

Overview of EU and national legislation – waste (paper)

Seminar and round table

Ljubljana,
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Waste – the definition (1975)

‘waste’ means any substance or object which the holder disposes of or is required to dispose of pursuant to the provisions of national law in force;

‘disposal’ means:

- the collection, sorting, transport and treatment of waste as well as its storage and tipping above or under ground,**
- the transformation operations necessary for its re-use, recovery or recycling.**

Waste – the definition (1991)

“waste” shall mean any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard.

The Commission, acting in accordance with the procedure laid down in Article 18, will draw up, not later than 1 April 1993, a list of wastes belonging to the categories listed in Annex I. This list will be periodically reviewed and, if necessary, revised by the same procedure ;

List of waste

- article 7 of Directive 2008/98/EC and Decision 2000/532/EC
 - origin
 - mirror entries with* for hazardous waste
- inclusion of a substance or object shall not mean that it is waste in all circumstances

LOW - example

02 07 99	sludges from on-site chemical treatment	AN	
02 07 99	wastes not otherwise specified	AN	
03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD		
03 01	wastes from wood processing and the production of panels and furniture		
03 01 01	waste bark and cork	AN	
03 01 04*	sawdust, shavings, cuttings, wood, particle board and veneer containing dangerous substances	MH	
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04	MN	
03 01 99	wastes not otherwise specified	AN	
03 02	wastes from wood preservation		
03 02 01*	non-halogenated organic wood preservatives	AH	
03 02 02*	organochlorinated wood preservatives	AH	
03 02 03*	organometallic wood preservatives	AH	
03 02 04*	inorganic wood preservatives	AH	
03 02 05*	other wood preservatives containing dangerous substances	MH	
03 02 99	wood preservatives not otherwise specified	MN	
03 03	wastes from pulp, paper and cardboard production and processing		
03 03 01	waste bark and wood	AN	
03 03 02	green liquor sludge (from recovery of cooking liquor)	AN	
03 03 05	de-inking sludges from paper recycling	AN	
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard	AN	
03 03 08	wastes from sorting of paper and cardboard destined for recycling	AN	
03 03 09	lime mud waste	AN	
03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical	AN	

Waste – the definition (2008)

‘waste’ means any substance or object
which the holder discards or intends or is
required to discard

waste hierarchy

- prevention

waste does not yet
exist

- preparing for re-use

- recycling,

- other recovery e.g. energy recovery and

recovery

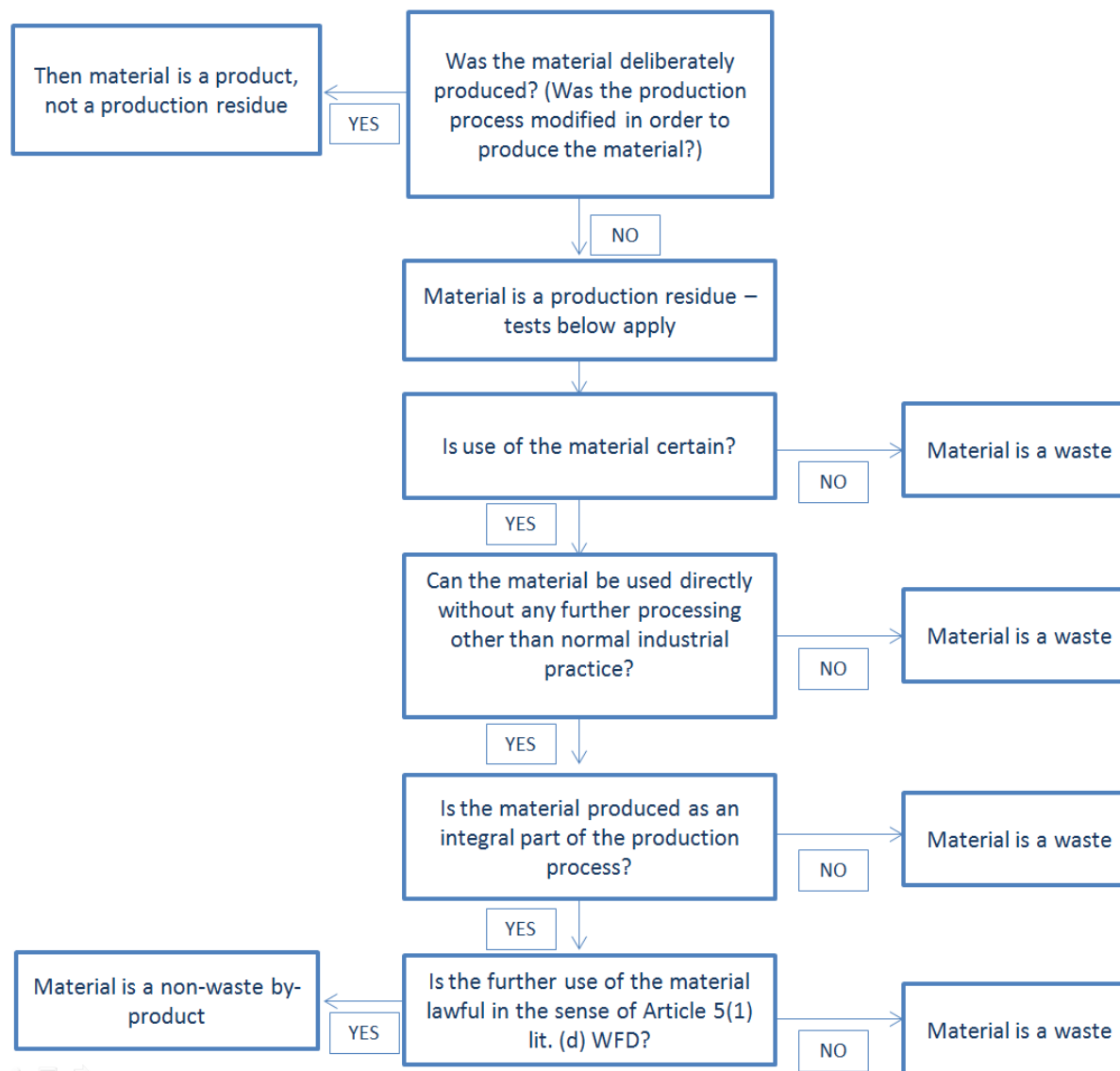
- disposal

incineration
and
disposal

By-products

- further use of the substance or object is certain
- the substance or object can be used directly without further processing other than normal industrial practice
- the substance or object is produced as an integral part of the production process and
- further use is lawful, i.e. the substance or object fulfils all relevant product environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts

Decision tree for by-product



<http://youtu.be/YnOq-rdj5Q8>

End-of-waste status

- the substance or object is commonly used for specific purposes
- a market demand exists for such a substance or object
- the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products and
- the substance or object will not lead to overall adverse environmental or human health impacts

End of waste regulation

- ~~• Proposal for a **COUNCIL REGULATION** on defining criteria determining when recovered paper ceases to be waste pursuant to Article 6 (1) of Directive 2008/98/EC on waste (COM(2013) 502 final;2013/0235 (NLE))~~
- Council regulation EU 333/2011 for scrap metal (steel and aluminium)
- Council regulation EU 1179/2012 for glass cullet
- Council regulation EU 715/2013 for copper scrap

Quality system



STATEMENT BY THE VERIFIER

on the conformity to the requirements of the Council Regulation (EU) No. 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council.

