

D4M

g.design : design strategies

key learning objective : understand ecodesign strategies

- design trade-offs
- six 'RE' philosophy
- 'biothinking'
- benchmarking tools
- strategy wheels
- standards

1.

rethink

investigate the internal and external drivers for product or service (re)design.

these drivers could include legislation, customers, new technology, competition.

2.

assess

assess the environmental impacts of the product.

map the product life cycle so you understand where these impacts occur. identify where materials and energy is used and where waste is produced.

3.

design

select ecodesign strategies that will allow designers to tackle the main environmental impacts.

explore the compromises and trade-offs. involve others from marketing, sales, production, purchasing.

4.

communicate

develop a clear brand and marketing strategy to reflect and communicate the environmental improvements.

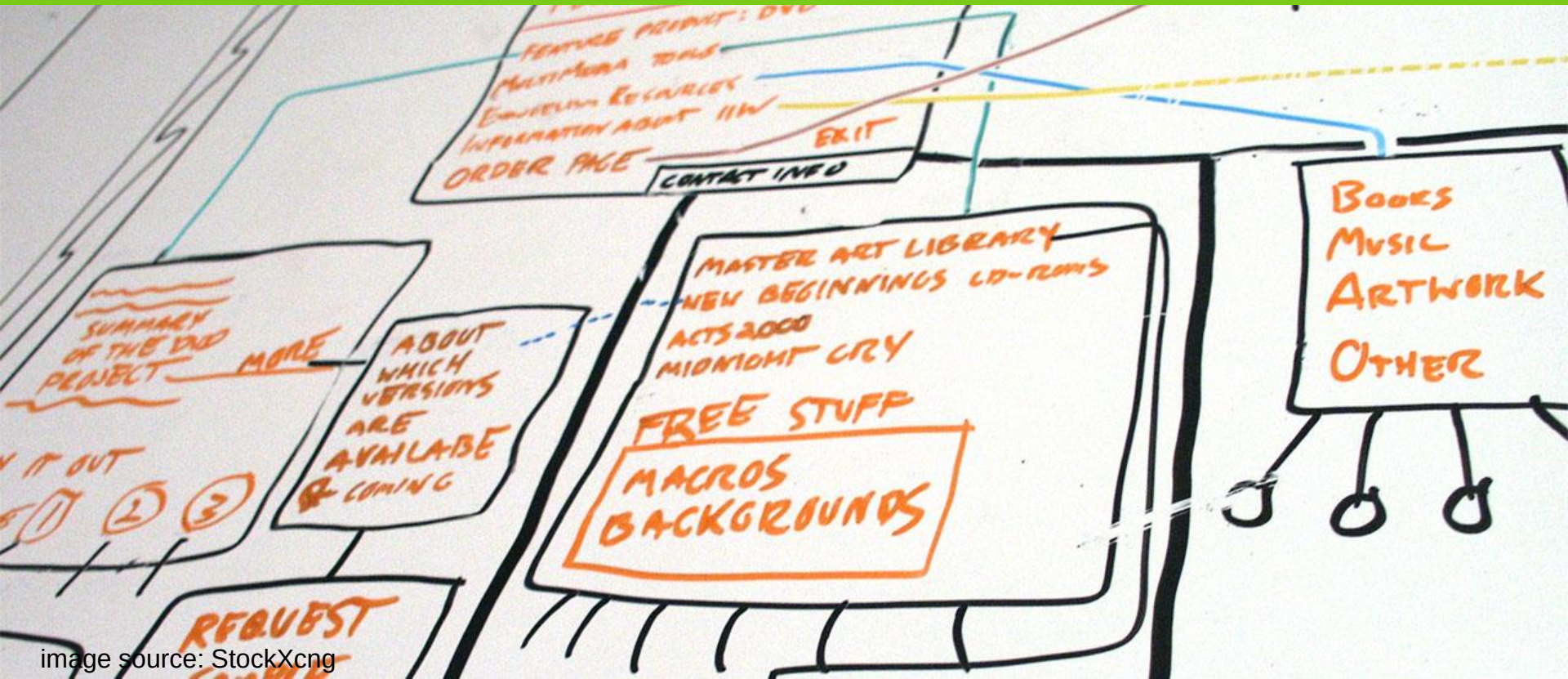
consider the product packaging and how this will impact upon the brand.

