Progettare imballaggio: esigenze e soluzioni

UNINDUSTRIA TREVISO

Treviso 29 Novembre 2912

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LIFE CYCLE ENGINEERING

Life Cycle Engineering (LCE) is a consulting& research company that from early nineties works on the **SUSTAINABILITY** issue

- more than15 years of experience on specific fields (LCA, Eco design, eco-labelling, carbon footprint, environmental communication, environmental law)

LCA Technical Manual
4° edition
Edizioni Ambiente

- more than 100 LCA studies for international clients. Since 2009 in the USA market.
- scientific partner of Polytechnic University of Torino; more than 80 scientific papers
- consultants for DG Environment (UE) and Italian ISPRA for the EU Ecolabel
- consultants for companies, corporations and business/manufacturing associations

LCE is **ISO 9001 certified**

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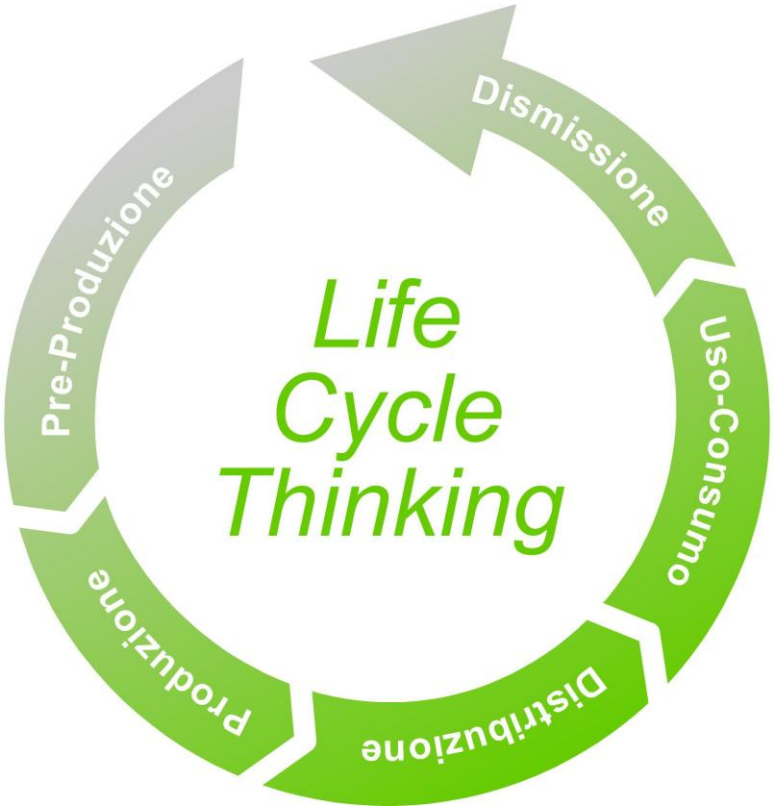
ECODESIGN

L'80% dell'impatto ambientale esercitato dai prodotti viene determinato allo studio progettuale

Design Council 2002



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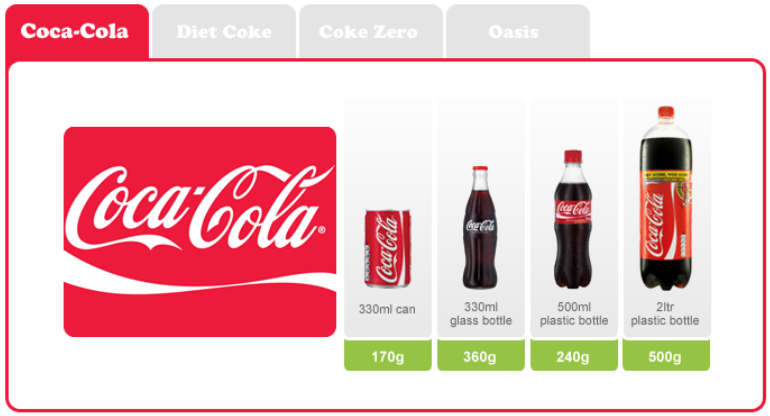
EVOLUZIONE DEL MERCATO

La problematica ambientale è sempre più sentita

I "World trend" che influenzano il mercato del Packaging in EPS sono:

- **SUSTAINABILITY**
- **ENERGY CONSERVATION**
- **SAFETY**

Come reagisce il mercato?



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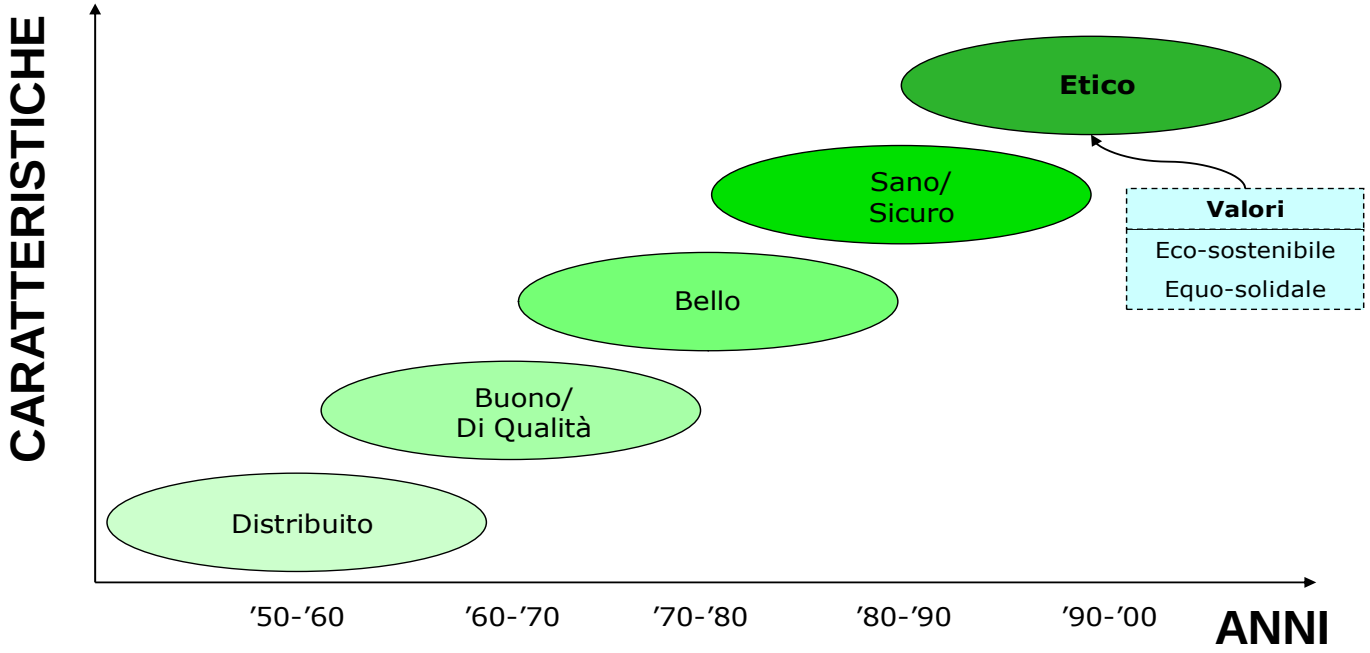
EVOLUZIONE DEL MERCATO

