Designing Products for the Circular Economy

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UK Legislative Regulation

- 1937 - limiting discharge of specified substances
- 1956 - Clean Air Act
- 1989 - Water Act: "The Polluter Pays" concept
- 1990 - Environment Protection Act: "Statutory nuisance" concept
- 1995 - Environment Act: "Contaminated Land"

EU Legislation

- 1994 Directive on packaging & packaging waste
  - ➢ reduction of landfill (by recycling & reuse)
- 1997 Producer responsibility obligation (packaging waste)

The trend is for increasing regulation of industrial sectors based on producer responsibility

EU Legislation – 2007

- REACH

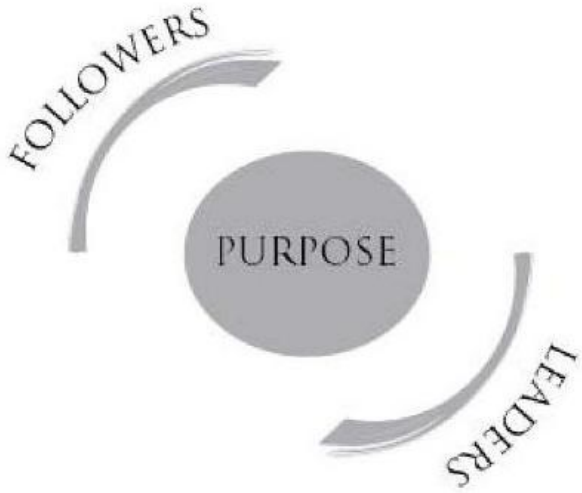
Registration, Evaluation, Authorisation and restriction of Chemicals (Regulation EC 1907/2006)

Replaced 40 existing laws

"REACH places the burden of responsibility on industry to provide evidence that chemical substances are safe for humans and the environment, manage the risk of those chemical substances, and provide appropriate safety information to professional users – and, for the most hazardous substances, also to consumers."

Drivers and Leaders

- Whilst most companies have responded to legislative drivers, some have been more proactive and have led the legislation.
- Building an environmental story into company products requires numerous skills – both managerial and technological
- New tools for analysis are needed



Environment Codes of Practice

- Retailers
- Manufacturers
- ECO Management systems: ISO 14001

The standard makes use of the ‘Plan-Do-Check-Act’ methodology and adopts a strategy of Continual Improvement.

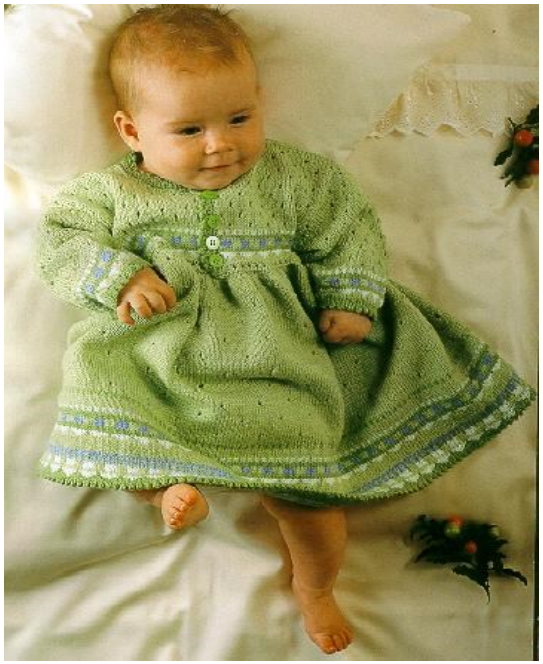
ISO 14006:2011

Environmental management systems – Guidelines for Incorporating Ecodesign, gives guidance on incorporating so-called “ecodesign” into any environmental management system (EMS), quality management system (QMS), or similar management system.

Martin Charter, Convenor of the working group responsible for ISO 14006, said: “The new standard has been developed to help organizations implement ecodesign in a flexible and practical manner. The goal is for organizations to use these principles in order to design and develop more advanced, profitable and sustainable goods and services.”

