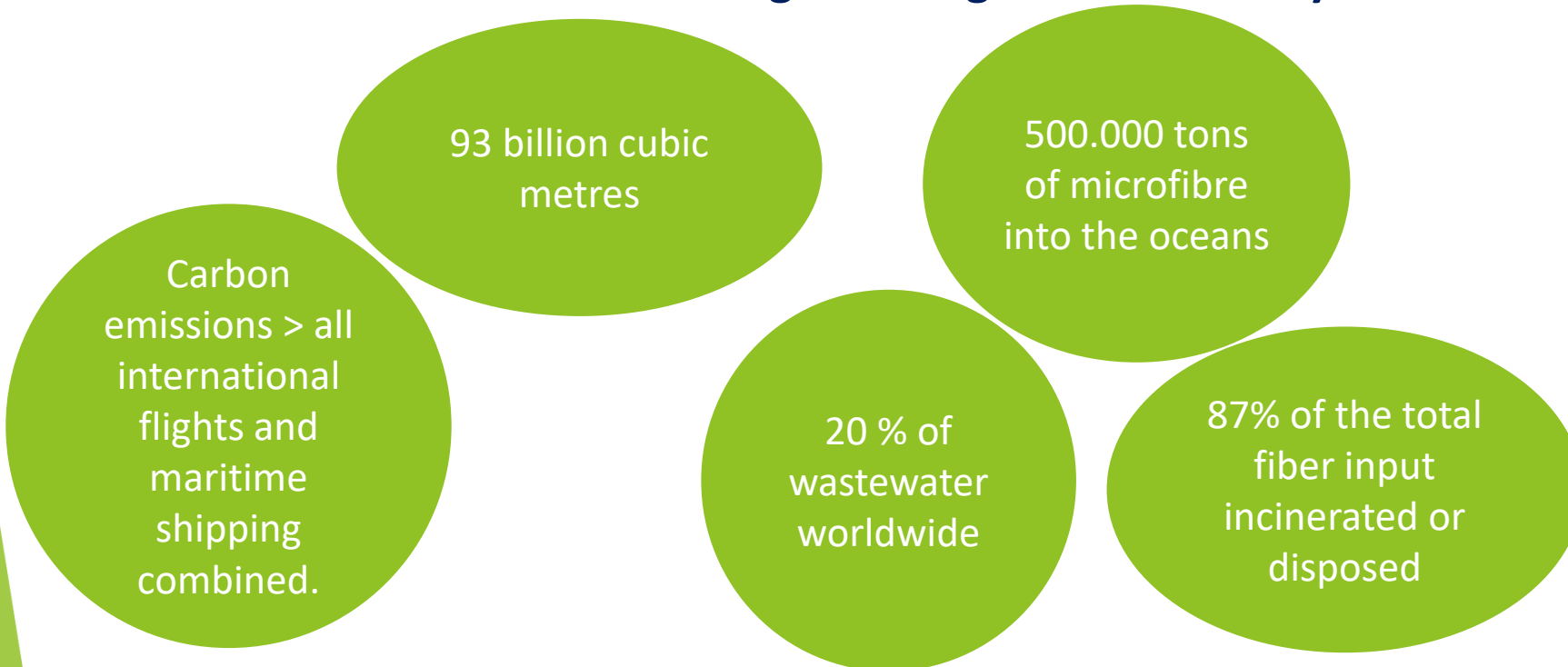
Product development: The procedures through which an idea becomes a commercial product.⁷



Eco-design for circular economy

Unit 2.1 - Eco-design in Product Development

2.1.2. The need behind eco-design in the garment industry^{8,9}



MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in product development¹⁰



MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in product development

Success factors

taking the environment into account from the very first phases of the product development process

defining a clear eco-design strategy

putting together a cross-sectional and multi-disciplinary team (marketing, sales, production, design)

training stakeholders and raising their awareness of the environment

supporting stakeholders throughout the process

2.1.2 Benefits: Eco-design in product development

OBSTACLES

Potential increase in product cost

Increased development time, human and financial investments and therefore associated costs