3. Design

	Analysis/Planning	Concept design	Detailed design	Prototype/ Testing	Market Launch	Product Review
Strategy tools						
Driver analysis						
Stakeholder assessments						
Research tools						
Usability testing						
Market analysis						
Creativity techniques						
Ecodesign checklists						
LiDS Wheel						
Rules of thumb						
Material matrices						
Material selection software						
Recycling checklist						
Guidelines						
Met Matrix						
Extended design matrix						
Eco-indicator						
Ecological footprint						
Life cycle costing						
Life cycle analysis						
Benchmarking						
Strategy wheel						
Standards						

strategy

- ecodesign strategies set out frameworks of decisions that will influence an approach to design
- some strategies can be complex and rigorous whereas some strategies are simple



strategy: design trade offs

- design is often concerned with balancing trade offs arising from decisions
- While these trade offs depend on the product being designed there are some typical ones in ecodesign

making these choices

can sometimes mean....

using recycled materials

lower tolerances & specifications

increasing energy efficiency

higher electronic design costs

extending product life

new product sales reduction

design for disassembly

higher production costs

biodegradability

shorter life, lower strength

local production

fewer choices / less selection

leasing instead of owning

increased transport impacts

dematerialization

fragility / shorter life

strategy tools: rules of thumb

- rules of thumb are broad principles for making decisions or calculations
- they are very open but are simple entry points
- examples include 3Rs (reduce, reuse, recycle)

re-think the product and its functions

re-duce energy and material consumption

re-place harmful substances

re-cycle - select materials that can be recycled, and design for disassembly and recycling

re-use - design the product so parts can be reused

re-pair - make the product easy to repair for longer life

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strategy tools: Biothinking

- five design requirements for sustainable products
- using the basic protocols followed by natural systems

cyclic

products made from organic materials that are recyclable, compostable or closed loop.

solar

products uses solar energy or other forms of renewable energy that are cyclic and safe, both during use & manufacture

safe

products are non-toxic in use and disposal.

manufacture does not involve toxic emissions or the disruption of ecosystems.

efficient

efficiency in manufacture and use is improved.

social

products, components & raw materials manufactured under fair and just conditions



Products are made from compostable organic materials or from minerals that are continuously cycled



Products in their manufacture and use consume only renewable energy that is cyclic and safe



All releases to air, water, land or space are non-toxic

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strategy tools: benchmarking

- benchmarking is a structured approach to examining and comparing, from an environmental perspective, the processes supporting different design activities.
- environmental benchmarking is an environmental management tool



Energy
consumption



Packaging



Hazardous
substances



Weight



Recycling
and disposal



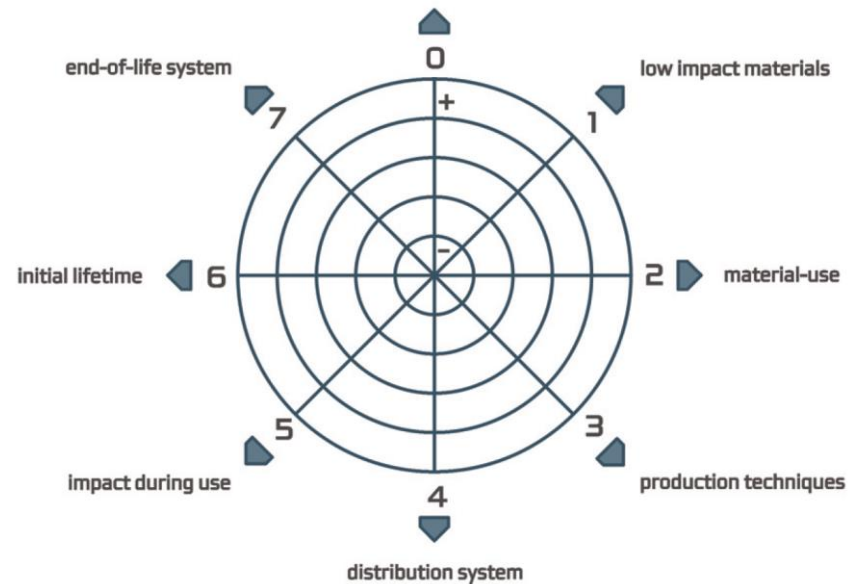
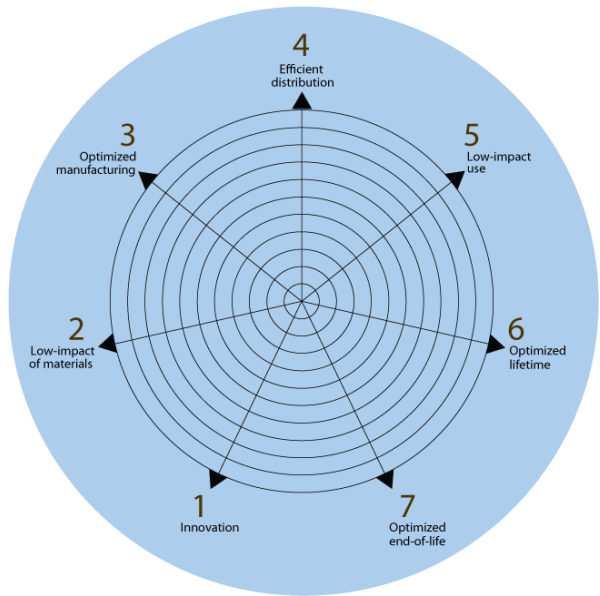
Lifetime
reliability