Katalin Moravcsikné File and Klára Tóthné Kiss, verifiers of the accredited organization ÉMI-TÜV SÜD Kft.

EMAS environmental verifier registration No.: HU-V-0001/2009

accredited with the jurisdiction below: 38 (NACE-code)

hereby declare that they have validated the quality assurance system at the central site and at the listed sites of the organization:

Central site:

GORENJE SUROVINA d.o.o. SI - 2000 Maribor, Ulica Vita Kraigherja 5

Sites:

GORENJE SUROVINA d.o.o.

GORENJE SUROVINA d.o.o.

GORENJE SUROVINA d.o.o.

GORENJE SUROVINA d.o.o.

SI - 2000 Maribor, Lahova 36-40

SI - 2360 Radlje ob Dravi, Mariborska cesta 44

SI - 1000 Ljubljana, Cesta dveh cesarjev 370

SI - 3310 Žalec, Ulica Savinjske čete 18

Product groups:

EOW FERROUS PRODUCTS

steelmaking raw material

foundry raw material

steel tubes, profiles, tracks

steel plates

EOW ALUMINIUM PRODUCTS

alloyed aluminium

unalloyed aluminium

electrical cables and wires

They have audited whether the organization satisfies all the requirements of the Council Regulation (EU) No. 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council.

By signing this statement we hereby certify that:

- the implementation of the verification fully meets the requirements of the Council Regulation (EU) No. 333/2011,
- the outcome of the verification confirms that regarding the sites and group products listed above the organization has introduced and operates the quality assurance system in compliance with article 6 of Council Regulation (EU) No. 333/2011, it fulfills the criteria specified in Annexes I and II of the regulation and meets the criteria of the audit.

Registration number: **HU-EOW-0001/2011**

Date: 01/12/2011

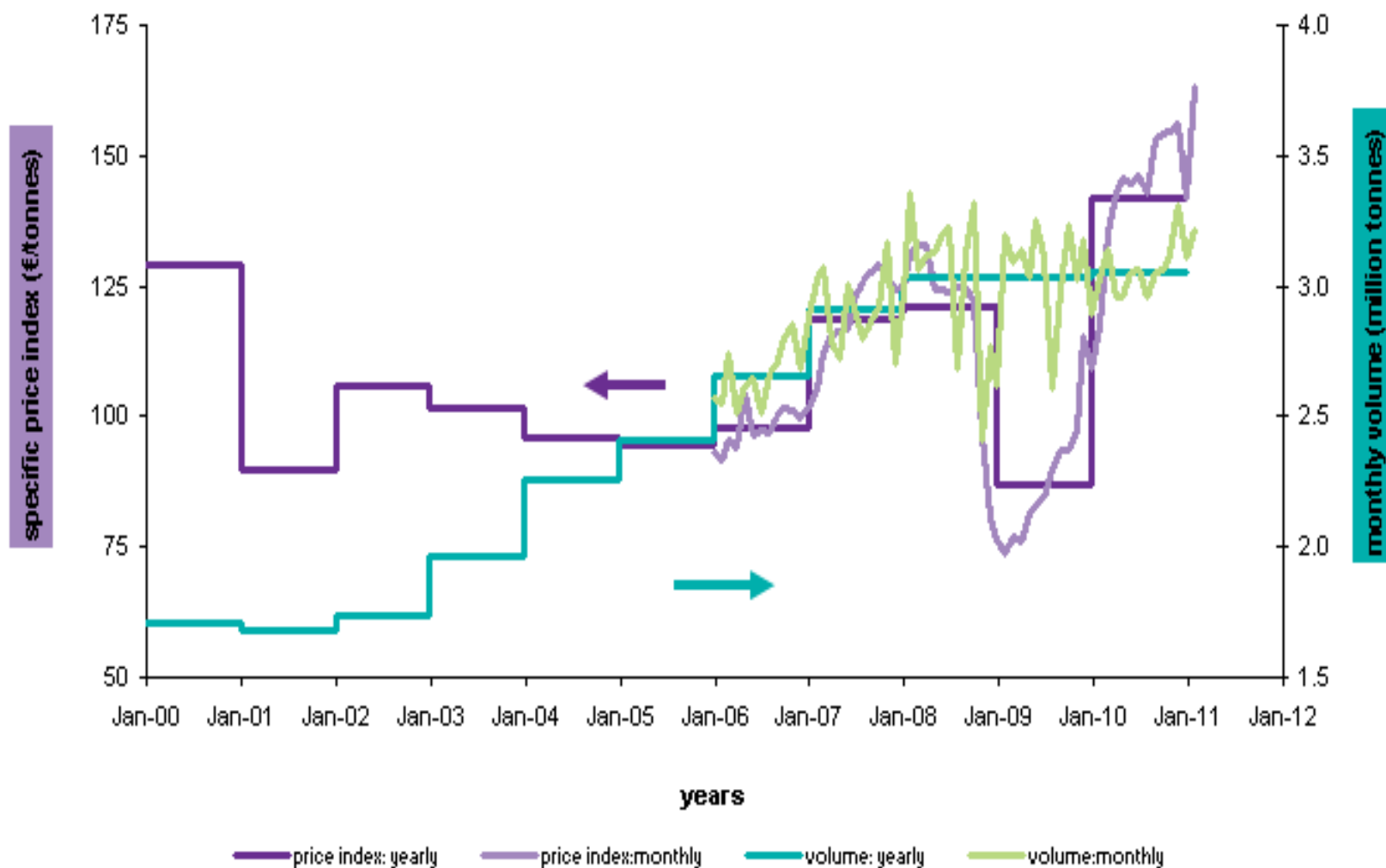
Katalin Moravcsikné File
Katalin Moravcsikné File
EMAS verifier



