Essential requirements, packaging optimisation with harmonised standards

1st international workshop

Padua, Italy

CCIS – Antonia Bozic Cerar

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What are the essential requirements?

- minimisation and prevention — obligatory
- reusable packaging — optional
- recoverable packaging — one choice is obligatory!
  - material reycling
  - energy recovery
  - composting
  - biodegradable decomposition to carbon dioxide, biomass and water

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EN 13428:2004 source minimisation

- Prevention by source reduction
  - product protection
  - packaging manufacturing process
  - packing/filling process
  - logistics
  - product presentation and marketing
  - user/consumer acceptance
  - information
  - safety
  - legislation
  - other..

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Know your product!

- preservation
- protection
- containment
- taste
- hygiene
- microbiological contamination
- exposure to light, UV rays (fruit juices..)
- required/desired shelf life
- ...

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Know your packaging (material)!

- shape
- thickness
- tolerances
- size
- feasibility
- tooling specifications
- waste management
  - hazardous substances
  - Hg, Cr^{6+}, Cd, Pb limits

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Know your process (Packing/Filling)

- impact and stresss resistance
- mechanical strength
- packing line speed and efficiency
- stability,
- heat resistance
- effective closing
- headspace
- hygiene

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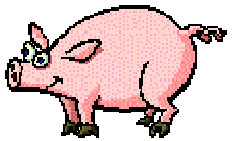
Logistics

transport, storage and handling

- combinations of primary, secondary and tertiary packaging
- space utilisation
- packaging integrity
- damage resistance

How much does it weigh?

- The packaging system
  - primary &
  - secondary &
  - tertiary



- Packaging efficiency

$$\text{Packaging ratio} = \frac{\text{packaging weight}}{\text{product weight}} \text{ in\%}$$

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How much does it cost?

- incoming materials- price per box
- incoming logistics – cost per truck
- raw material storage – cost per pallet
- manufacturing cost per unit to assemble, fill and seal packaging outgoing logistics (storage and transportation)– cost per pallet
- waste disposal
  - extended producer responsibility fee
  - waste packaging produced on site (shipped raw materials, auxilliary materials...)
  - **disposal** costs of trimmings, faulty packaging and abandoned product;
  - environmental taxes and charges

Product presentation and marketing

- product identification
- brand
- labelling
- retail display
- compatibility with refill systems
- pilfer resistance

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User/consumer acceptance

- tamper evidence
- portion size and product dispensing
- no sight of damage or deterioration
- storage /shelf life
- handling
- attractiveness
- ...

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Information

- food regulation (nutrition, addititives, preservatives...)
- storage instructions
- preparation, i.e. cooking
- best before date
- bar codes
- packaging material identification
- environmetal information (mobius loop, tidyman, green dot)
- ...

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Safety

- tampering evidence
- worker safety (logistics)
- child resistance
- safe opening

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Legislation

- food contact regulations,
- good manufacturing practice (quality assurance)

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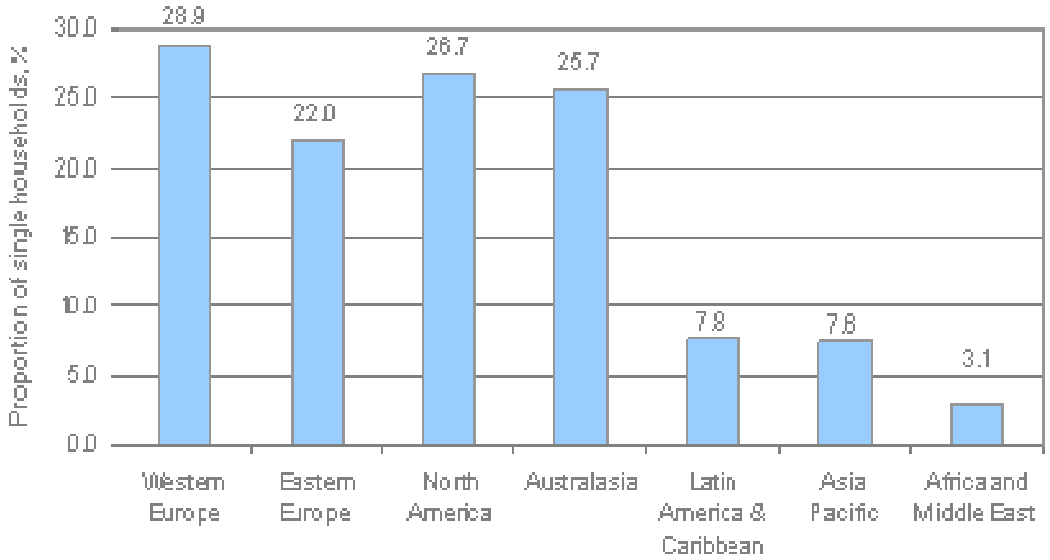
Other

