



# PACKALL

PackAlliance:  
European alliance for innovation training  
& collaboration towards future packaging

Linking **Academy** to **Industry**.

## Training program: modules

- **Eco-design & novel manufacturing processing**
  - New materials and biomaterials
  - Citizen and Consumer Engagement
  - Residue management and valorisation



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# Legislation – Part1

In 90s, people realized that the waste collection system need a regulation that foster their significantly lower environmental impact.

Most industrial sectors were involved:

- **Packaging**
- **Automotive**
- **E&E**
- ....

In the last years, even the textile sector is facing its green revolution!

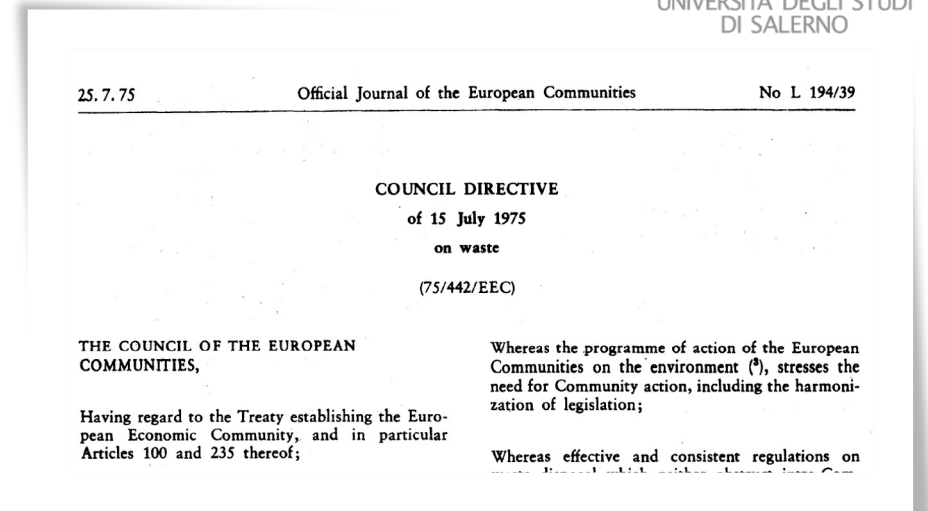
## When we started?





## Directive 75/442/CEE on waste

- Push the member states to take the necessary **measures to ensure that any holder of waste handled it correctly** (e.g. by a waste collector)
- Promotes the necessary measures to ensure that **waste is disposed without endangering human health** and without harming the environment,
  - Push the member states to take appropriate steps to **encourage the prevention, recycling and processing of waste**, the extraction of raw materials and possibly of energy and any other process for the re-use of waste (Article 3)

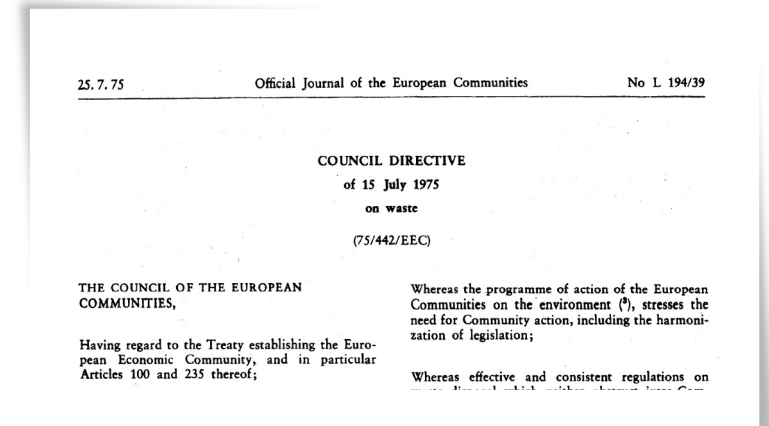


Still more focused on **handling** waste rather than **reducing** waste!