COSA CHIEDE IL MERCATO



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EVOLUZIONE DEL MERCATO

FUNZIONE

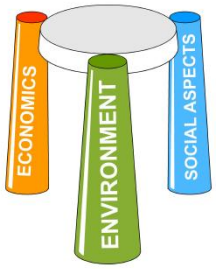
migliora la conservazione del prodotto e aumenta la diffusione

SICUREZZA

tutela della salute del consumatore

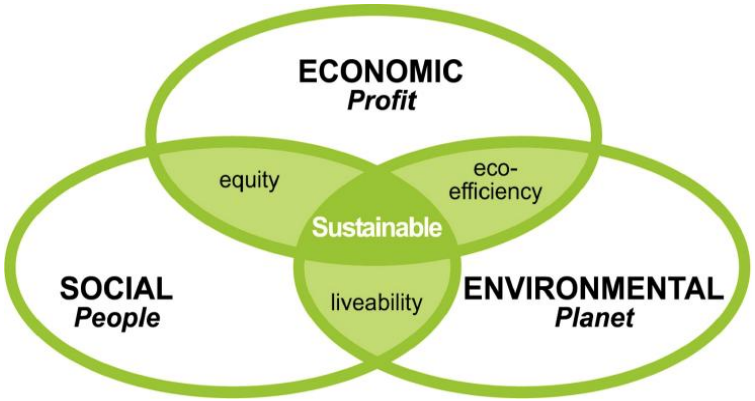
RICICLO

Tutela dell'ambiente



SOSTENIBILITA'

Approccio complessivo tutela degli aspetti economici, ambientali e sociali



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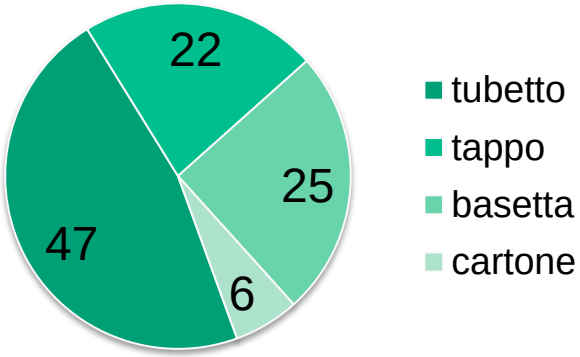
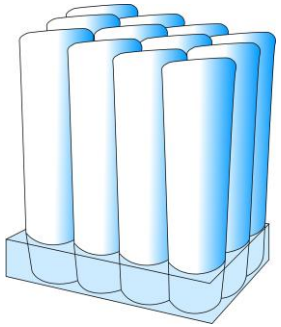
Studiare le strategie di miglioramento

GER



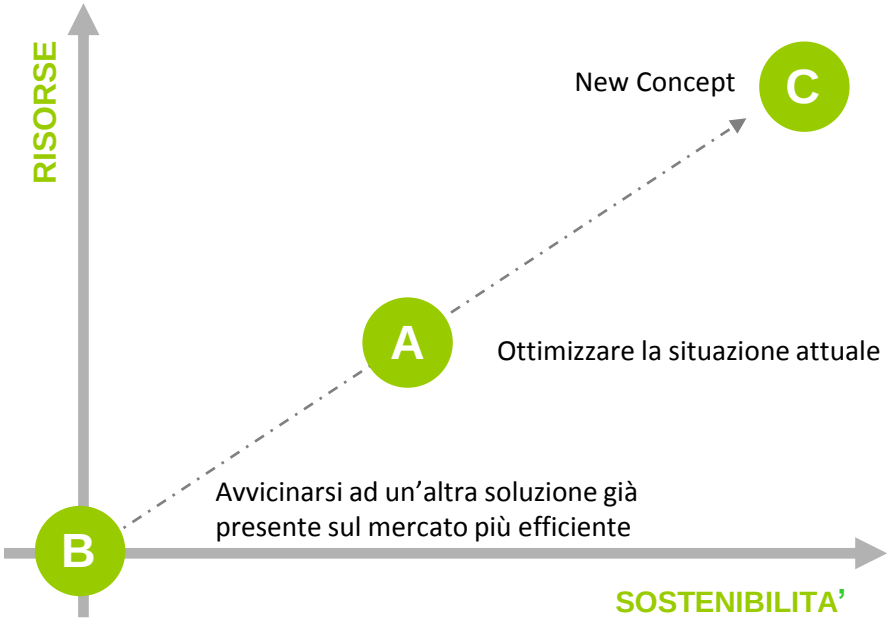


IPOTESI DI MIGLIORAMENTO

A Ottimizzare la situazione attuale

B Avvicinarsi ad un'altra soluzione già presente sul mercato più efficiente

C New Concept



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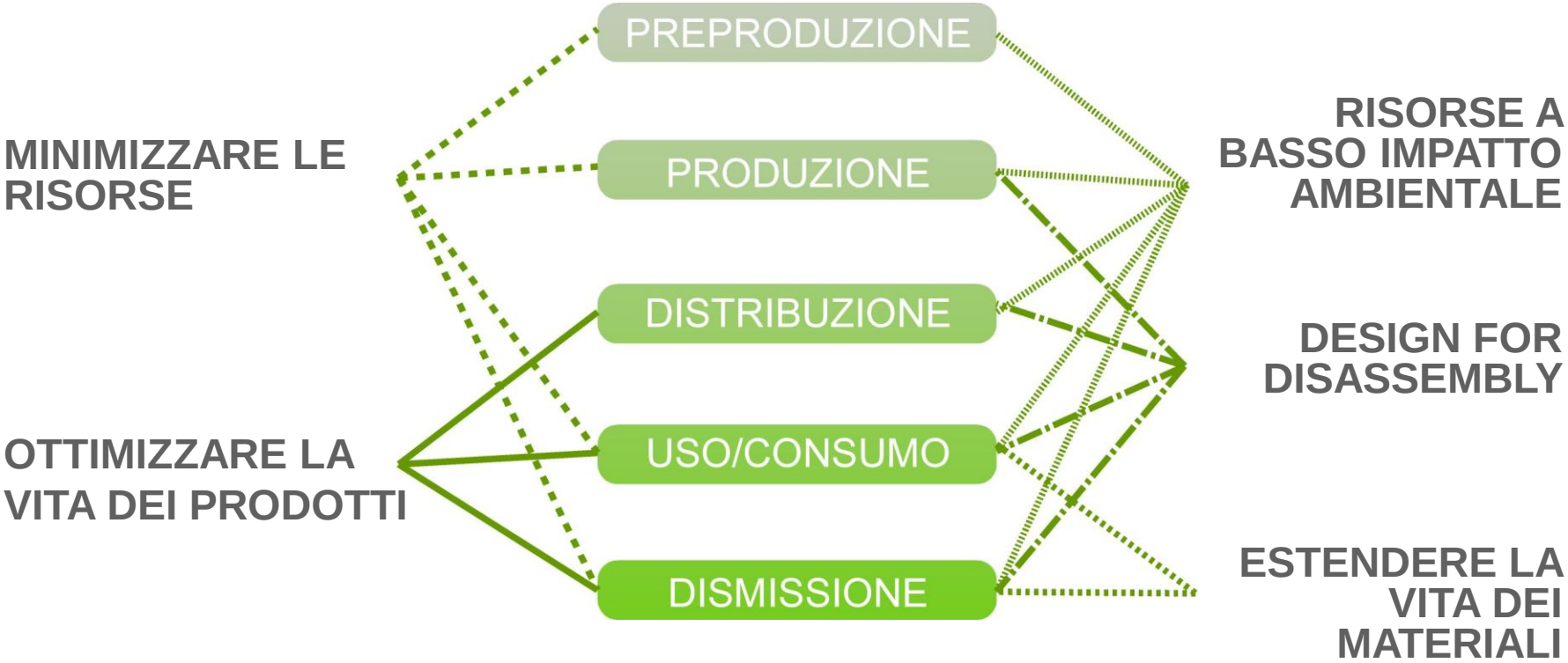
EcoDesign: progettare nuove soluzioni