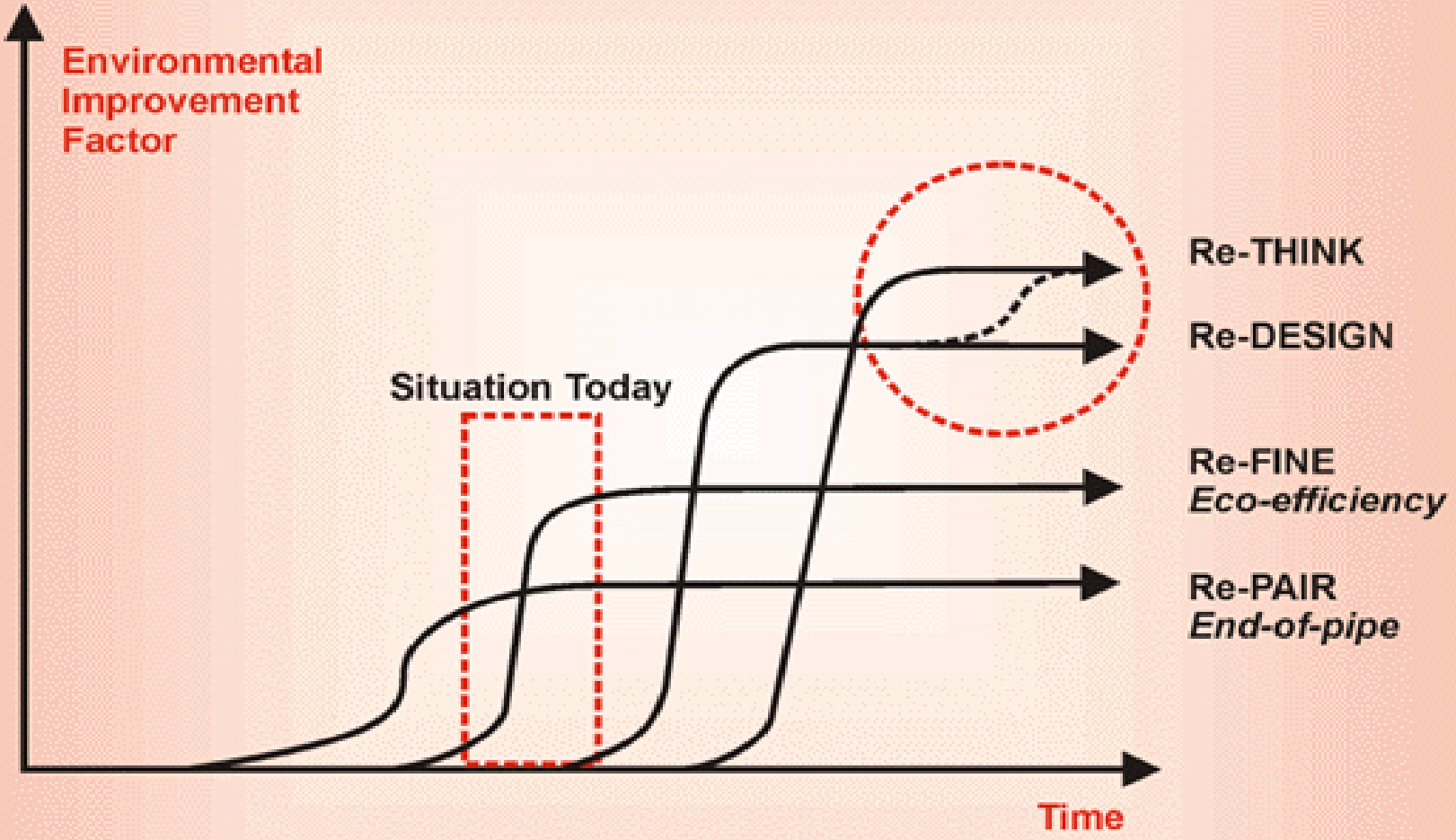
Environmental Issues and Product Design

- Design Decisions have environmental implications:
  - Fibres and textiles
  - textile dyeing & finishing
  - assembly & packaging
  - end-of-life (reuse, recycle, disposal)
- Producer Responsibility issues
  - Design for Environment (DfE)
  - Design for Disassembly (DfD)