PHILIPS

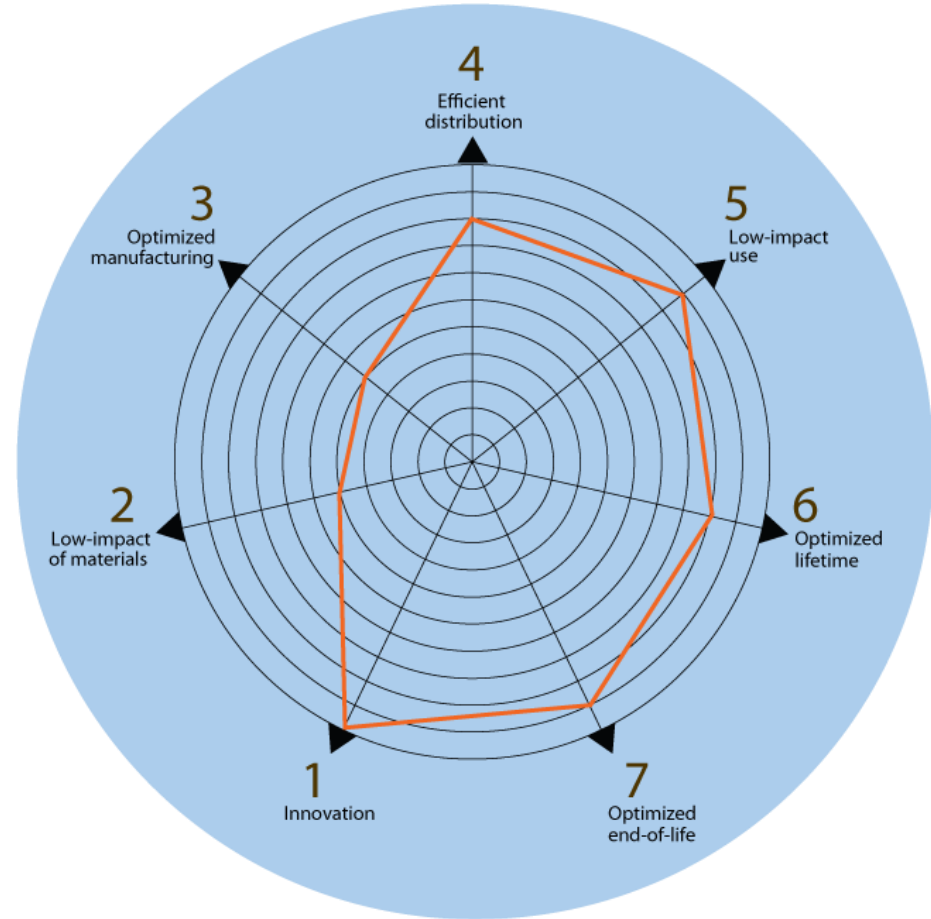
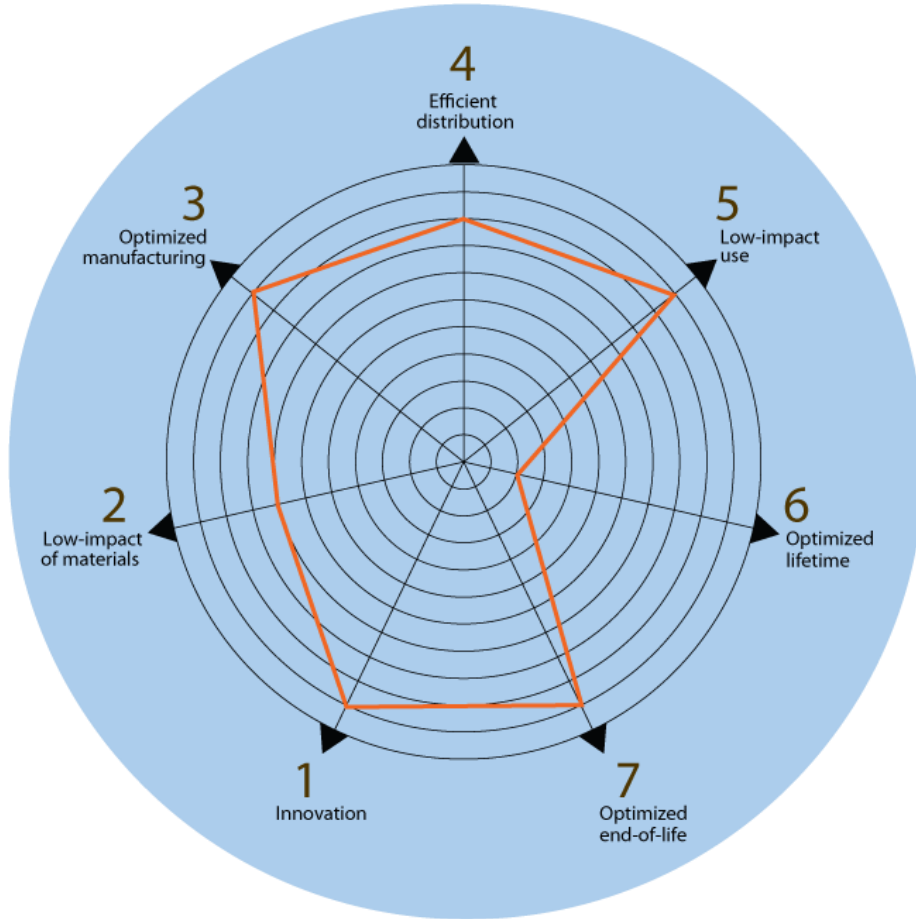
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strategy tools: strategy wheels