## Several definitions have been set

- **waste**: any substance or object which the holder discards or intends or is required to discard.
- **producer**: anyone whose activities produce waste ("original producer") and/or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste
- **management**: collection, transport, recovery and disposal of waste, including the supervision of such operations and after-care of disposal sites;





## Directive 91/156/CEE on waste

(amending Directive 75/442/EEC)

More attention to reduction of waste production

### *Article 3*

1. Member States shall take appropriate steps to encourage the prevention, recycling and processing of waste, the extraction of raw materials and possibly of energy therefrom and any other process for the re-use of waste.



### *Article 3*

1. Member States shall take appropriate measures to encourage :
  - (a) firstly, the prevention or reduction of waste production and its harmfulness, in particular by :
    - the development of clean technologies more sparing in their use of natural resources,
    - the technical development and marketing of products designed so as to make no contribution or to make the smallest possible contribution, by the nature of their manufacture, use or final disposal, to increasing the amount or harmfulness of waste and pollution hazards,
    - the development of appropriate techniques for the final disposal of dangerous substances contained in waste destined for recovery ;
  - (b) secondly :
    - (i) the recovery of waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw materials, or
    - (ii) the use of waste as a source of energy.

Waste management of packaging products is of paramount importance, as the service life is very short.

## Directive 94/62/CE on packaging and packaging waste

- Promotes measures to **prevent the formation** of packaging waste
- **Encourages reuse** systems of packaging, which can be reused in an environmentally sound manner
- Sets up the following **targets**:
  - no later than **five years, 50-65wt% of the packaging waste will be recovered** (25-45wt% recycled)
  - encourage the **use of materials obtained from recycled packaging waste**



No L 365/10 Official Journal of the European Communities 31. 12. 94

### EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE 94/62/EC of 20 December 1994 on packaging and packaging waste

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF  
THE EUROPEAN UNION,

Having regard to the Treaty establishing the European  
Community, and in particular Article 100a thereof,

Having regard to the proposal from the Commission <sup>(1)</sup>,

Having regard to the opinion of the Economic and Social  
Committee <sup>(2)</sup>,

Whereas this Directive should cover all types of  
packaging placed on the market and all packaging waste;  
whereas, therefore, Council Directive 85/339/EEC of 27  
June 1985 on containers of liquids for human  
consumption <sup>(3)</sup> should be repealed;

Whereas packaging has a vital social and economic  
function and therefore measures provided for in this  
Directive should apply without prejudice to other  
relevant legislative requirements affecting quality and  
transport of packaging or packaged goods;



## Different guidelines were designed

1. **Production:** weight and volume reduction
2. **Reuse:** evaluation with respect to single use solutions
3. **Mechanical recycling:** mono-material packaging should be the first choice (whenever possible)
4. **Waste management:** fostering separate collection
5. **Innovation:** improving quality and efficiency of packaging
6. **Logistics and energy consumption:** continuous monitoring



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## ***Requirements specific to the recoverable nature of packaging***

### Packaging recoverable in the form of **material recycling**

*Packaging must be manufactured in such a way as to enable the recycling of a certain percentage by weight of the materials used into the manufacture of marketable products. The establishment of this percentage may vary, depending on the type of material of which the packaging is composed.*

### Packaging recoverable in the form of **energy recovery**

*Packaging waste processed for the purpose of energy recovery shall have a minimum inferior calorific value to allow optimization of energy recovery.*

### Packaging recoverable in the form of **composting**

*Packaging waste processed for the purpose of composting shall be of such a biodegradable nature that it should not hinder the separate collection and the composting process or activity into which it is introduced.*

### **Biodegradable** packaging

*Biodegradable packaging waste shall be of such a nature that it is capable of undergoing physical, chemical, thermal or biological decomposition such that most of the finished compost ultimately decomposes into carbon dioxide, biomass and water.*

## Directive 2004/12/EC on packaging and packaging waste

Directive 2004/12/EC updated the recovery and recycling targets (new deadline: end of 2008):

- Recovery of the packaging waste: 60%
- Recycling: 55-80wt%, specifically:
  - Glass and cellulose: 60%
  - Metals (Al and Fe): 50%
  - **Plastics: 22.5%**
  - Wood: 15%





The following CEN (European Committee for Standardization) standards are the **reference to demonstrate the compliance to the essential requirements set by Directive 94/62/CE and Directive 2004/12/EC:**