Klára Tóthné Kiss
Klára Tóthné Kiss
EMAS verifier

Novice

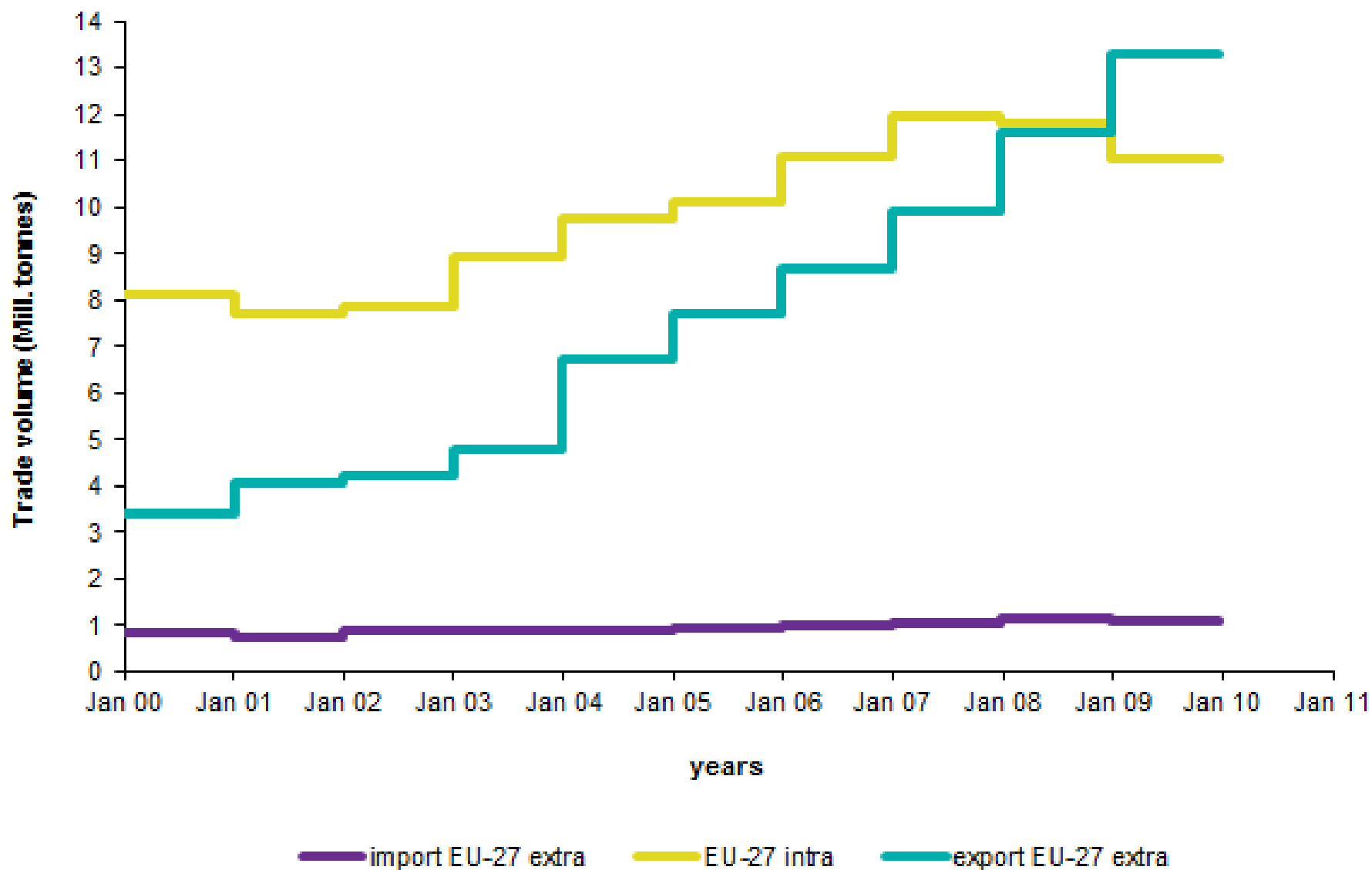
Trade volume of paper waste in EU-27



Source: Eurostat

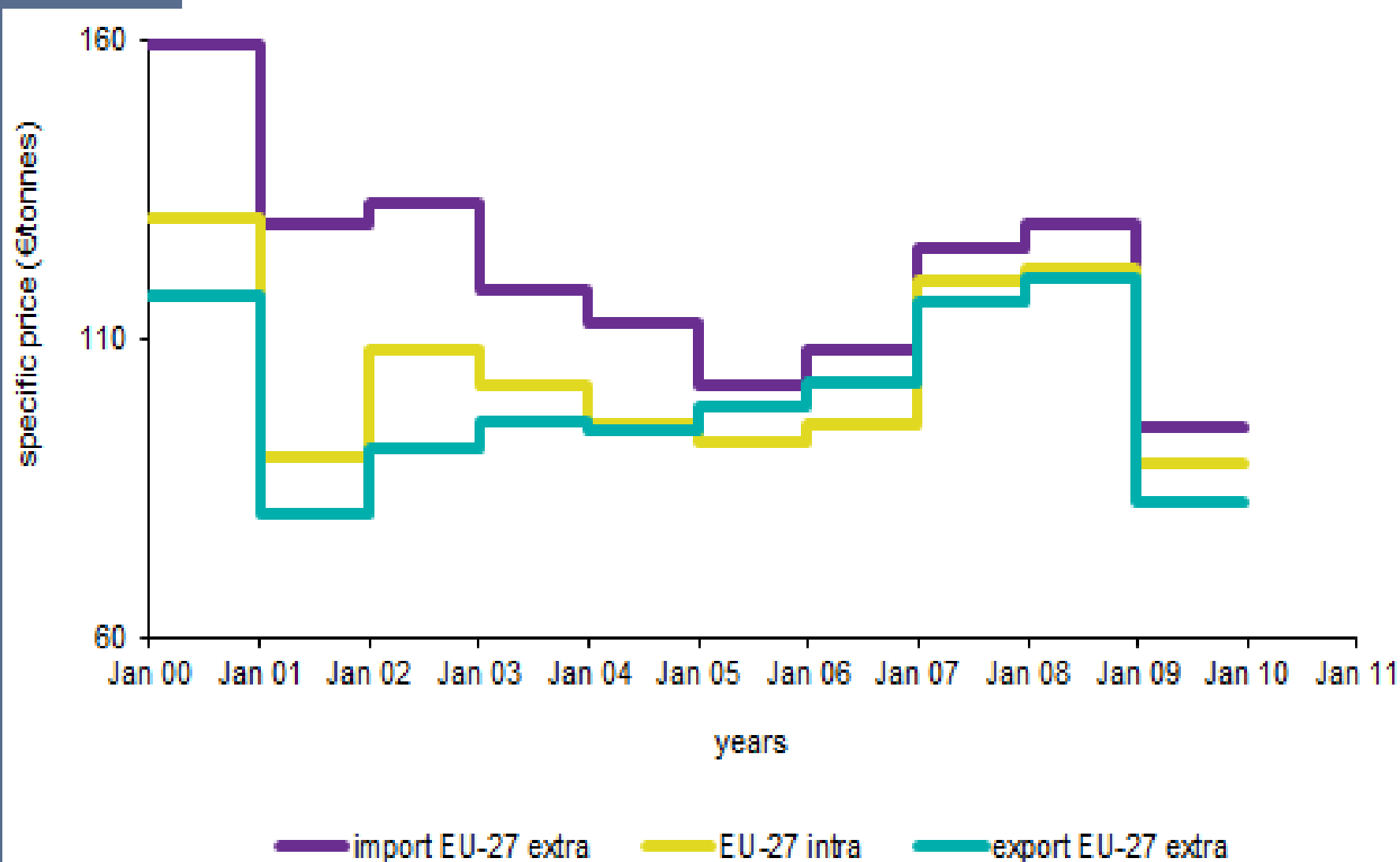
Trade volume of paper waste in EU-27 according to trade flows

Where does waste paper go?