Linee guida



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Leggerezza

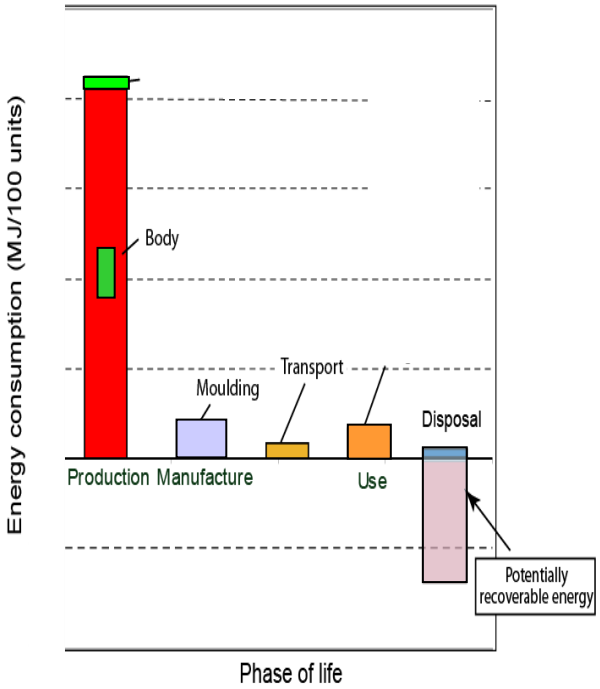
ridurre la quantità di materiale utilizzato

Riduzione dei **consumi** di trasporto e dei **costi**
(ma quanto influisce?)

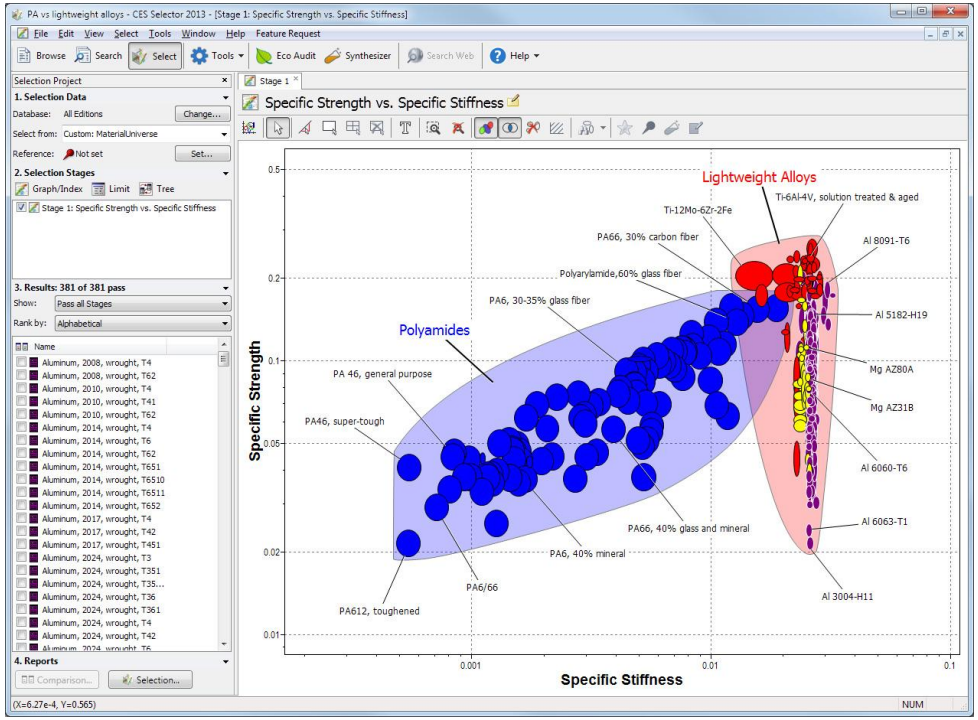
CoopBox Italia SpA

Anno: 2007

vaschetta per il confezionamento di carne avicola introdotta nel 2007 con un **peso inferiore del 20%** rispetto a quella utilizzata in precedenza, mantenendo inalterate le proprietà assorbenti e di resistenza meccanica. Il progetto ha generato una riduzione totale del peso dell'imballaggio pari a circa **100 tonnellate/anno**



Come procedere alla progettazione?



Escludiamo i materiali che non possono "svolgere il lavoro"