**EN 13427:2004**

*Packaging - Requirements for the use of European Standards in the field of packaging and packaging waste*

**EN 13428:2004**

*Packaging - Requirements specific to manufacturing and composition - Prevention by source reduction*

**EN 13429:2004**

*Packaging – Reuse*

**EN 13430:2004**

*Packaging - Requirements for packaging recoverable by material recycling*

**EN 13431:2004**

*Packaging - Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value*

**EN 13432:2000**

*Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging*



## EN 13427:2004

*Packaging - Requirements for the use of European Standards in the field of packaging and packaging waste (the “umbrella” standard)*

This European Standard specifies **requirements and a procedure** by which a person or organization responsible for placing packaging or packed product on the market (the supplier) may combine the application of five (mandated) packaging standards and one (mandated) CEN report (in two parts).



## EN 13428:2004

*Packaging - Requirements specific to manufacturing and composition - Prevention by source reduction*

This European Standard specifies a procedure for assessment of packaging to ensure that the **weight and/or volume of its material content is at the minimum** commensurate with the maintenance of:

- **functionality** throughout the supply and user chain ;
- **safety** and hygiene for both product and user/consumer ;
- **acceptability** of the packed product to the user/consumer.

This European Standard also specifies the methodology and procedure for **determining the presence of the four heavy metals** named in article 11 of the packaging and packaging waste Directive 94/62/EC and for determining the presence and minimisation of any dangerous substances or preparations.



### **EN 13429:2004**

#### *Packaging – Reuse*

This European Standard specifies the requirements for a packaging to be **classified as reusable** and sets out procedures for assessment of conformity with those requirements including the associated systems.

### **EN 13430:2004**

#### *Packaging - Requirements for packaging recoverable by material recycling*

This standard specifies the requirements for packaging to be classified as **recoverable in the form of material recycling** whilst accommodating the continuing development of both packaging and recovery technologies and sets out procedures for assessment of conformity with those requirements.



### EN 13431:2004

*Packaging - Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value*

This European Standard specifies the requirements for a packaging to be classified as **recoverable in the form of energy** and sets out procedures for assessment of conformity with those requirements. The scope is limited to factors under the control of the supplier.



## EN 13432:2000

*Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging*

This European Standard specifies requirements and procedures to determine the compostability and anaerobic treatability of packaging and packaging materials by addressing four characteristics: 1) biodegradability; 2) disintegration during biological treatment; 3) effect on the biological treatment process; 4) effect on the quality of the resulting compost. In case of a packaging formed by different components, some of which are compostable and some other not, the packaging itself, as a whole is not compostable.





The **Decision 97/129/EC** establishes the identification system for packaging materials.

This Decision, which covers all packaging covered by Directive 94/62/EC aims to establish the numbering and abbreviations on which the identification system is based, indicating the nature of the packaging material(s) used and specifying which materials shall be subject to the identification system.

L 47/26 EN Official Journal of the European Union 18.2.2004

DIRECTIVE 2004/12/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
of 11 February 2004  
amending Directive 94/62/EC on packaging and packaging waste

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 95(1) thereof,

Having regard to the proposal from the Commission <sup>(1)</sup>,

Having regard to the opinion of the European Economic and Social Committee <sup>(2)</sup>,

Acting in accordance with the procedure laid down in Article 251 of the Treaty, in the light of the joint text approved by the

(5) Certain Member States which, on account of their special circumstances, were allowed to postpone the date fixed for achievement of the recovery and recycling targets set in Directive 94/62/EC should be granted a further, but limited, postponement.