- economic,
- social,
- environmental



Euromonitor

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The initial survey

- getting started:

- determining company priorities:

An elegant solution to your survey - Sweet Surveys

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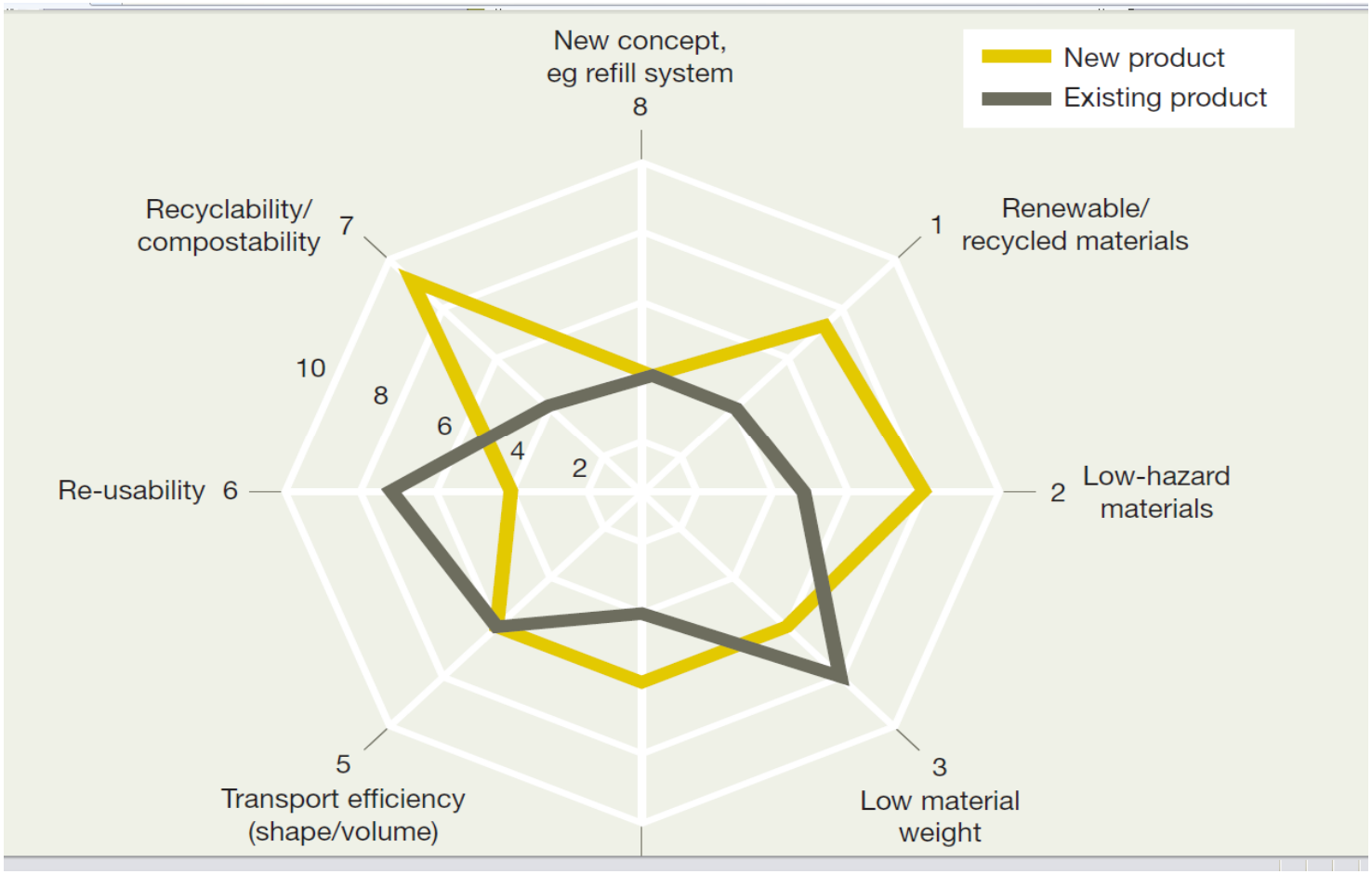
decisions, decisions?