- provide a basic framework that you can use systematically to review the entire life cycle of a product. It is a tool that can:
 - stimulate the creative design process.
 - assist in visualizing current environmental performance.
 - highlight opportunities for improvement.



Analysis/planning	Concept design	Detailed design	Prototype/testing	Market launch	Product review



strategy tools: standards

- a technical standard is a formal document that set uniform engineering or technical criteria, methods, processes and practices.
- examples of ecodesign related standards include : **ISO 14000, ISO TR 14062, IEC 62430, BS 8887**

Standard ECMA-341

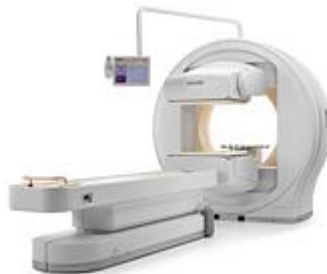
2nd Edition / December 2004

**Environmental design
considerations for ICT
& CE products**

Analysis/planning	Concept design	Detailed design	Prototype/testing	Market launch	Product review
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Philips EcoVision & Green Flagship Products

- More than 200 Green Flagships products on the market
- 24% more Green Flagships in 2006
- Total sales of Green Flagships of EUR 2.2 billion



Philips EcoVision & Green Flagship Products

To achieve Green Flagship status

- product must be investigated in at least three Green Focal Areas
- Life Cycle Score needs to be calculated and improvement criteria met



Energy
consumption



Packaging



Hazardous
substances



Weight



Recycling
and disposal



Lifetime
reliability

DECT 525

- consumes 54% less energy
- uses 14% less packaging
- 33% lighter
- improves recycling and disposal by 12%.
- eliminated cadmium, lead and mercury



Division	Product group	Product type number	Energy consumption	Packaging	Hazardous substances	Weight	Recycling and disposal	Lifetime reliability	Notes
Medical Systems	Ultrasound Transducer	V8-4	●			●		N.A.*	
	MRI Scanner	Achieva 1.5T Release 2MRI Scanner	●			●		N.A.	
	SPECT Camera	BrightView Nuclear Medicine SPECT Camera	●		●	●		N.A.	
Consumer Electronics	42" LCD TV	42PF9730	●	●				N.A.	
	42" LCD TV	42PF7621D/10	●					N.A.	
	32" LCD TV	32PF9531/10	●					N.A.	
	32" LCD TV	32PF9531/98	●					N.A.	
	42" LCD TV	42PF9731D/37	●					N.A.	
	29" real flat TV	29PT8865	●	●				N.A.	
	32" LCD TV	32PF5321/12	●	●				N.A.	
	32" LCD TV	32PF7321/93	●	●				N.A.	
	1GB audio player	SA9100	●			●		N.A.	
	VGA CMOS Webcam	SPC610NC	●	●		●		N.A.	
	Mobile phone	CT1898	●					N.A.	
	Mobile phone	CT7568	●	●		●		N.A.	
Lighting	Lighting Electronics	Actilume	●		●			●	
	Lamp	TL-D 90 DE LUXE	●		●				
	Lamp	TL-D 90 Graphica			●				
	Lamp	TL-D FOOD			●				

other spider-web and polar diagrams

Name	Description	Source/contact
Environmental Footprint	Environmental fields emphasis resource depletion and waste disposal	PA Consulting
LIDS Wheel	Gives designer an overview of environmental improvement potential Can be used with MET Matrix and Ecodesign checklist, and in workshops and brainstorming sessions	Brezet/Van Hemel 1997
Spider-diagram, e(c)oncept	Uses a flexible set of criteria according to focus May be used in a workshop	E(c)oncept, Germany
Eco-Compass	Developed as part of Dow's Eco-Innovation process. Holistic description of a product's environmental impacts according to chosen criteria.	Developed by Dow Europe see Fussler &James 1998