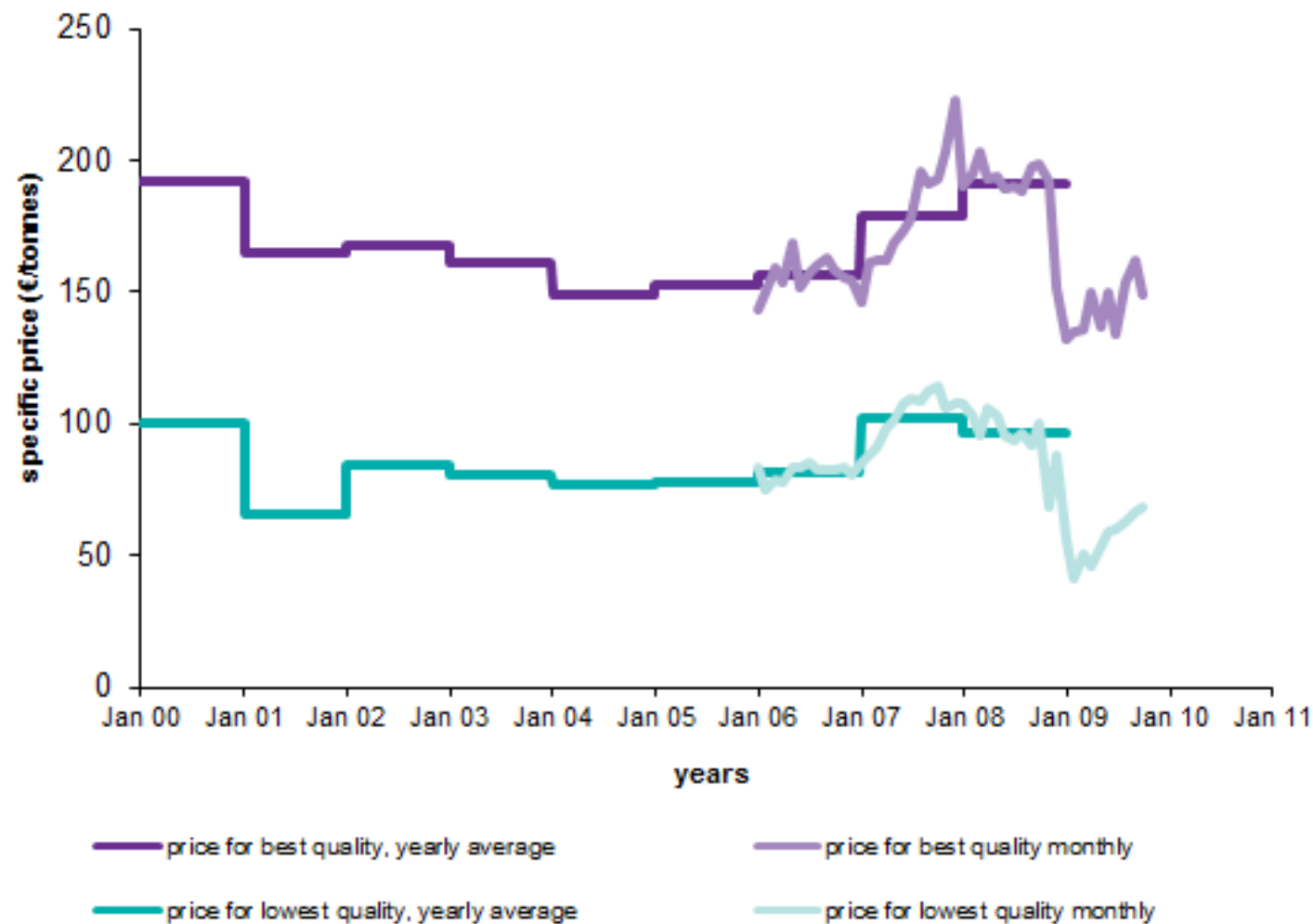
Source: Eurostat

Waste paper streams and prices



Source: Eurostat

Price/Quality flows



Source: Eurostat

National end of waste criteria

- **Solid fuel:**
 - Decree on the recycling of non-hazardous waste into solid fuel, Official Gazette RS no. 57/2008
- **Biodegradable waste (compost and digestate):**
 - Decree on the treatment of biodegradable waste, Official Gazette RS no. 99/2013

Extended producer responsibility

- Post consumer responsibility for the product after it becomes waste
 - acceptance of returned products or waste remains
 - waste management
 - financial responsibility
- ⇒
- (eco)design for reuse, recycling, resource efficiency..

The OECD *defines* EPR as an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle. An EPR policy is characterised by:

- (1) the shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities; and
- (2) (2) the provision of incentives to producers to take into account environmental considerations when designing their products. While other policy instruments tend to target a single point in the chain, EPR seeks to integrate signals related to the environmental characteristics of products and production processes throughout the product chain.

The packaging and waste packaging directive

- free movement of goods
- extended producer responsibility
- essential requirements