spider diagramme or ecowheel

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MET matrix

	Materials	Energy	Toxicity	Total score	Score (%)	Relative score
Weighting factor	3 x	3 x	5 x			
Option 1	3 (9)	3 (9)	5 (25)	43/55	78%	100%
Option 2	4 (12)	5 (15)	2 (10)	37/55	67%	86%
Option 3	2 (6)	4 (12)	4 (20)	38/55	69%	88%

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EN 13429: 2004 -Reuse

- It is an option, not a requirement
- Reuse for the same purpose for which the packaging was originally conceived
  - must secure a no. of trips or rotations (a reuse system must exist)
  - must ensure H&S of the workforce (during reconditioning – cleaning, refilling,repair, redistribution)
  - what happens when it becomes waste!
    - typical example: wood/plastic pallets

EN 13430: 2004 –material recycling

- material recycling of a certain percentage of packaging waste
  - material
  - declaration on % of weight of functional unit of packaging available for reycling
  - demonstration of compatibility with recycling technologies
    - substances causing potential technical problems in the recycling process
    - combinations of materials or designs causing problems of collection and sorting
    - substances causing potential contamination of the recycled material – influence on quality

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EN 13431: 2004 –Energy recovery

- Energy recovery
  - the waste must have a minimal calorific value
  - it must generate energy when combusted
    - aluminium up to 50μm
    - $q_{net} \geq 5$ MJ/kg
    - organic content $\geq$ 50% by weight
    - limited contents of heavy metals or dangerous substances

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EN 13432: 2001 – Composting and biodegradation

- shall not hinder the composting process
- is capable of physical, chemical, thermal or biological decompostion ⇒ carbon dioxide, biomass and water
  - materials of natural origim shall be accepted as biodegradable without testing (wood, paper, cotton...)
  - aerobic composting
  - biodegradability test...

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Compostable packaging

A round of applause to the food companies helping to reduce packaging waste. Leading the way are the Village Bakery (01768 898437; village-bakery.com) and supermarket chain Morrisons. The bakery has repackaged five of its organic, additive-free breads, including Rye and Coriander (400g for £1.55) and Spelt (400g for £1.69), in biodegradable bags. Morrisons, meanwhile, is using compostable packaging for its organic fresh produce. Both types of wrapping can be thrown on your own compost heap – good news for the environment. Let's hope other food retailers follow the lead...

EN 13427:2004:umbrella

- combines reference standards:
  - EN 13427 Packaging – requirements specific to manufacturing and compostion – Prevention by source reduction
  - EN 13429 Packaging – Reuse
  - EN 13430 Packaging – Requirements for packaging recoverable by material recycling
  - EN 13431 Packaging – Requirements for packaging recoverable in the form of eneergy recovery, including specification of minimum inferior calorific value
  - EN 13432 Packaging – Requirements or packaging recoverable through composting and biodegradation – Test scheme and evaluation critera for the final acceptance of packaging

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Statement of conformity

Example format for statement of compliance with standard EN 13427:2004

Packaging identification	Assessment reference

Identification of principal materials used

Summary of assessment

Standard/Report	Assessment requirement	Claim	Note
1.1. Prevention by source reduction	ensure only minimum adequate amount of material in the packaging system (EN 13428)		
1.2. Heavy metals	ensure below maimum permitted levels for componenets (CR 13695-1)		
1.3. Dangerous substances	ensure in compliance with EN 13428		
2. Reuse	ensure reusability in all terms of the standard for the functional unit of packaging (EN 13429)		
3.1. Recovery by material recycling	ensure recyclability in all terms of the standard for the functional unit of packaging (EN 13430)		
3.2. Energy recovery	ensure recoverability in all terms of the standard for the functional unit of packaging (EN 13431)		
3.3. Organic recovery	ensure compostability in all terms of the standard for the functional unit of packaging (EN 13432)		

NOTE: Conformity with EN 13427 requires affirmative responses to sections 1.1, 1.2, 1.3, and to at least one of 3.1, 3.2, 3.3. In addition, where a claim of reuse is made section 2 should also record affirmative responses.