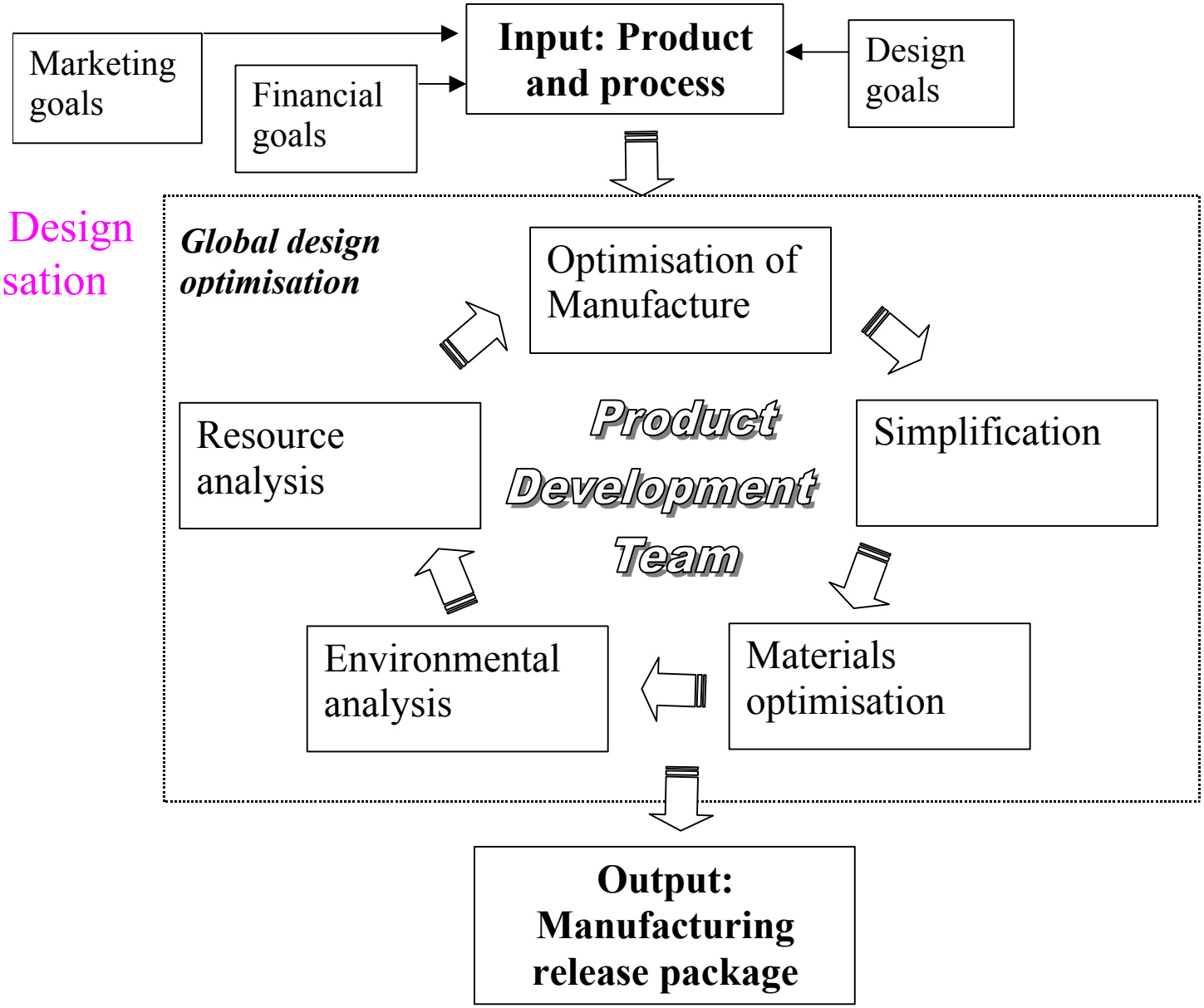


Many green dyes introduce copper to the environment

DfE Concept


Environmental
Improvement
Factor
Situation Today
Re-THINK
Re-DESIGN
Re-FINE
Eco-efficiency
Re-PAIR
End-of-pipe
Time