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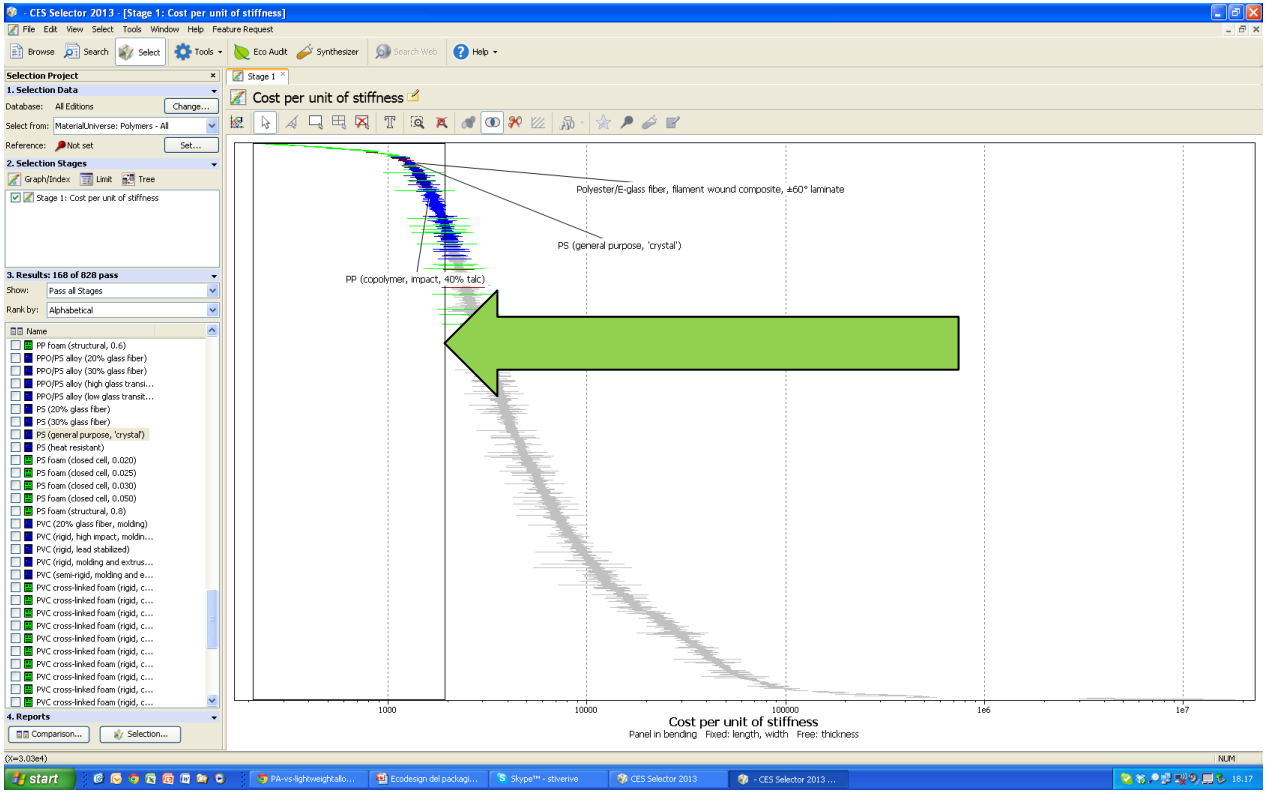
Come procedere alla progettazione?

Classifichiamo i rimanenti in base al parametro da ottimizzare (es. il COSTO per unità di resistenza)



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Come procedere alla progettazione?

Caratterizziamo i materiali candidati in base alla loro “sostenibilità”

Ambientale

Economica

Sociale

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PROPOSTA OPERATIVA

Processo di Ecodesign

Analisi

1a ANALISI SCENARIO
- Analisi contesto
- Definizione nuovo concept

→ *Definizione Linee Guida*

1b ANALISI PRELIMINARE AMBIENTALE
- Eco Audit

→ *Profilo Ecologico Preliminare*

progetto

2a DESIGN PRELIMINARE
- Progettazione in ottica Life Cycle Design:
- Formulazione ipotesi progettuali
- Valutazione ipotesi progettuali

→ *Definizione nuovo prodotto*

2b DESIGN AVANZATO
- Ingegnerizzazione
- Prototipo
- Prove sperimentali

→ *Progetto Esecutivo*

Comunicazione

2c ANALISI AMBIENTALE AVANZATA
- LCA

→ *Profilo Ecologico Completo*

3 COMUNICAZIONE
- Comunicazione Ambientale secondo le Norme ISO 14020

→ *Etichettaura Ambientale*

Eco Audit/LCA

Integrazione dei requisiti ambientali nei requisiti di prodotto / processo / servizio

Concurrent Eco-Design

Comunicazione ambientale

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PROPOSTA OPERATIVA

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→ *Definizione Linee Guida*

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Comunicazione

3 COMUNICAZIONE
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→ *Etichettaura Ambientale*

ANALISI PRELIMINARE AMBIENTALE

- Analisi ambientale su prodotti esistenti
- Analisi delle criticità del sistema attuale
- Linee guida di progetto

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ECODESIGN EcoAudit

Eco Audit: Wind turbine (L12).prd

Eco Audit Project

Product Definition | Report

Product name: Wind turbine

Open | Save

1. Material, manufacture and end of life

	Qty.	Component name	Material	of life
▶	1	Tower structure	Low carbon	cle
	1	Tower, cathodic protection	Zinc alloys	cle
	1	Nacelle, gears	Stainless ste	cle
	1	Nacelle, generator core	Low carbon	cle
	1	Nacelle, generator conductors	Copper alloy	cle
	1	Nacelle, transformer core	Cast iron, du	cle

2. Transport

	Stage name	Transport type
▶	Transit large compoents to site	32 tonne truck
	Transit small compoents to site	14 tonne truck
✳		

3. Use

Product life: 25 years

Country electricity mix: World

Static mode

☑ Product uses the following energy:

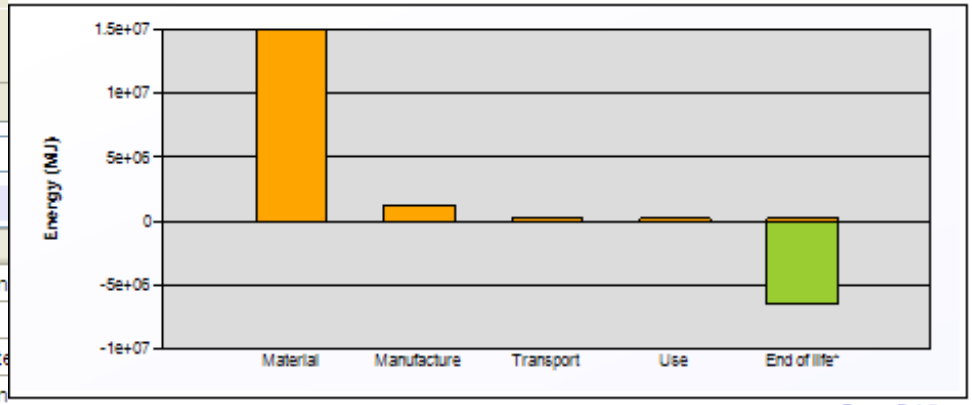
Energy input and output: Fossil fuel to mechanical, stean

Power rating: 200 hp

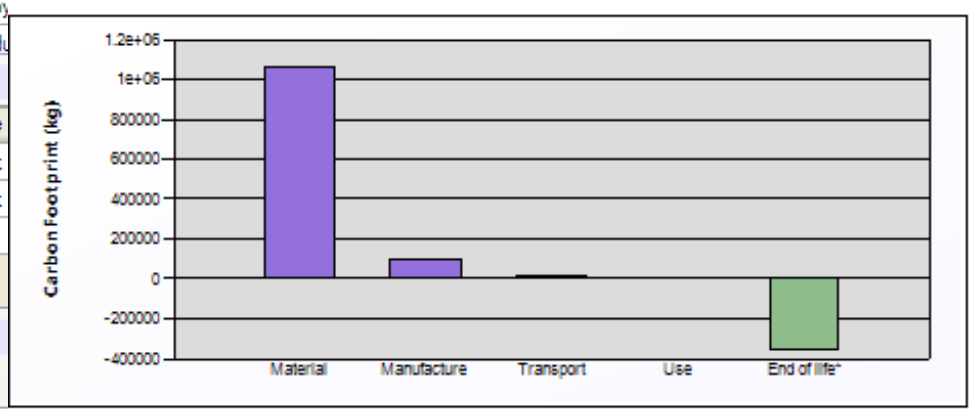
Usage: 3 days pe

Usage: 2 hours pe

Energy and Carbon Footprint Summary:



Energy Details...