Statement of conformity

In light of the assessment results recorded in part I above, this packaging is claimed to comply with the requirements of EN 13427

Signed on behalf of (Name and address of supplier)

Signature:

Position Date

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How the standards are related!?

Manufacturing and composition	**Reuse**	**Recovery**
Prevention by source reduction(EN 13428)	Reuse (EN 13429)	Material recycling (EN 13430)
Requirements for measuring and verifying the four heavy metals present in packaging (CR-13695-1)		Energy recovery (EN 13431)
Requirements for measuring and verifying dangerous substances present in packaging (CR-13695-2)		Organic recovery (EN 13432)

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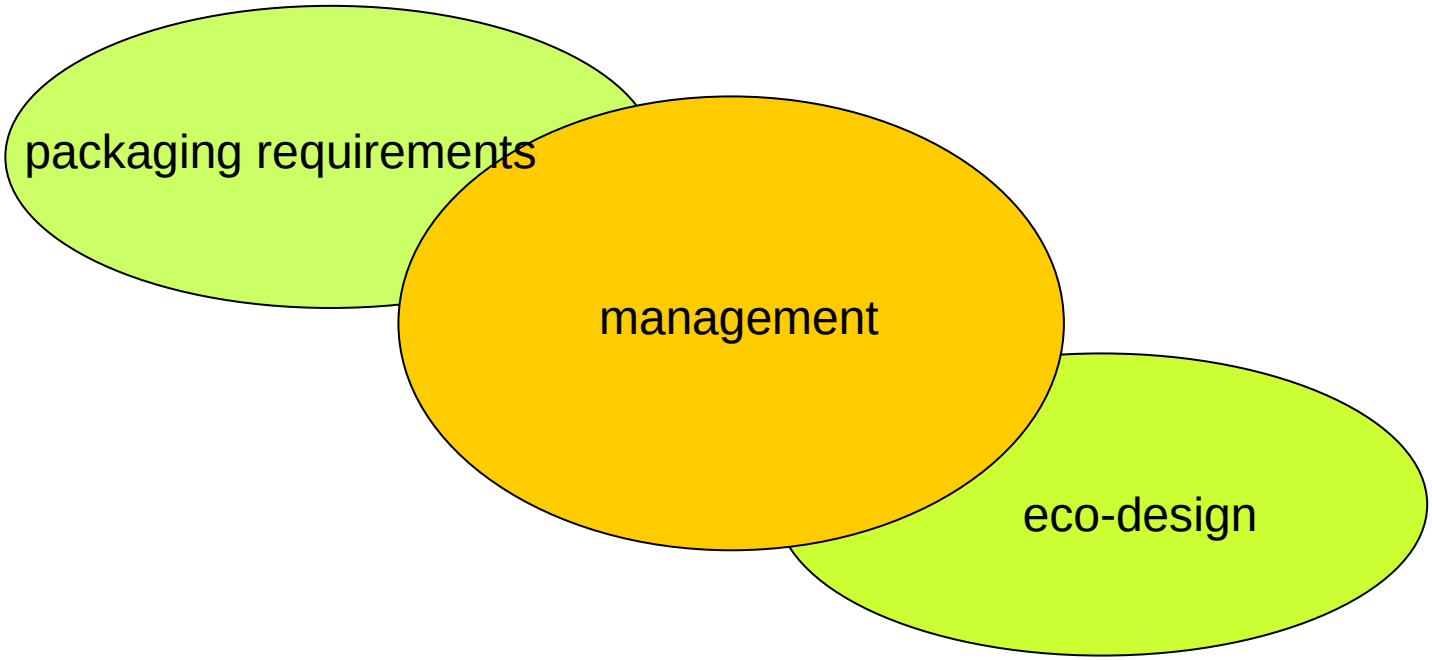
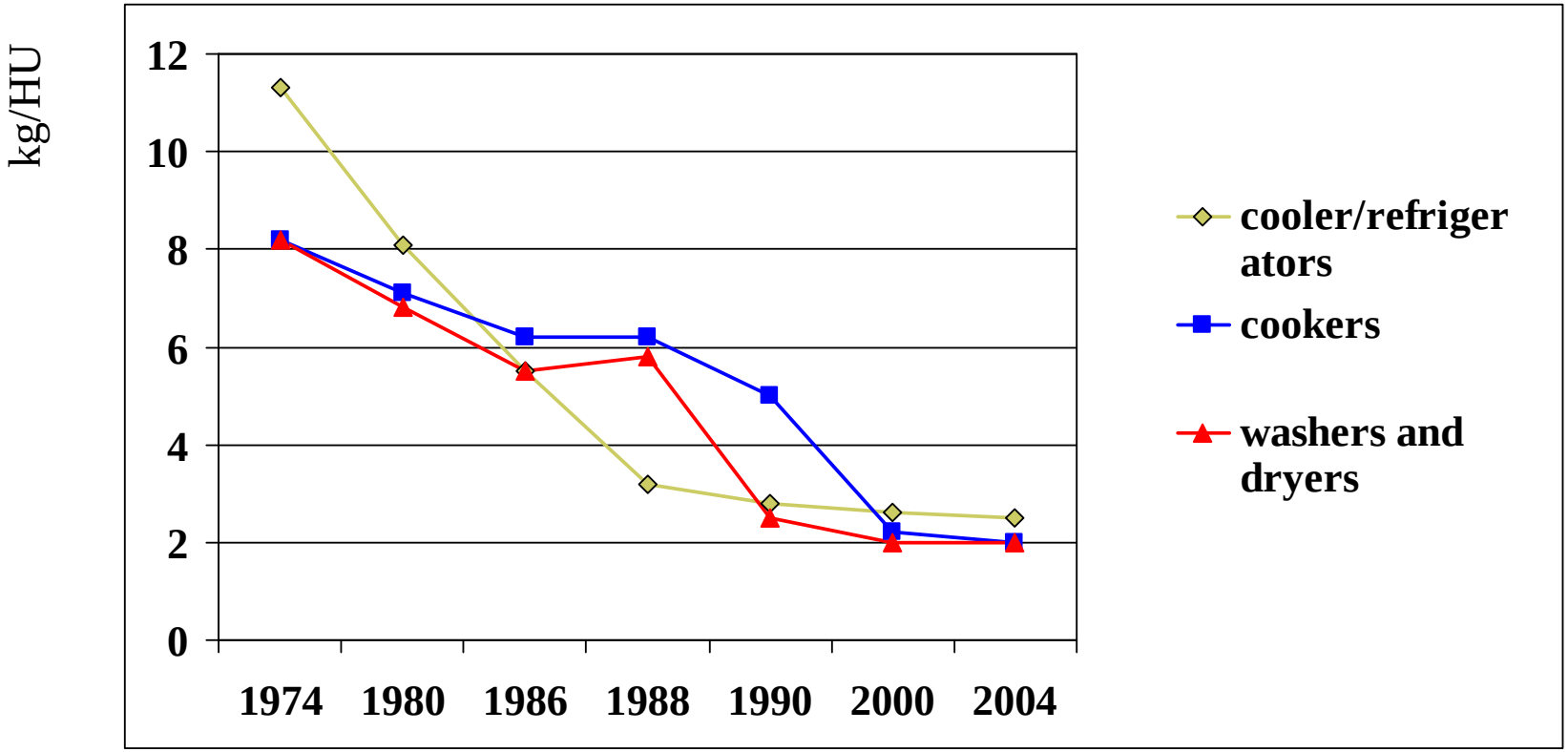
Essential requirements & ecodesign



↓ weight/h. unit (example Gorenje)

from ~ **9 kg/HU** (1974) to ~ **2 kg/HU** (2000-2004)



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Ecodesign meets packaging

- cheaper packaging
- less weight
- simpler materials,
- more recycled materials,
- more recyclable materials
- packaging from a nearer location
- less embedded carbon
- public image

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useful information

- Packaging essential requirements regulations, Government guidance notes (UK)
- Code of practice, responisble packaging, incpen
- A packaging guide for small business, Repak
- Packaging design for the environment, envirowise
- Essential requirements for packaging in Europ, Europen – A pratical guide to using the CEN standards

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