Concurrent Product Development Model



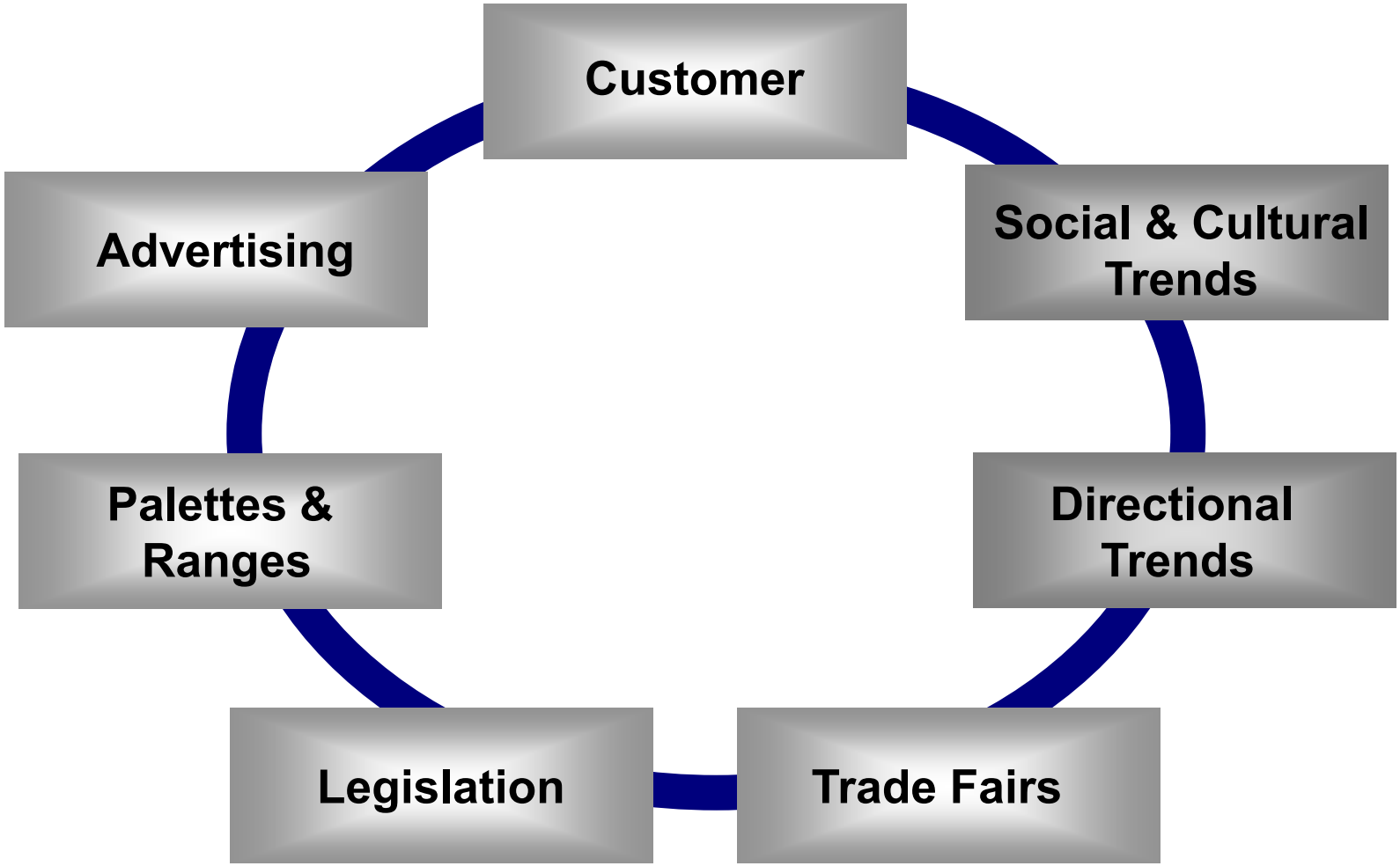
The Effects of Globalisation

Global sourcing trajectories (Gereffi, 1999):