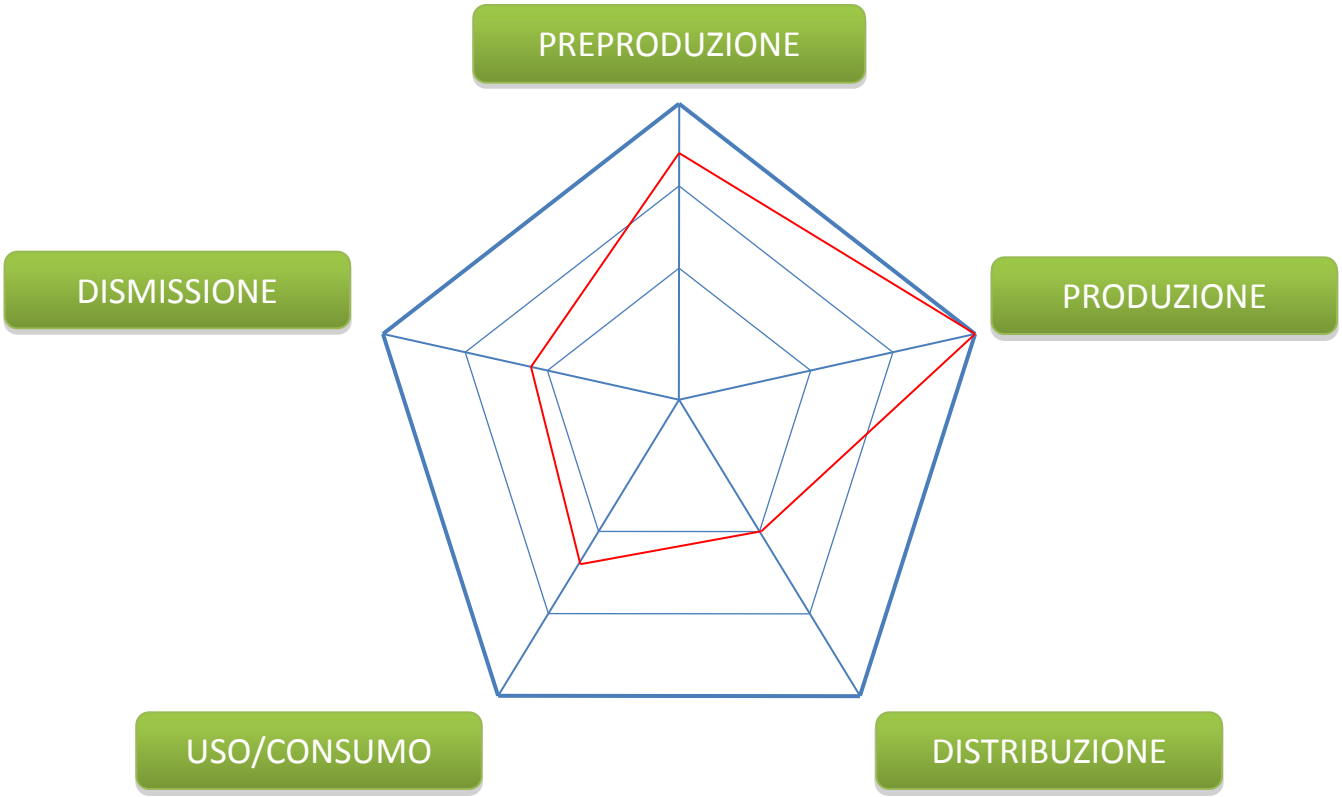
CO2 Details...

Phase	Energy (MJ)	Energy (%)	CO2 (kg)	CO2 (%)
Material	1.49e+07	88.9	1.06e+06	88.4
Manufacture	1.24e+06	7.4	9.82e+04	8.2
Transport	2.43e+05	1.4	1.73e+04	1.4
Use	2.01e+05	1.2	1.43e+04	1.2
End of life (collection & sorting)	1.75e+05	1.0	1.05e+04	0.9
Total	1.68e+07	100	1.2e+06	100
End of life (potential saving/burden*)	-6.39e+06	-38.1	-3.52e+05	-29.2
Total (including end of life saving/burden)	1.04e+07		8.53e+05	

*End of life saving/burden corresponds to the replacement of virgin material

VERIFICARE IL MIGLIORAMENTO

Capacità di miglioramento



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L'ECO-TOOL DI CONAI

Leve di PREVENZIONE

- Risparmio di materia prima
- Riutilizzo
- Utilizzo di materiale riciclato
- Ottimizzazione della logistica
- Facilitazione delle attività di riciclo
- Semplificazione
- ALTRO

DOSSIER 2010
LA PREVENZIONE ECOEFFICIENTE

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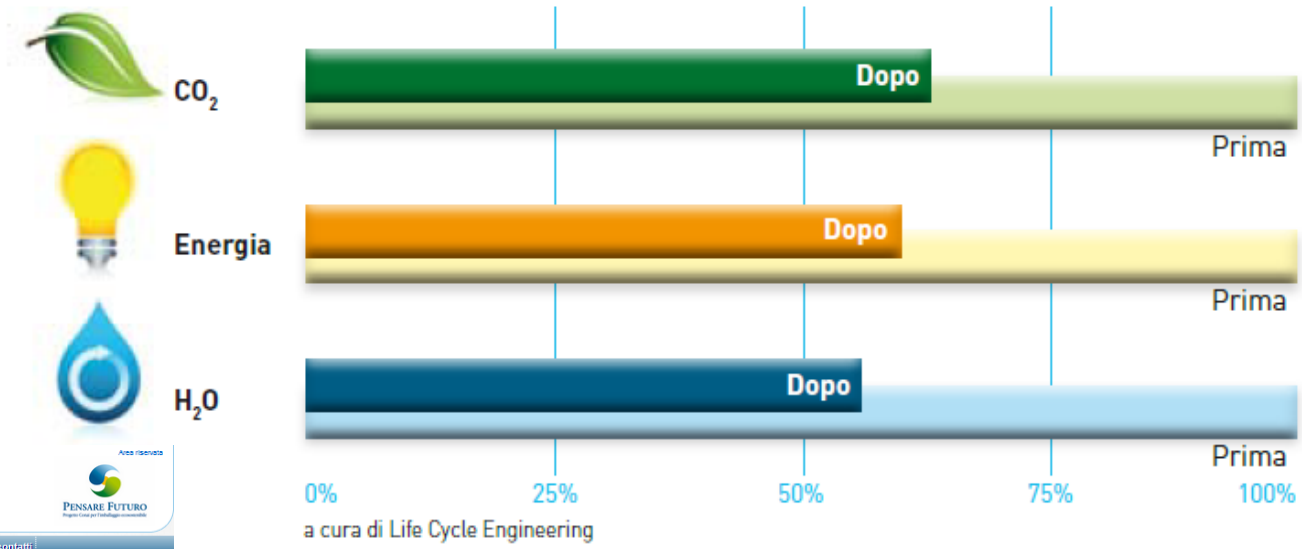
L'ECO-TOOL DI CONAI

www.studiolce.it



CONAI
Consorzio per il Recupero degli Imballaggi

ECO TOOL CONAI

Area riservata
PENSARE FUTURO

Home | Imballaggio ecoefficiente | Istruzioni Eco Tool | Presenta il tuo caso | Glossario | Info e contatti