Changes in company policy or regulation, which can lead to evolving specifications

Insufficient knowledge of the environment

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in product development¹¹

- ▶ Fewer materials
- ▶ Easy to recycle
- ▶ Use of bio-materials
- ▶ Long-lasting
- ▶ Multipurpose, reusable and recyclable
- ▶ Lowering emissions
- ▶ Innovative
- ▶ Green message

**Impact of eco-design approach
on product characteristics**

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in product development¹²



Quantitative (complex)

- LCA (several integrated software)
- S-LCA (Life cycle assessment social)



Qualitative (simpler)

- 1) Matrices, 2) network diagrams or polar, 3) lists of strategies, 4) checklists
- MSDP (Method for sustainable product development), SDO Toolkit (Sustainable Design Orienting Toolkit)

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Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability

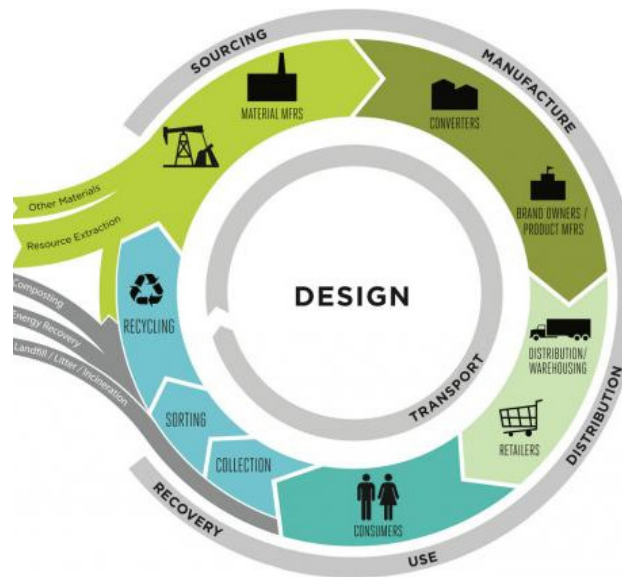
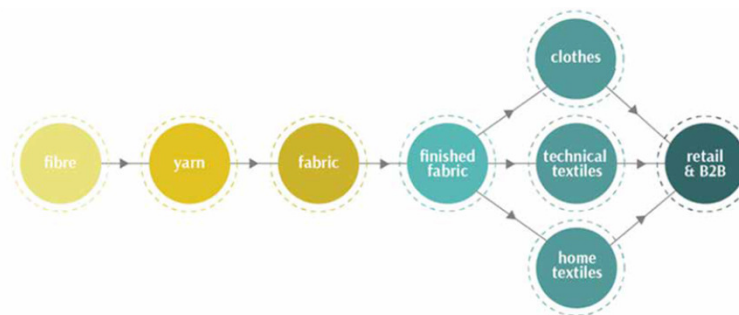


Figure 2: The circular model¹³

Products in the circular economy

- ▶ The Linear and Circular Model¹⁴
- ▶ Trends and their implications on product design¹⁵
- ▶ Focus on product



MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability

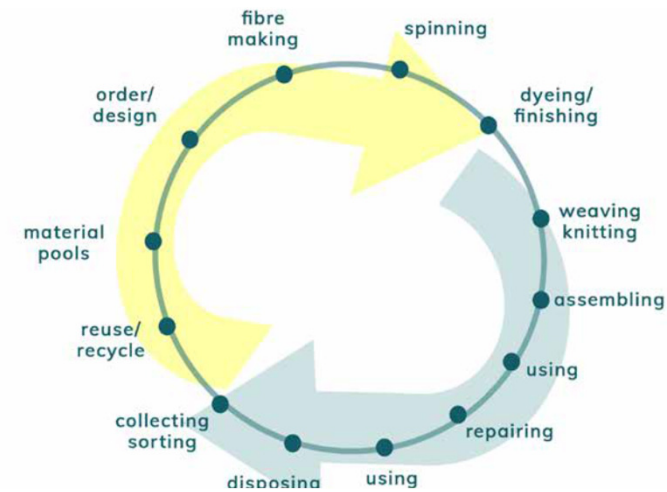


Figure 3: ECOS organization circular textiles¹⁸

Figure 4: Circular textiles¹⁹

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Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability

Internal Drivers/ Barriers from the business itself

External Drivers/ Barriers mainly from legislation

Environmental awareness is emerging in Europe, and anxiety about the environmental influence of textile factories in lower cost countries is increasing.^{15,19}

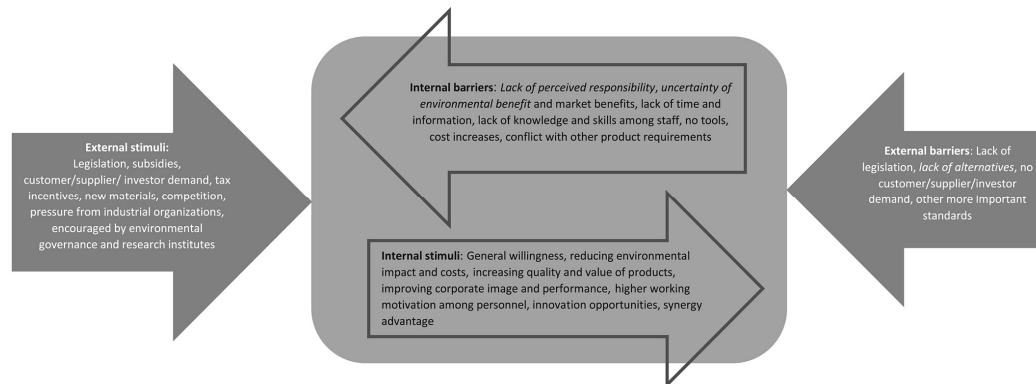


Figure 5: Circular textiles²⁰

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Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability

The environmental footprint of textiles.

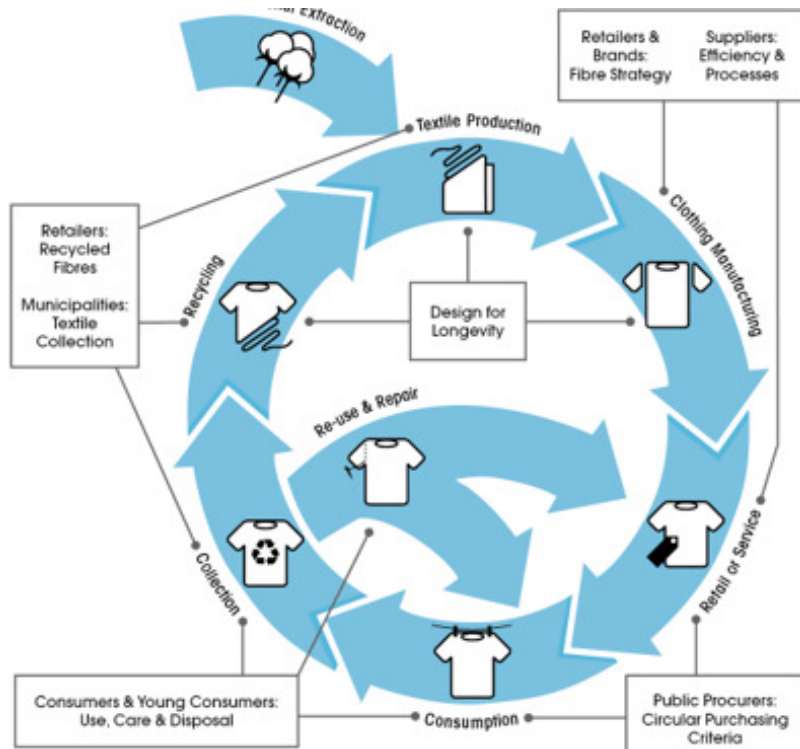
Customer must be properly educated and end-users must be persuaded to select environmentally sustainable products. Currently a minority of customers are interested in eco-textiles and eco-clothes and in general they are very interested about green products, but for most the price, the quality and the esthetical considerations are affecting their decisions