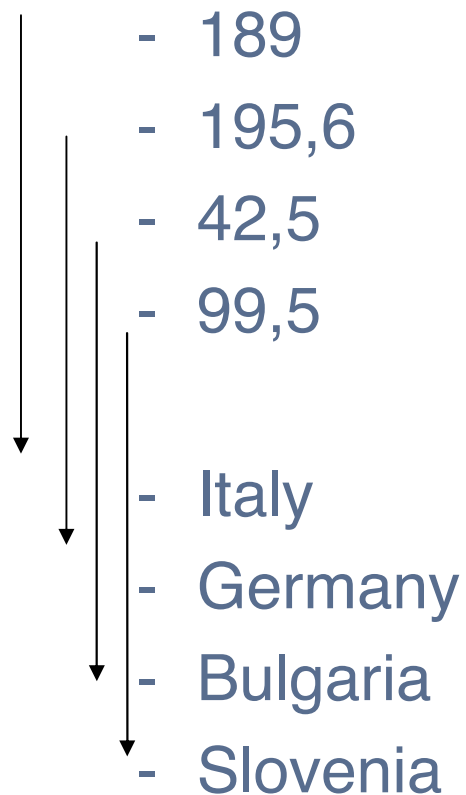
a case of danish
bottles



compromises
will be
required

The numbers

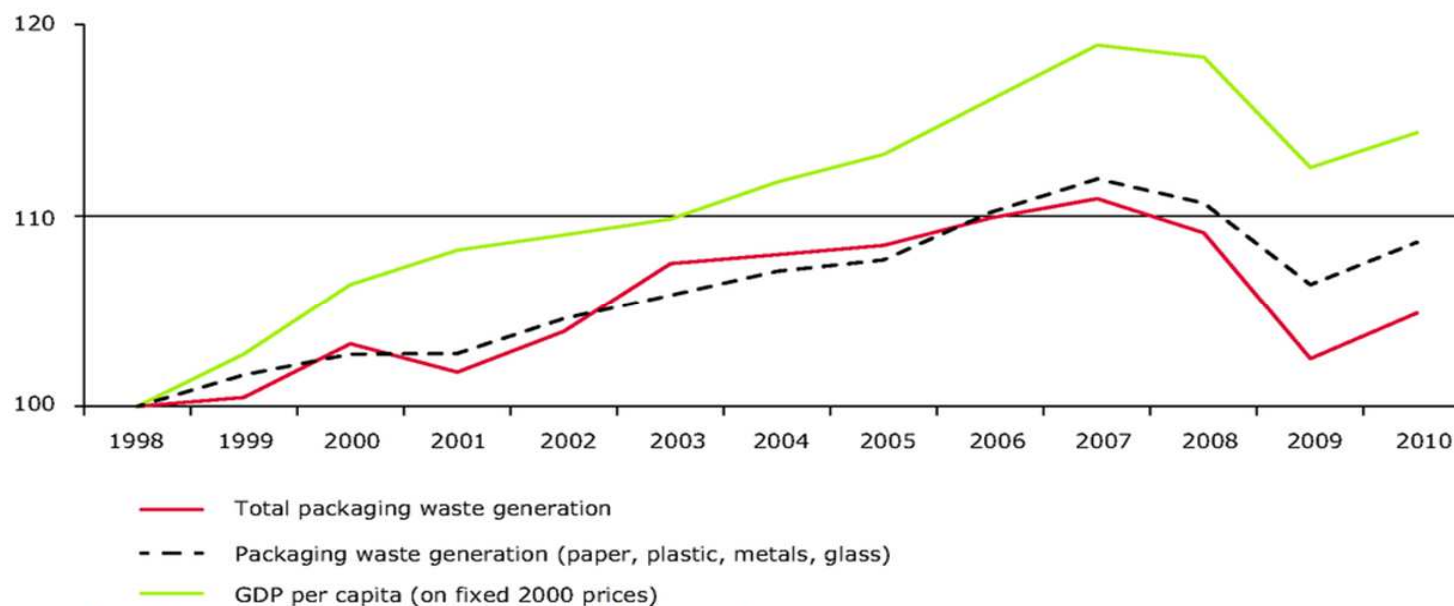
- kg waste packaging per capita per year



Packaging waste vs GDP

Fig. 3: Generation of packaging waste and GDP in the EU-15

Index
(1998=100)

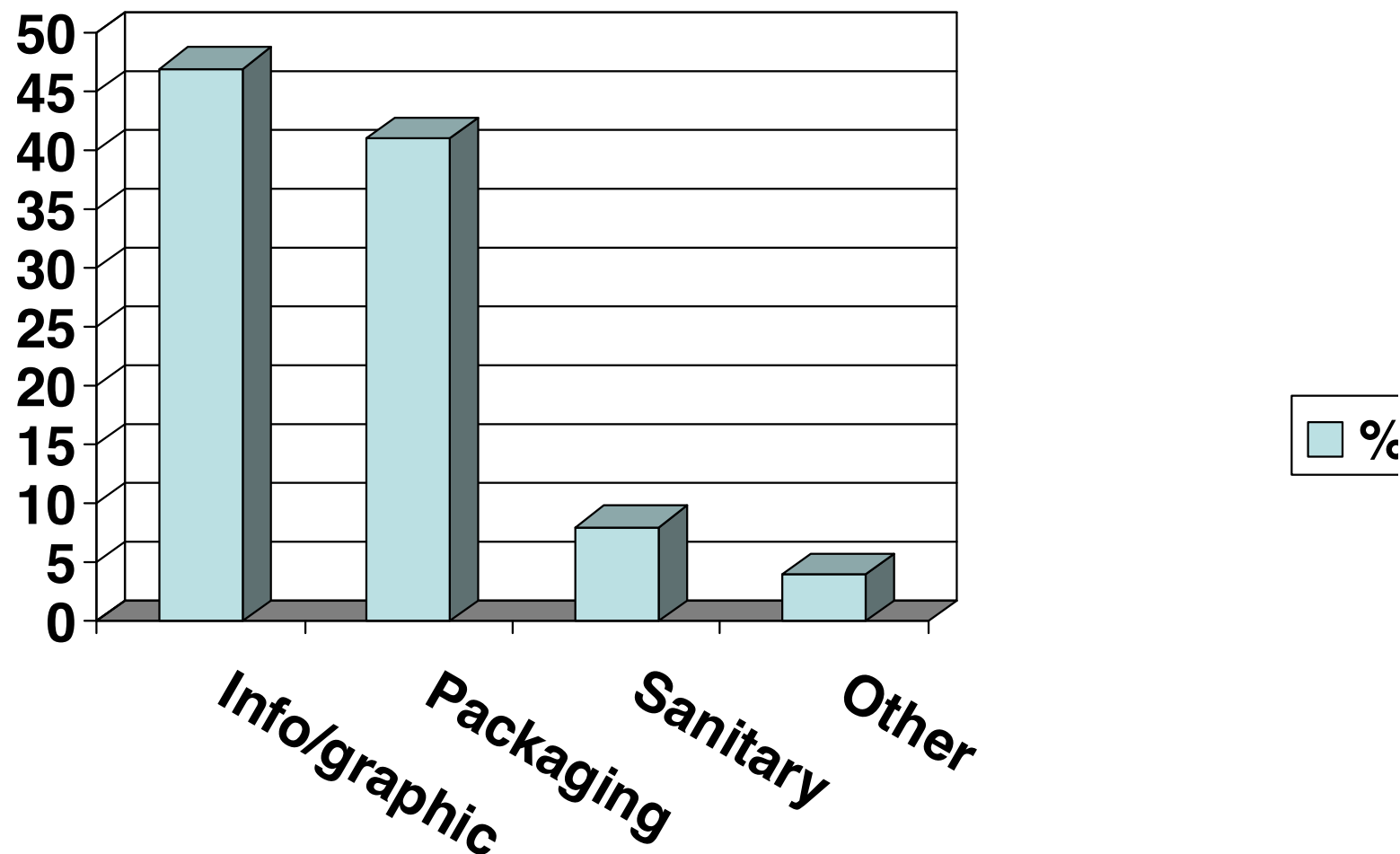


Note: The figure shows the generation of packaging waste and GDP in the EU-15 countries from 1998-2010

Data source:

- Population statistics (Eurostat) provided by Eurostat - Statistical Office of the European Union (ESTAT)
- GDP and main components - volumes (Eurostat) provided by Eurostat - Statistical Office of the European Union (ESTAT)
- Data on packaging and packaging waste (Eurostat) provided by Eurostat - Statistical Office of the European Union (ESTAT)

Is paper packaging an important waste stream?



Source: JRC-IPTS, 2011- End of waste
criteria for paper

Waste paper Slovenia

Source: Operative program on municipal waste management, 13. March 2013

Waste paper	2011		Targets 2012	
	%	t/year	%	t/year
	69,3	141.676	82	173.497

Prevention of waste (2008/98/EC)

- technologies for durable, re-useable and recyclable products
- decoupling GDP/waste
- example: the essential requirements in the packaging and waste packaging standards

The packaging and waste packaging standards

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)

umbrella standard: (EN 13427)

What are the essential requirements?