Eco tool CONAI per l'analisi LCA semplificata

Descrizione progetto

L'EcoTool CONAI è un'iniziativa che ha l'obiettivo di mettere a disposizione delle aziende consorziate a CONAI uno strumento dedicato alla valutazione dell'ecoefficienza ambientale dei propri imballaggi.
L'EcoTool CONAI, realizzato con il supporto della società LCE, si basa sull'approccio "dalla culla alla culla" e consente di calcolare, attraverso un'analisi LCA semplificata (link a glossario), gli effetti delle azioni di prevenzione (link a pagina azioni e loghi) attuate dalle aziende sui propri imballaggi.
Il risultato di tali analisi viene espresso in:

- % di Riduzione delle emissioni di CO2
- % di Riduzione dei consumi energetici
- % di Riduzione dei consumi di acqua

Tutti i casi di imballaggio ecoefficienti saranno pubblicizzati e promossi da CONAI attraverso il "Dossier Prevenzione" e altri mezzi di comunicazione (sito, pubblicazioni, ecc).
L'EcoTool CONAI è un'iniziativa del Consorzio che rientra all'interno del progetto "Pensare Futuro" Per utilizzare l'EcoTool CONAI è necessario consultare le Istruzioni per l'Uso

Video tutorial

Tramite il video è possibile avere una rapida visione delle principali caratteristiche di Eco Tool Conai.
Suggeriamo agli utenti di raccogliere tutte le informazioni necessarie prima di accedere al form on line.

Istruzioni Eco Tool

L'EcoTool CONAI permette, attraverso la compilazione di un form on line, di valutare gli effetti delle azioni di prevenzione effettuate sugli imballaggi, mettendo a confronto la soluzione di imballaggio PRIMA e DOPO.
Prima di compilare il form è necessario disporre di tutte le informazioni di base per effettuare il confronto.
Una volta compilato ed inviato il form, verranno elaborati i dati presentati e successivamente verranno forniti all'azienda i risultati dell'Analisi LCA semplificata.

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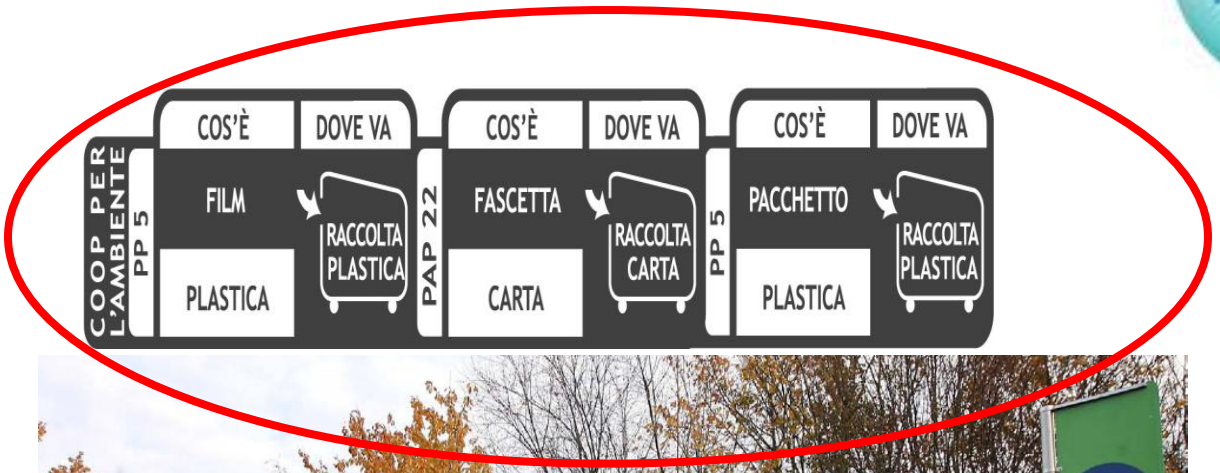
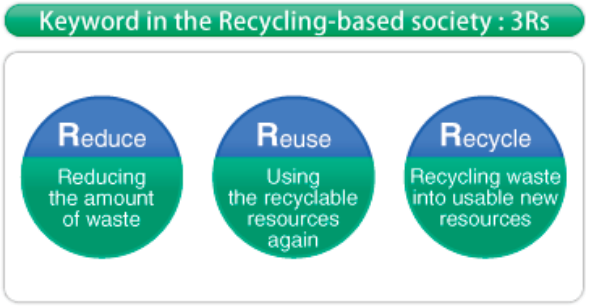
IL FINE VITA





1. **Reduce – refers to the reduction of natural resources used. By optimising pack design**

2. **Re-Use – EPS packaging can be re-used as multi-trip packaging, e.g. for the internal transport of partially assembled goods.**

3. **Recycle – is the reprocessing of used EPS packaging to make a new material such as hardwood replacement for making garden furniture, slate replacement for roofing tiles and new plastics items such as coat hangers, CD and video cases**

4. **Recover – EPS has a very high calorific value, higher than that of coal, and can be safely burnt within energy recovery units, or incinerators, without giving off toxic or environmentally damaging fumes**

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RECYCLING

Recycling is a mechanism. It is a mechanism for achieving some environmental goal. It is not a goal in its own right. Therefore, before any recycling scheme in introduced, it is essential that the ultimate goal be specified. If the goal is not specified, then it is impossible to judge whether the recycling scheme has achieved its purpose or to judge whether an alternative mechanism might not be better in achieving the goal.

IAN BOUSTEAD, LCA BOOK

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FTC and RECYCLED CONTENT CLAIMS

§ 260.13 Recycled Content Claims.

(b) It is deceptive to represent, directly or by implication, that an item contains recycled content unless it is composed of materials that have been recovered or otherwise diverted from the waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer). If the source of recycled content includes pre-consumer material, the advertiser should have substantiation that the pre-consumer material would otherwise have entered the waste stream. Recycled content claims may – but do not have to – distinguish between pre-consumer and post-consumer materials. Where a marketer distinguishes between pre-consumer and post-consumer materials, it should have substantiation for any express or implied claim about the percentage of pre-consumer or post-consumer content in an item.

ftc
eco in the market
green guides review

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FTC and RECYCLED CONTENT CLAIMS

Example 1: A manufacturer collects spilled raw material and scraps from the original manufacturing process. After a minimal amount of reprocessing, the manufacturer combines the spills and scraps with virgin material for use in production of the same product. A recycled content claim is deceptive since the spills and scraps are normally reused by industry within the original manufacturing process and would not normally have entered the waste stream.

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ISO 14021 and RECYCLED CONTENT CLAIMS

7.8 Recycled content

7.8.1 Usage of terms

7.8.1.1 Recycled content and its associated terms shall be interpreted as follows:

a) **Recycled content**

Proportion, by mass, of recycled material in a product or packaging. Only pre-consumer and post-consumer materials shall be considered as recycled content, consistent with the following usage of terms.