- Outsourcing of assembly
- Outsourcing of sampling
- Outsourcing purchasing of materials
- Introducing vendor certification systems
- Outsourcing pattern grading/marker making
- Outsourcing design

Labour-intensive tasks go first, followed by skill-intensive activities

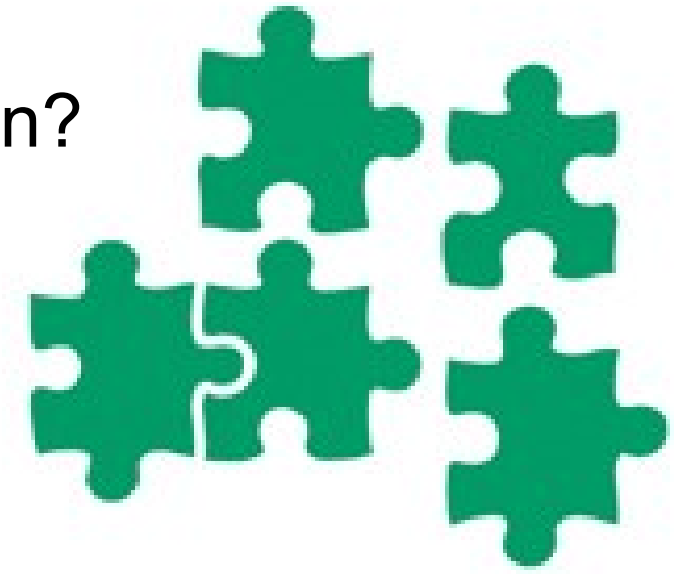
Design & the Fashion Cycle



Design can be isolated from the supply chain and from product life cycle analysis

Fashion & Sustainable Design

- Has globalisation put limits on the application of DfE?
- Should legislation be used to “drive” change?
- What strategic partnerships could make a difference?
- What is the place of education?
- Are consumers observers or participants?