• minimisation and prevention obligatory

• reusable packaging optional

• recoverable packaging

- material recycling

- energy recovery

- composting

- biodegradable decomposition to carbon dioxide, biomass and water

one choice
is obligatory!

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..

Know your product!

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

Consider design requirements!

- food packaging represents around 50% of packaging
 - enables our way of life
 - overpackaging by 10% \Rightarrow
-
- underpackaging by 10%
 \Rightarrow 100 % waste

Know your packaging (material)!

- shape
- thickness
- tolerances
- size
- feasibility
- tooling specifications
- waste management
 - hazardous substances
 - Hg, Cr⁶⁺, Cd, Pb limits

Know your process (Packing/Filling)

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

Logistics

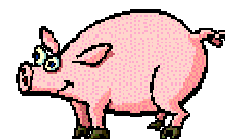
transport, storage and handling

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

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, auxiliary 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

User/consumer acceptance

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

Information

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

Safety

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

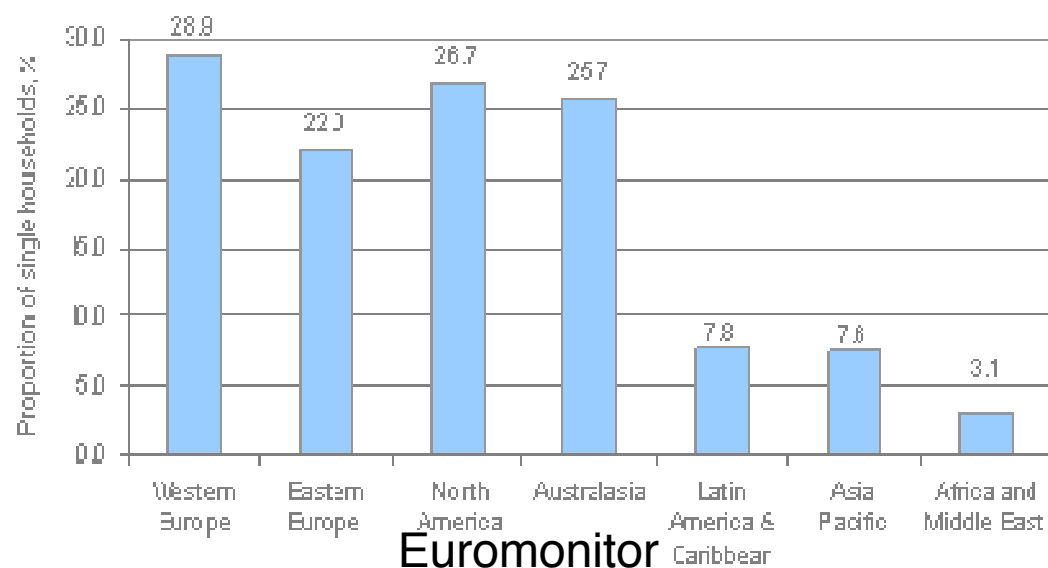
Other legislation

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



Other influences

- economic,
- social,
- environmental



A never ending story!

- Packaging improvement is a continuous process
 - new packaging materials
 - better quality of existing materials,
 - cheaper materials
 - new machinery
 - ...

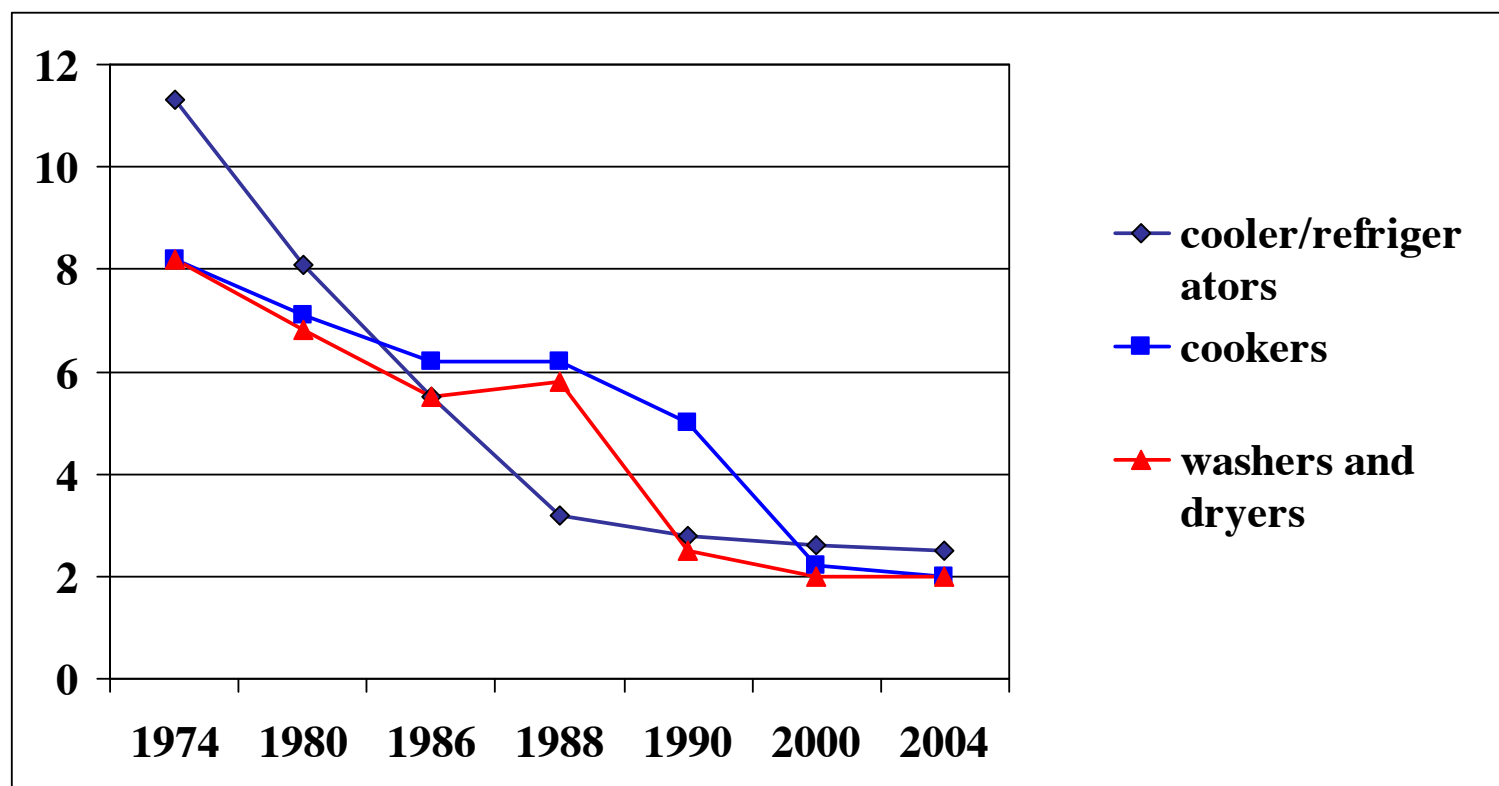
Benefits for companies may be

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

ht/h. unit (example Gorenje)