1) **Pre-consumer material**

Material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

2) **Post-consumer material**

Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

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ISO 14021 and RECYCLED CONTENT CLAIMS

b) **Recycled material**

Material that has been reprocessed from recovered [reclaimed] material by means of a manufacturing process and made into a final product or into a component for incorporation into a product.

c) **Recovered [reclaimed] material**

Material that would have otherwise been disposed of as waste or used for energy recovery, but has instead been collected and recovered [reclaimed] as a material input, in lieu of new primary material, for a recycling or a manufacturing process.

NOTE 1 A diagrammatic representation of a material recycling system is given in annex A.

NOTE 2 For the purposes of this International Standard, the expressions "recovered material" and "reclaimed material" are treated as synonyms; however, it is recognized that, in some countries, one or other of these expressions may be preferred for this application.

7.8.1.2 Material recycling is only one of a number of waste-prevention strategies. The choice of a particular strategy will depend on circumstances and account should be taken of differing regional impacts in making this choice. Consideration shall be given to the fact that a higher percentage of recycled content does not necessarily imply a lower environmental impact. Because of this, the recycled content claim, in particular, should be used with discretion.

7.8.2 Qualifications

7.8.2.1 Where a claim of recycled content is made, the percentage of recycled material shall be stated.

7.8.2.2 The percentage recycled content for products and packaging shall be separately stated and shall not be aggregated.

ISO 14021 and RECYCLED CONTENT CLAIMS

7.8.2 Qualifications

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7.8.2.2 The percentage recycled content for products and packaging shall be separately stated and shall not be aggregated.

7.8.3 Use of a symbol

7.8.3.1 When a claim of recycled content is made, the use of a symbol is optional.

7.8.3.2 If a symbol is used for a recycled content claim, it shall be the Mobius loop accompanied by a percentage value stated as "X %", where X is the recycled content expressed as a whole number calculated in accordance with 7.8.4. The percentage value shall be located either inside the Mobius loop or outside and immediately adjacent to the Mobius loop. Examples of acceptable locations of the percentage value are shown in Figure 2. The Mobius loop with a percentage value, stated as "X %", shall be taken to be a recycled content claim.

7.8.3.3 If the percentage recycled content is variable, it may be expressed with statements such as "at least X %", or "greater than X %".

7.8.3.4 The use of an explanatory statement is optional, subject to 5.6.

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ISO 14021 and RECYCLED CONTENT CLAIMS

7.8.3.5 Where a symbol is used it may be accompanied by material identification.

Figure 2 — Examples of acceptable locations of percentage value when using the Mobius loop to make claims about recycled content

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Valutazione di mercato e potenziale di sviluppo del fine vita dell'EPS

Struttura del mercato italiano e fine vita dei prodotti in EPS

EDILIZIA 55% → Fine vita lungo e riciclo con riserva (contaminazione massima 3-5%).

IMBALLAGGIO 41%

- Imballaggio primario → Raccolta domestica- tipo A → Mix/ET destinato al recupero energetico
- Imballaggio secondario → Rifiuti speciali e raccolta non domestica- tipo B → Piattaforme di raccolta imballaggi in plastica/PEPS
- Imballaggio terziario → Rifiuti speciali e raccolta non domestica- tipo B → Piattaforme di raccolta imballaggi in plastica/PEPS

ALTRI SETTORI 4% → Quantitativo trascurabile e fine vita come rifiuto indifferenziato

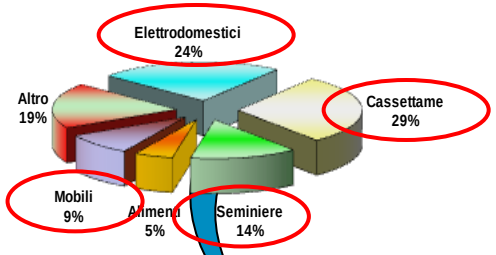
Possibili riutilizzi degli imballi in EPS post consumo

TIPOLOGIA \ RIUTILIZZO	RIGENERATO PER EDILIZIA (lastre, casseri, ...)	ALLEGERIMENTO CLS e TERRENI	PRODUZIONE IMBALLI	PS COMPATTO PER ESTRUSIONE (righelli, biro,..)	PS COMPATTO PER ESTRUSIONE con HIPS (grucce,..)
Cassettame (cassette del pesce, trasporti refrigerati, ..)	☹	😐	☹	☹	☹
Imballaggio beni (mobili, elettrodomestici, vetro,...)	☺	☺	☺	😐	😐
Seminiere	😐	☺	☹	☹	☹
Alimentari	☹	😐	☹	☹	☹

NORD: 55 % delle vendite di elettrodomestici e dove risiede il 40 per cento della popolazione nazionale

CENTRO-SUD: grande produzione agricola e elevati quantitativi di seminere utilizzate ogni anno.

Principali impieghi degli imballaggi in EPS



TIPOLOGIA \ DESTINAZIONE	DOMESTICA	NON DOMESTICA	RACCOLTA PEPS
Cassettame	✓	✓✓	☹
Imballaggio beni (mobili, elettrodomestici, vetro,...)	✓✓	✓	☺
Seminiere		✓✓	😐
Alimentari	✓✓		☹

Accordo Quadro AIPE-COREPLA per riciclaggio imballi in EPS post- consumo: piattaforme PEPS

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IL FINE VITA

esempio cassette per il pesce

SEAFISH — technology implementation Key Features
Alternative disposal of polystyrene fish boxes

SEAFISH — technology implementation Key Features
Alternative disposal of polystyrene fish boxes

Case: Norlax - compacting EPS fish boxes - RUNI Screw Compactor - RUNI A/S - Windows Internet Explorer

TURN WASTE TO VALUE — RUNI DANISH ENGINEERING

HOME | COMPACTING | SEPARATION/DRAINAGE | CASES | MACHINES | SEARCH

- Case list
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Environment friendly EPS handling turns waste to value

Norlax earned a return on its investment in a RUNI SK370 and its housing within 2 years.

On a good day, up to 1,000 boxes of salmon are fed into production at NORLAX A/S, Denmark. The huge quantity of EPS boxes used to fill 4 truckloads per day, which commuted constantly between the company's premises and a waste handling company 30 km away. Nowadays, the boxes are compacted into blocks in a RUNI SK370. The blocks are picked up every two weeks, when there is a total of 10 pallets, representing a total of around 5.5 tons.

"It is highly durable and easy to operate. We have to adjust it a little from time to time, because there is a difference between the various EPS types in the boxes we receive. Nine blocks on a pallet weigh typically 550 kilo, but we have also been right up to 800 kilo," says Factory Manager Carsten Krarup.

The compactor is located in an outbuilding added on to the production building to avoid EPS pieces blowing around. In the main building, the empty boxes are pushed on a slide and directly into the machine once they are empty. They are turned upside down to empty ice and water out before being compacted.

"It's more environment friendly to sell EPS for recycling instead of disposing of it as waste, and it becomes a source of income instead of a cost. EPS boxes used to be very expensive to dispose of," concludes Krarup.