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Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability



Application of Eco-Design Principles^{22,23}

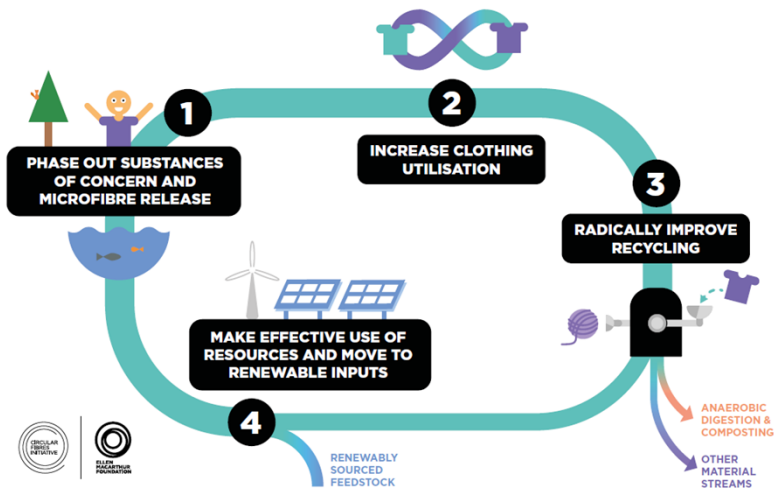
- ▶ Interdisciplinarity and education, both during professional education and in life-long-learning programs.
- ▶ Curricula with strong sustainability focus
- ▶ Focus on sustainable material choices
- ▶ Propose designs that are timeless, durable and easy to repair
- ▶ Evaluate the manufacturing, packaging and maintenance process
- ▶ Have incentives within a company to design for circularity
- ▶ Have management support

Figure 6: Design in longevity

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability



Approaches and Guidelines

- ▶ Design for Sustainability (www.d4s-sbs.org)
- ▶ Design for Recycling and Disassembly
- ▶ Zero waste pattern cutting
- ▶ Design for Longevity

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability

The Jeans Redesign Guidelines (Ellen MacArthur Foundation, 2019) set out minimum requirements to ensure jeans last longer, can easily be recycled and are made in a way that is better for the environment and the health of garment workers. Health, safety and improvement of working conditions in global textile manufacturing are prerequisites. Beyond this, the Guidelines provide minimum requirements for jeans on durability, material health, recyclability and traceability.