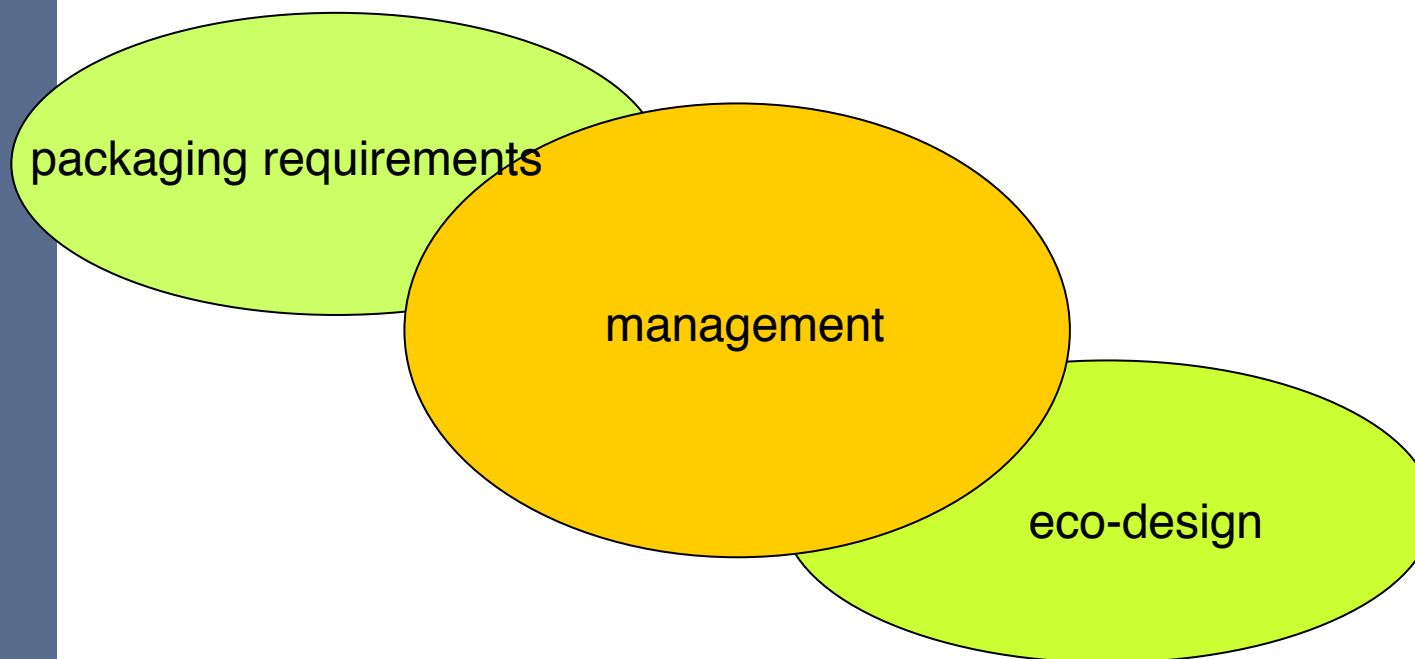
from ~ 9 kg/HU (1974) to ~ 2 kg/HU (2000-2004)