(6) The European Parliament, the Council and the Commission agree on the need for temporary derogations for the acceding States with respect to the targets of this Directive. This should be decided on the basis of the requests from the acceding States for derogations to run in principle until not later than 2012 for Cyprus, the Czech Republic, Estonia, Hungary, Lithuania, Slovakia and Slovenia; 2013 for Malta; 2014 for Poland and





## Numbering and abbreviation system (!) for plastics

Material	Abbreviations	Numbering
Polyethylene terephthalate	PET	1
High density polyethylene	HDPE	2
Polyvinyl chloride	PVC	3
Low density polyethylene	LDPE	4
Polypropylene	PP	5
Polystyrene	PS	6
		7















## Numbering and abbreviation system (!) for paper and fibreboard

Material	Abbreviation	Numbering
Corrugated fibreboard	PAP	20
Non-corrugated fibreboard	PAP	21
Paper	PAP	22
		23

## Numbering and abbreviation system for metals

Material	Abbreviation	Numbering
Steel	FE	40
Aluminium	ALU	41

## Plastic Resin Identification Codes

 <b>PETE</b>	 <b>HDPE</b>	 <b>PVC</b>	 <b>LDPE</b>	 <b>PP</b>	 <b>PS</b>	 <b>OTHER</b>
<b>Polyethylene Terephthalate</b>	<b>High-Density Polyethylene</b>	<b>Polyvinyl Chloride</b>	<b>Low-Density Polyethylene</b>	<b>Polypropylene</b>	<b>Polystyrene</b>	<b>Other</b>
<p><b>Common products:</b> soda &amp; water bottles; cups, jars, trays, clamshells</p> <p><b>Recycled products:</b> clothing, carpet, clamshells, soda &amp; water bottles</p> 	<p><b>Common products:</b> milk jugs, detergent &amp; shampoo bottles, flower pots, grocery bags</p> <p><b>Recycled products:</b> detergent bottles, flower pots, crates, pipe, decking</p> 	<p><b>Common products:</b> cleaning supply jugs, pool liners, twine, sheeting, automotive product bottles, sheeting</p> <p><b>Recycled products:</b> pipe, wall siding, binders, carpet backing, flooring</p> 	<p><b>Common products:</b> bread bags, paper towels &amp; tissue overwrap, squeeze bottles, trash bags, six-pack rings</p> <p><b>Recycled products:</b> trash bags, plastic lumber, furniture, shipping envelopes, compost bins</p> 	<p><b>Common products:</b> yogurt tubs, cups, juice bottles, straws, hangers, sand &amp; shipping bags</p> <p><b>Recycled products:</b> paint cans, speed bumps, auto parts, food containers, hangers, plant pots, razor handles</p> 	<p><b>Common products:</b> to-go containers &amp; flatware, hot cups, razors, CD cases, shipping cushion, cartons, trays</p> <p><b>Recycled products:</b> picture frames, crown molding, rulers, flower pots, hangers, toys, tape dispensers</p> 	<p><b>Common types &amp; products:</b> polycarbonate, nylon, ABS, acrylic, PLA; bottles, safety glasses, CDs, headlight lenses</p> <p><b>Recycled products:</b> electronic housings, auto parts,</p> 

Source: [www.purewatertech.com](http://www.purewatertech.com)



The Directive 2008/98/EC on waste introduced **two different concepts**: one related to a material which is waste and cease to be waste, one related to a material which was supposed to become waste but may not.

1. **End-of-waste status**
2. **By-products**

In order to make it possible, certain conditions must be fulfilled.

This is of paramount importance to promote the reduction of waste and the recycling



## End-of-waste status

Certain specified waste shall cease to be waste when it has undergone a recovery, including recycling, operation and complies with specific criteria to be developed in accordance with the following conditions:

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





## By-product

A substance or object, resulting from a production process, the primary aim of which is not the production of that item, may be regarded as not being waste but as being a by-product only if the following conditions are met:

- (a) further use of the substance or object is certain;
- (b) the substance or object can be used directly without any further processing other than normal industrial practice;
- (c) the substance or object is produced as an integral part of a production process;
- (d) 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.