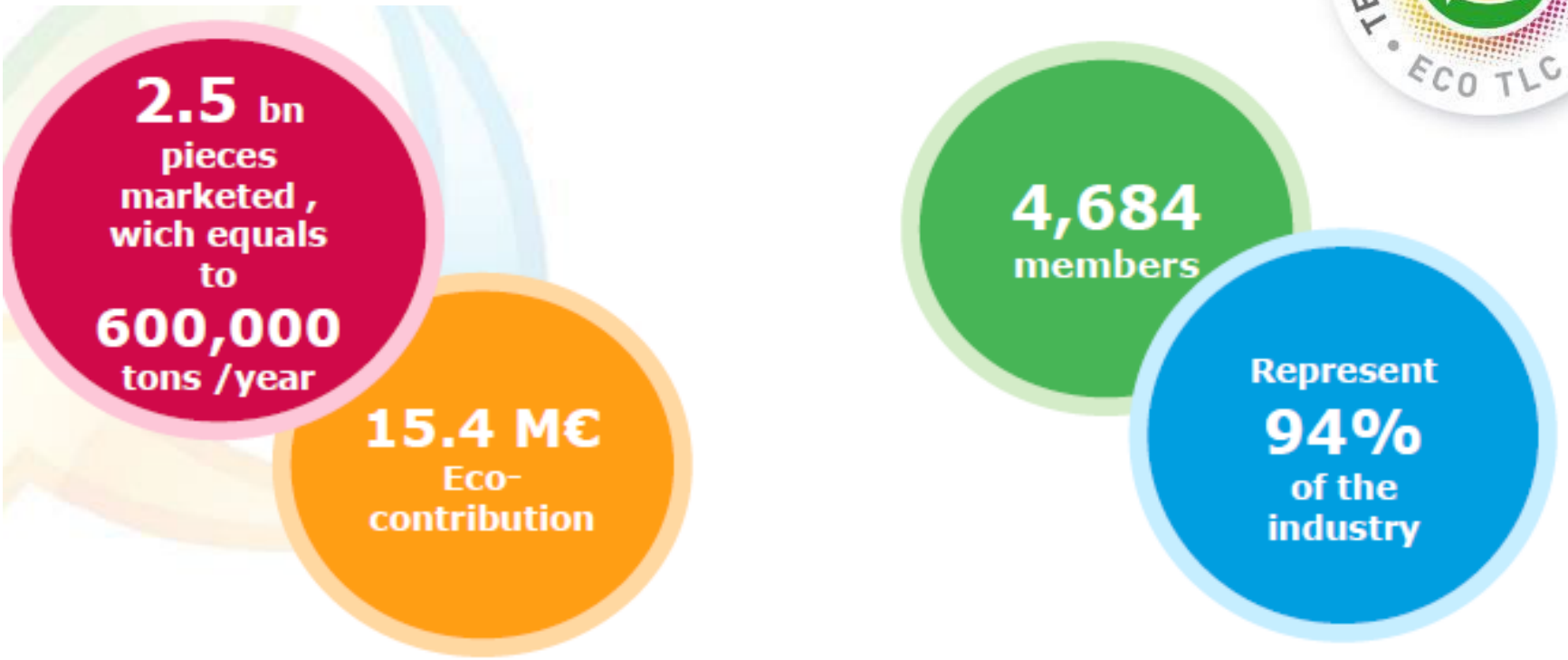
The French Experience

- The French Parliament passed a law (L541-10-3) that extends “producer responsibility” to the end of life for clothing, linen and footwear starting 1st January 2007

- Producers and retailers have two options:
  - CONTRIBUTE finance to an approved collection and recycling system
  - PROVIDE by setting-up and organizing a collection and recycling system that is approved by the State

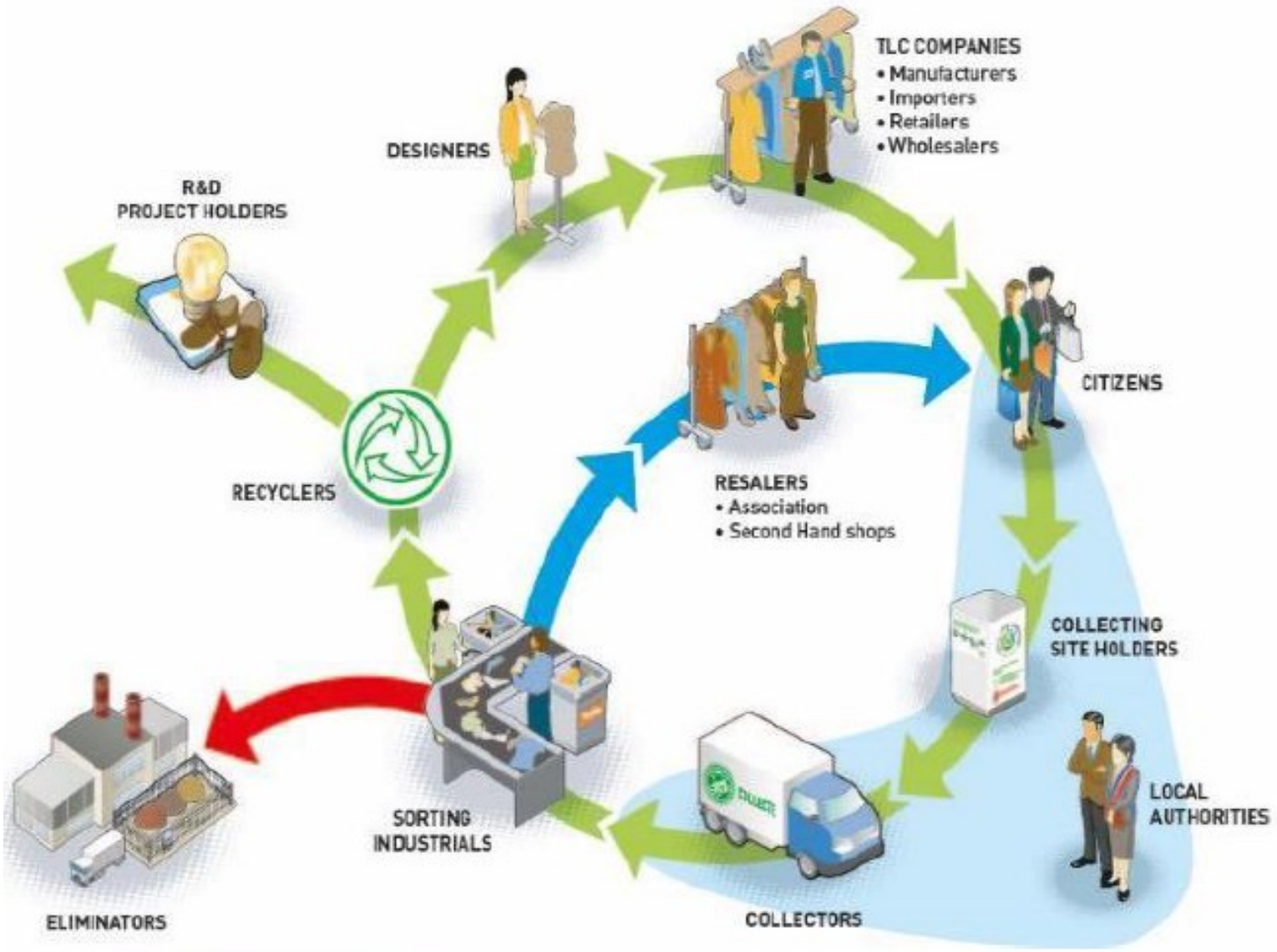
- Eco TLC is the only organization accredited by French public authorities to cover EPR for clothing, linen & footwear