kg/HU

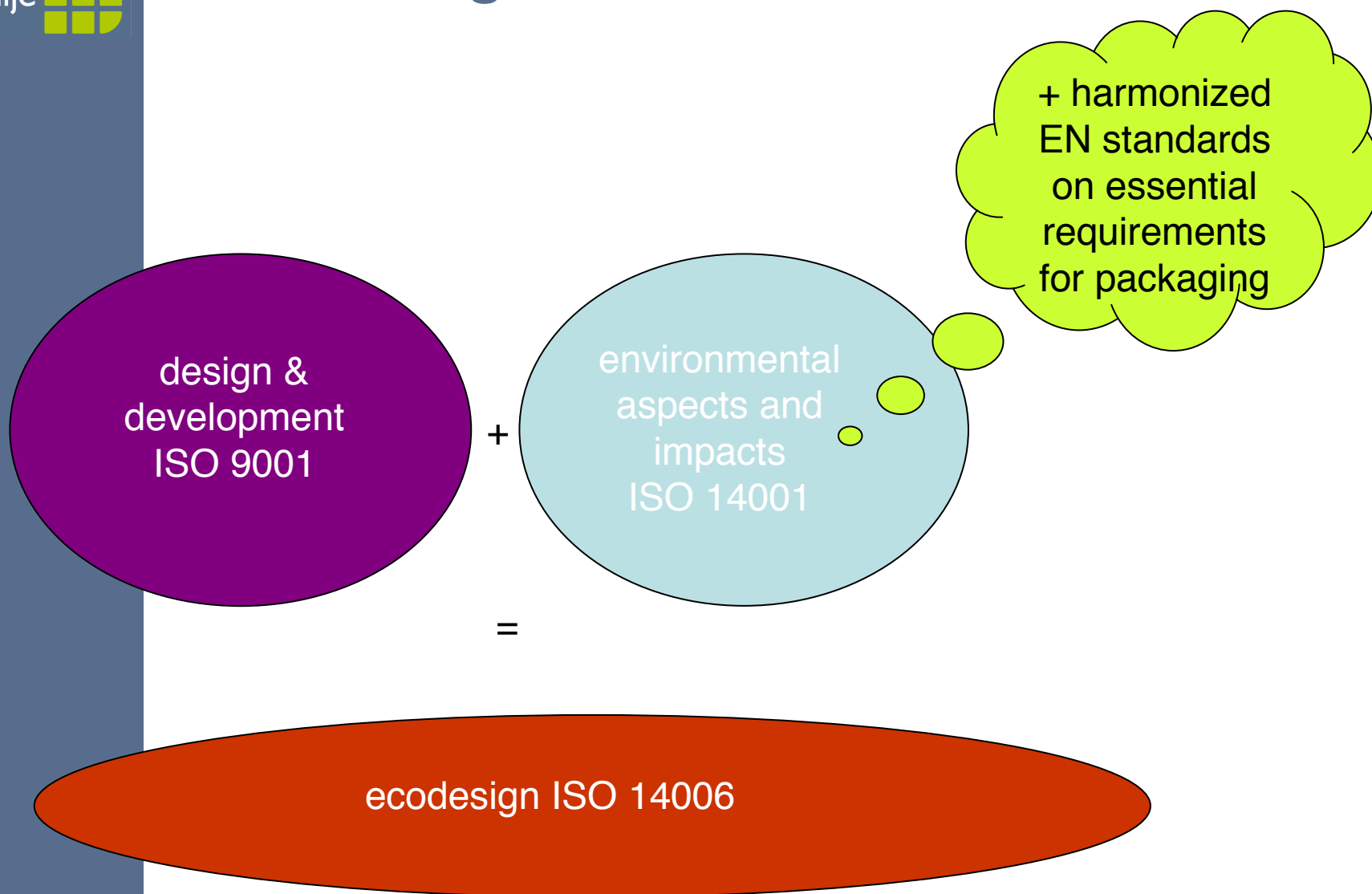




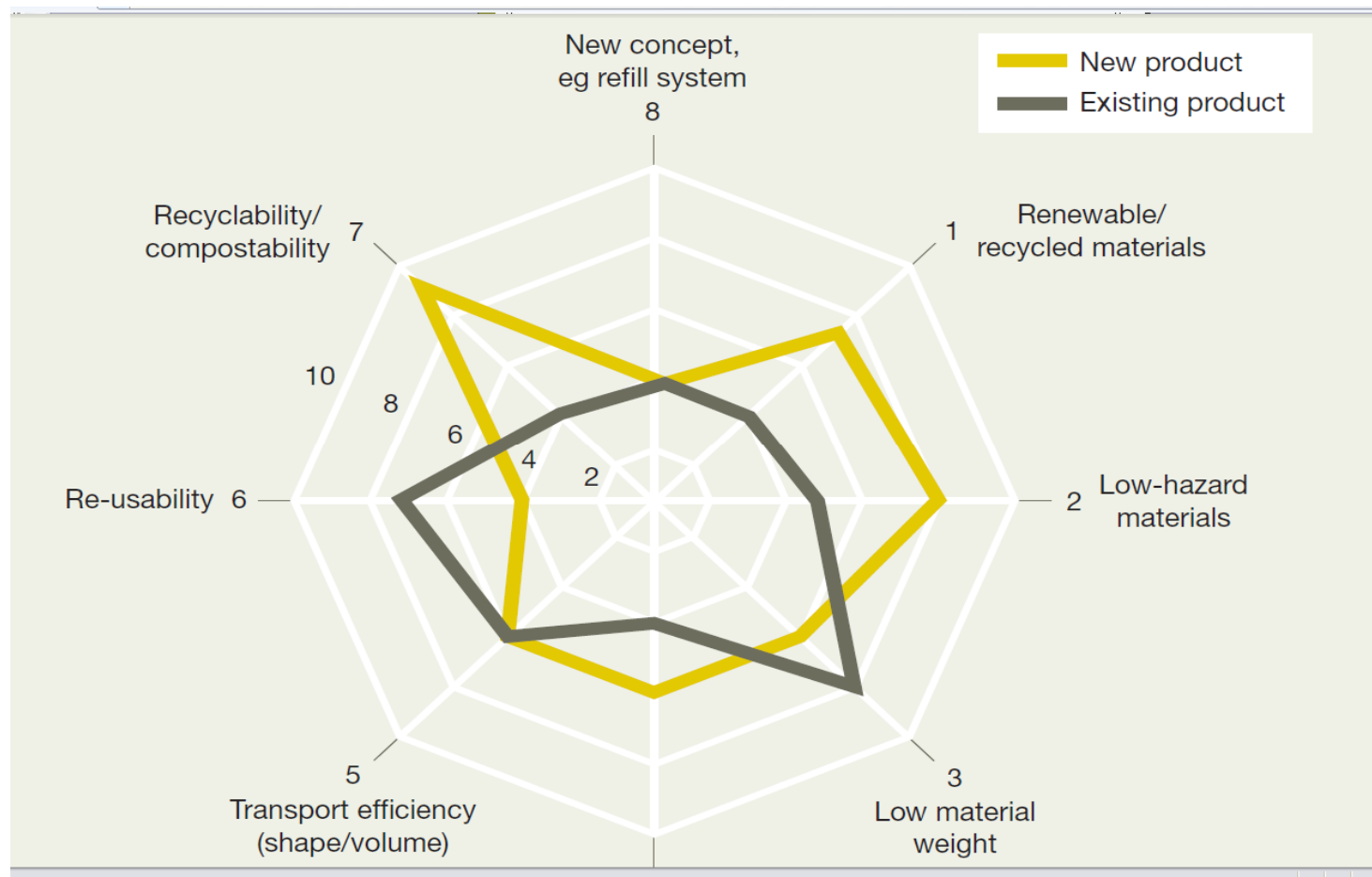
Essential requirements & ecodesign



It's management



decisions, decisions?



spider diagramme or
ecowheel

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%

It's not black and white or static

Re-use and recycling

- the targets (Directive 2008/98/EC)
 - by 2020 preparation for reuse and the recycling of paper, metal, plastic and glass from households shall be increased to a minimum overall 50% by weight
- packaging targets by weight 2008 (Directive 94/62/EC)
 - 60 % glass;
 - 60 % paper and board;
 - 50 % metals;
- 22,5 % plastics, counting exclusively material that is recycled back into plastics;
 - 15 % wood.

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

Recovery (2008/98/EC)

- the waste hierarchy
- protection of human health and the environment
- when waste is recovered check REACH requirements!

REACH Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006

Guidance on waste and recovered substances

Recovered paper and REACH

- EINECS identifies cellulose pulp as follows: *"The fibrous substances obtained from the treatment of lignocellulosic substances (wood or other agricultural fiber sources) with one or more aqueous solutions of pulping and/or bleaching chemicals. Composed of cellulose, hemicellulose, lignin, and other minor components. The relative amounts of these components depend on the extent of the pulping and bleaching processes."* (EINECS number 265-995-8).
- Cellulose pulp is listed in Annex IV, and consequently, exempted from registration, downstream user and evaluation obligations. Recovered paper may contain other constituents such as pigments, inks, glues, fillers etc. Regarding the recovery and recycling process, constituents that have no specific function in the material (cellulose pulp), can therefore be considered as impurities (see section 2.2.4). Recovered paper consisting exclusively of cellulose pulp with impurities without specific function in the material

Balanced focus

Germany - high recycling rate focus

pictures are symbolic

laminated pouch –
non recyclable

weight = 11 g

waste = 11 g

metal can

weight = 120 g

waste = 24 g

glass jar

weight = 470 g

waste = 94,5 g

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 recycling
 - 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



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
 - $q_{\text{net}} \geq 5 \text{ MJ/kg}$
 - organic content $\geq 50\%$ by weight
 - limited contents of heavy metals or dangerous substances



EN 13432: 2001 – Composting and biodegradation

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



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

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 maximum permitted levels for components (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)		
<p><i>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.</i></p>			
Statement of conformity			
<p>In light of the assessment results recorded in part I above, this packaging is claimed to comply with the requirements of EN 13427</p>			
Signed on behalf of (Name and address of supplier)			
Signature:			
Position		Date	

Disposal (Directive 2008/98/EC)

- safe disposal
- where waste does not undergo recovery – final option
- the landfill directive 1999/31/EC
- the waste incineration directive now included in the industrial emissions directive 2010/75/EU together with previous TiO_2 directives, VOC, IPPC and large combustion plants

Future issues

- municipal waste??
- producer responsibility organisations??
waste as a resource!
- industrial symbiosis??

thank you for your attention!