The compacted EPS blocks bring in about DKK 1,600 per ton, and apart from the waste charge, 4 daily truck runs are saved, including labour and

Introduction

Expanded polystyrene (EPS) fishboxes are widely used throughout the seafood industry for transporting all types of chilled products due to their thermal, shockproof and waterproof properties. However, for many seafood processors or wholesale markets, the disposal of used polystyrene fishboxes can be an expensive and difficult problem. But there are alternatives to simply throwing whole EPS boxes in the bin. Used EPS fishboxes are being successfully and profitably recycled throughout the UK.

his document describes various options for the disposal or recycling of used EPS and provides list of contacts and agencies who can give further assistance.

	Brunel University	Middlesex	Seeks collaborators in the seafood sector	Researching Bio-degradable packaging	Prof. Jim Song	01895 266 692 Jim.song@brunel.ac.uk	www.brunel.ac.uk
Advisory organisations	Expanded Polystyrene Packaging Group	London	Good website full of usef	Information on	Damian		www.eps.co.uk
	British Plastics Federation	London	Trad of th indus				
	ENDAT Process Engineering Compendium	Stirling	Exte of pr servi				
Regulators	DEFRA, SEERAD, DARDNI & National Assembly for Wales	England, Scotland, Northern Ireland and Wales	Usef				

SEAFISH
Technology Implementation Department
Sea Fish Industry Authority, Seafish House, St A

der the Producer Responsibility Obligations (Packaging
ies or groups of companies that have a total annual
packaging per year. For further information on this,
cy in England and Wales, SEPA in Scotland and DARD in

IL FINE VITA

esempio cassette per il pesce

EPS PERFORMANCE PACKAGING N · E · W · S November 2002

"Recycle your used fish boxes" says EPS Packaging Group

Until recently used EPS fish boxes used to be a waste headache for fish producers in the UK, because unlike clean EPS packaging, used fish boxes could not be recycled. The fish and ice in the boxes 'contaminated' the EPS making it almost impossible to recycle them.

"The good news for the fish industry is that their used fish boxes can now be recycled; this demonstrates the continuing technical innovation the industry is putting into developing recycling" says Andrew Barnetson, Environmental Affairs Manager, EPS Packaging Group.

"There are two UK recyclers that will take EPS packaging that has been 'contaminated' with fresh fish and reprocess the material into a clean polystyrene bead that can be sold to industry"

"After some work we have developed a process that delivers a clean reprocessed polystyrene bead. That means that if we can get a large supply of fish box material that has been hosed down and then compacted we will pay for it."

One of the companies supplying WES Recycling with fish boxes is Sealord Caistor Ltd, part of Sealord Group which is one of the largest fish processors in the world. 'We have fresh fish air-freighted to us daily from Iceland and other countries in EPS boxes'

leading supplier of fish to a large retail group - has a contract with a fish box recycler: "All the boxes that come to us are recycled. Our recycler has installed a compacter free of charge and comes regularly to collect the compacted waste, which is eventually made into picture frames and other mouldings.

"That solves the problem our end, but we are still sending out around 30,000 boxes a week ourselves. They all end up at individual stores and are not being recycled."

Andrew Barnetson acknowledges that collecting from companies like Seachill is just the first step: "We would like to see the supermarkets tackling this issue too. We know that a manager at one of the largest is currently looking into recycling EPS and we hope

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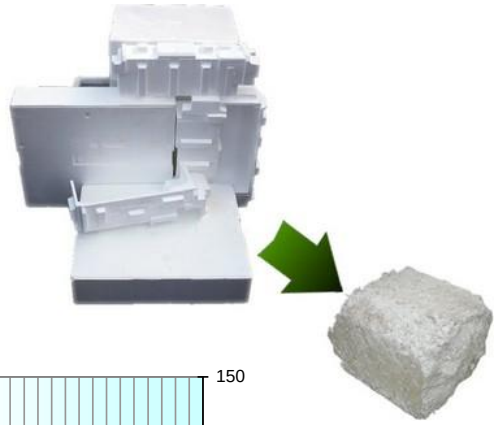
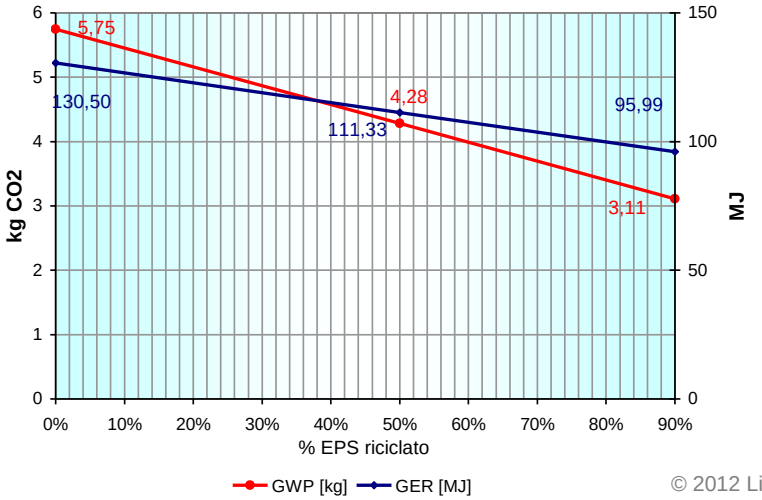
FISH BOX IN EPS

Zero impact





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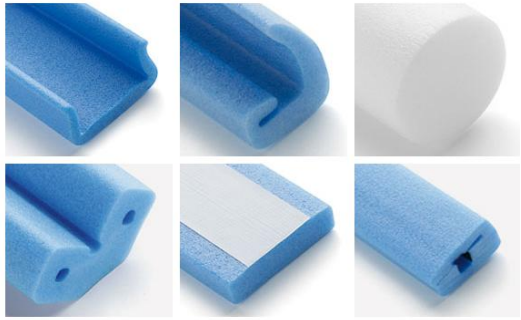

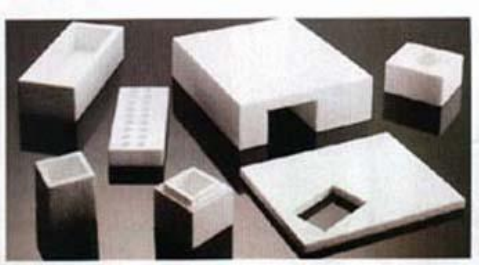

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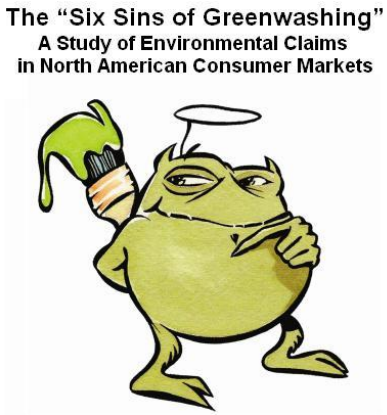

ISO 14021

ISO Type II environmental labelling : Self-declared environmental claims

Example: Recyclabilty

ISO 14025

ISO Type III environmental labelling: Quantified environmental life cycle product information (not selective)

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