## Waste hierarchy

The Directive establish also a **waste hierarchy** to be applied as a priority order in waste prevention and management legislation and policy:

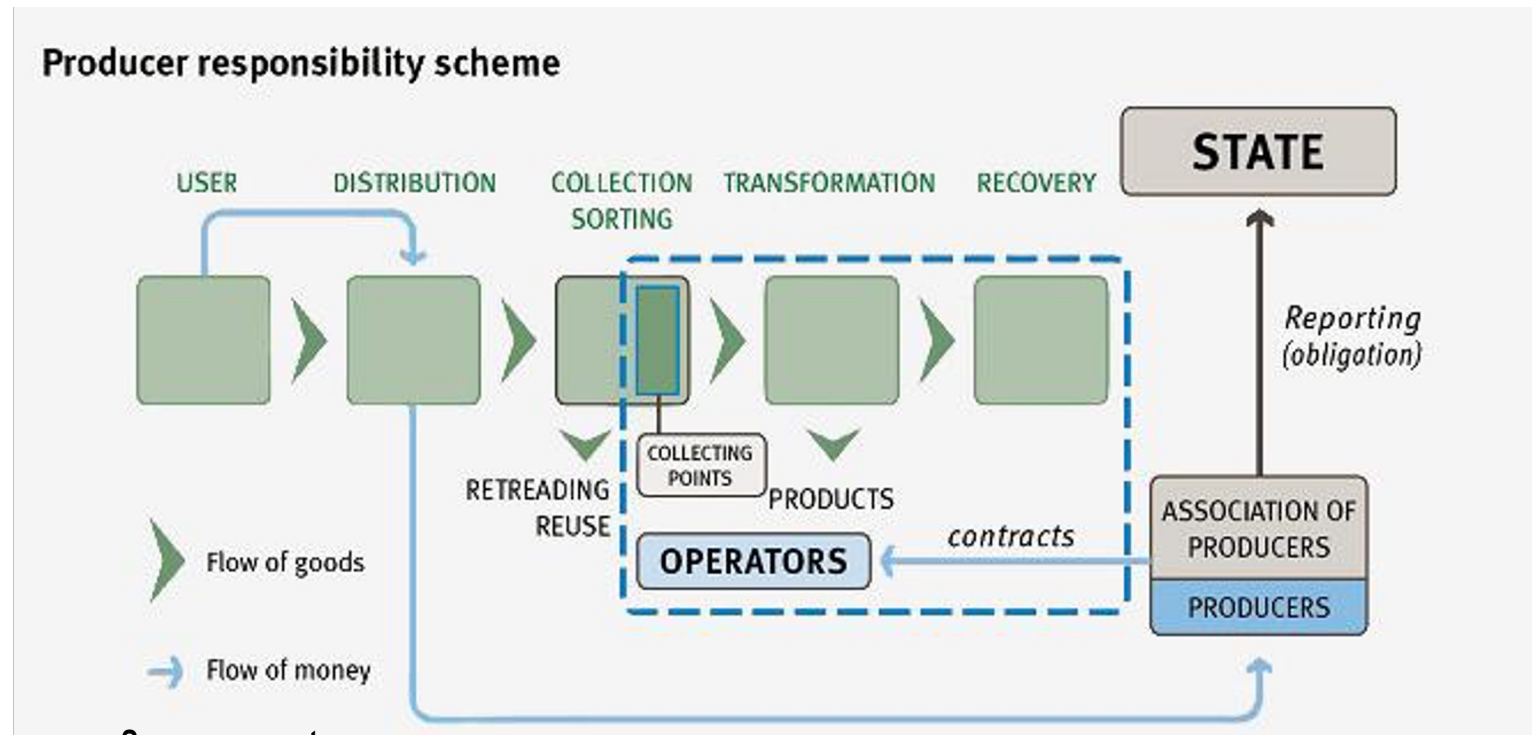
- (a) prevention;
- (b) preparing for re-use;
- (c) recycling;
- (d) other recovery, e.g. energy recovery;
- (e) disposal.



Source: Regioneambiente.it

## Extended producer responsibility

The Directive also introduces the concept of extended producer responsibility, which consists in ensuring that all the industrial producers are responsible for the waste management of their products/processes/...



Source: [www.etrma.org](http://www.etrma.org)



## Setting new targets for waste

The Directive establish also new targets for waste (by 2020):

- Recovery of the packaging waste: 70%
- Recycling: 50wt% for all materials

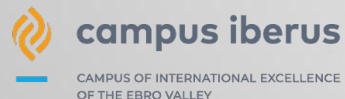




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