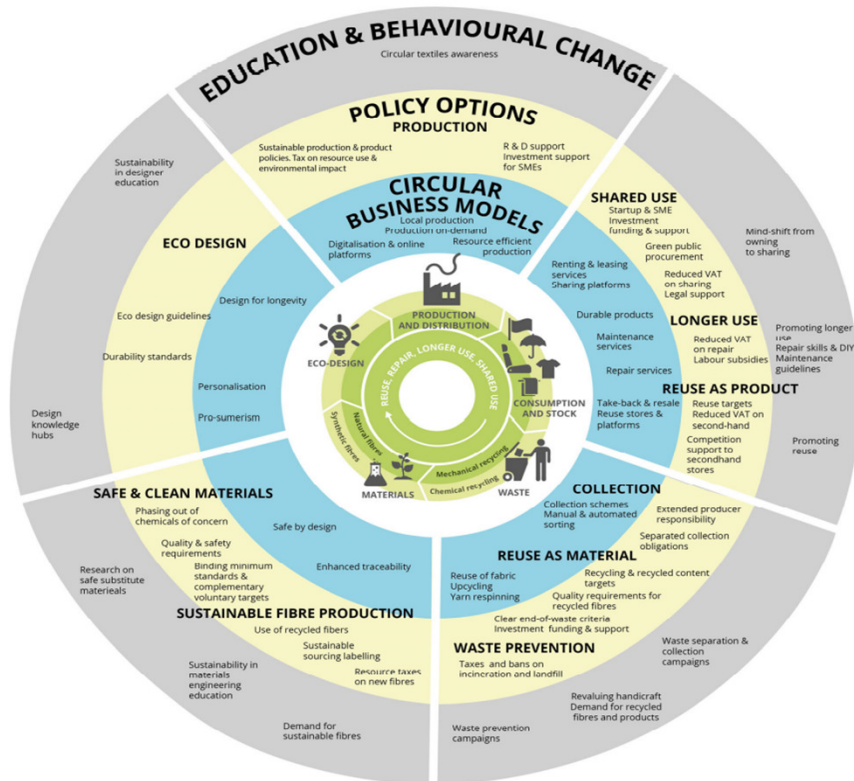
Approaches and Guidelines²⁴

- ▶ Public authorities can steer industry towards sustainable design and production processes.
- ▶ The EU Ecodesign Directive focusses on energy efficiency in energy-consuming products.
- ▶ Production of Guidelines for textiles (Ellen Mac Arthur Foundation, <https://emf.thirdlight.com/link/1jxg1ysqnxil-mz55wp/@/#id=0>)
- ▶ RMIT Textile and Fashion Eco-Design | Quick Guide textilefashion_ecodesign_quickguide.ashx.pdf (datta.vic.edu.au).

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.2 Benefits: Eco-design in opening new challenges in sustainability



Sustainable Textiles^{25,19}

- ▶ Ecodesign is one of the action towards the complete sustainable and circular system for textiles.
- ▶ It is an imitative and it cannot be treated isolated although it can produce some success stories.
- ▶ The transformation of the current textile system to a sustainable and circular one, requires a more systemic change.
- ▶ A circular system requires strong supporting policy measures at all stages of the value chain, new education and behavioural change, new business models, innovative production methods.

Source: EEA and ETC/WMGE, adapted from EEA (2016)

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Unit 2.1 Eco-design highlights

2.1.3 EU Regulations: EU regulations and the constant growth

The textile and fashion industry globally:

The globalisation of the textile and fashion industry has started since the very beginning of trading.

Eventually, the fashion industry turned into fast fashion, meaning by producing larger amounts, with better equipment, ready to wear instead of customised and sewn, while at the same time it is covering international markets.

In order to have a concrete and more thorough image of the regulations set by the EU, regarding the textile industry, visit and read module 6 of this educational platform.

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.3 EU Regulations: EU regulations and the constant growth