Eco TLC project aims



- to gather all stakeholders of the TLC industry to foster collection, sorting and recovery of used materials
- to work towards the target of 100% reuse and recycling of used TLC

Eco TLC Stakeholders



Some R&D projects

Communauté de communes Pays de Colombey et du Sud Toulois
Create a new plastic using textile as a inert fill

LE RELAIS
Development of tiles for suspended acoustic ceilings

NOVAFLOOR
Incorporating end of life textiles as inert fillers in decorative plates

FRAMIMEX
Combining concrete with textile waste

mapea
Incorporating recycled textiles in plastic materials

BIC ESSUYAGE & HYGIÈNE
Develop an innovative insulation product

BÉTON DE CHIFFONS
New range of acoustic products with a visual appeal, made of recycled textiles

Trucs-Trouvailles
Recycle rubber soles into a new product

DECATHLON
Find new solutions to recycle synthetic textiles

filatures du parc
- Spin yarns with the same quality as with virgin fibres

- Transforming a thin fabric into recycled yarn

Chaussettes orphelines Marcia de Carvalho
Making yarn with used socks

AIR AGENCE INNOVATION RESPONSABLE
Develop a process to recycle shoes by separating and grinding its components

Financing :

- 500 K€ annual budget
- Eco TLC finances up to 50% of the overall cost of the project

Is the French lead one to follow?

- At the conference where the work of Eco TLC was explained, there was considerable enthusiasm from delegates – mainly textile collectors and local authorities.

- Much evidence that legislation linked to finances drives change – including a national approach to collection

- My hesitation is that retailers have handed over the “end of life” problems to a specialist organisation and their product development processes continue as before – the legislation has not led to DfE or DfD.

Summary

- Much environment improvement has been legislation-driven, with "end-of-pipe" clean up.
- Design for Environment is possible whenever new product development is team-based and multi-disciplinary. An environment specialist can contribute much if there is early-stage involvement.
- All stakeholders have a role to play in moving to a circular economy – this seems to be important for the French experiment, where retailers are not implementing DfE and are letting Eco TLC take all the initiatives.