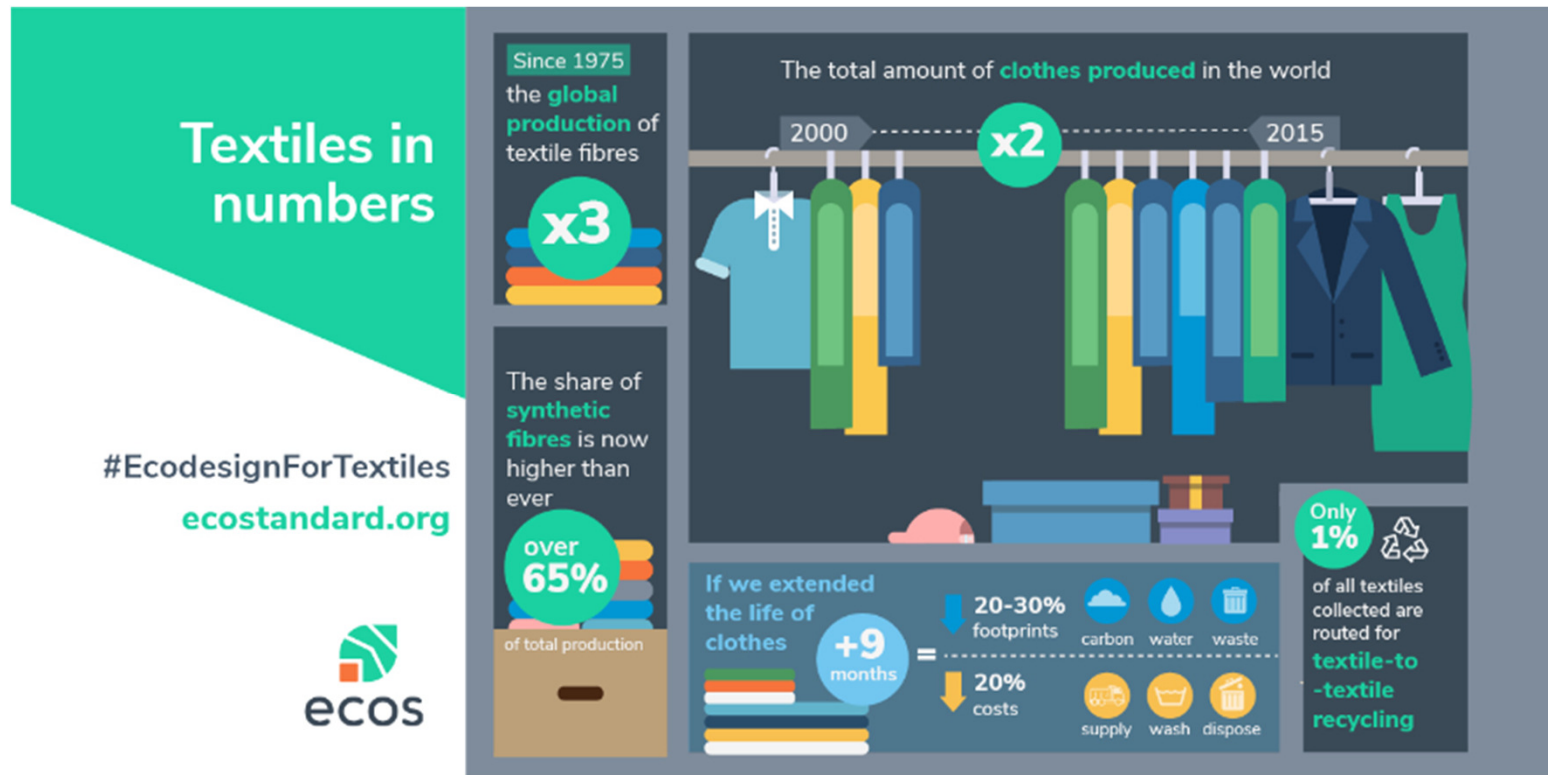


Figure 7: Ecos organization textiles in numbers²¹

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.3 EU Regulations: EU regulations and the constant growth²⁶

- ▶ According to Ecos organization, the European Commission landed the European Green Deal for a more sustainable future and reach it by 2050
- ▶ Businesses must comply with **EU Labelling requirements** (textile labels)
 - ▶ Products with up to 80% of textile fibres
 - ▶ *Clothing*
 - ▶ *Furniture coverings*
 - ▶ *Mattress coverings*
 - ▶ *Camping tents etc.*
- ▶ European legislation on textiles
https://europa.eu/youreurope/business/product-requirements/labels-markings/textile-label/index_en.htm



MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.3 EU Regulations: EU regulations and the constant growth

THE GLOBAL GOALS FOR SUSTAINABLE DEVELOPMENT

THE GLOBAL GOALS



THE GLOBAL GOALS

Figure 8: Global Goals for Sustainable Development²⁷

MODULE 2 Eco- design for circular economy

Unit 2.1 Eco-design highlights

2.1.3 EU Regulations: EU fashion brands and eco-design²⁸

General Product Safety Directive (GPSD) - 2001/95/EC

CE Marking

REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) - EC1907/2006

Personal Protective Equipment (PPE) - Directive 89/686/EEC (re. occupational/safety clothing and footwear)

Biocidal Products Regulation (BPR) - EU 528/2012 (amending regulation 334/2014)

European Labeling Directives (see section on Labeling)

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Unit 2.1 Eco-design highlights

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