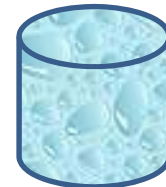
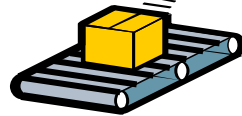




ECO-PACK: ECONOMY & ENVIRONMENTAL IMPACTS



DEFINITIONS

ECONOMY: MANAGE FLOWS (IN/OUT) TO SUSTAIN THE HOUSE (OEKOS).

ECOLOGY: SCIENCE TO ORGANIZE THE HOUSE AND AROUND (ENVIRON).

SOCIETY: SOCIUS=CUM PANIS: SHARE THE BREAD (RESSOURCES).

MONEY: JUNO MONETA: ADVICE TO VALUE EXCHANGES (CONVENTION)

ECONOMY & ENVIRONMENTAL IMPACTS OF PACKS: SLIDES PLAN

- ✓ SUSTAINABLE VALUES FOR TODAY & TOMORROW: THE « S2E » VALUES
 - ECOLOGY: 1 EARTH - SOCIETY: 1 HUMAN KIND – ECONOMY: 1 OEKOS FOR RE-SOURCES.
 - DO WE HAVE TIME (**T.E.M.P.S.** in French) TO REPAIR NEGATIVE ENV. IMPACTS (**COSTS**) ? – TIME IS MONEY **€** !.
 - **T.E.M.P.S.:** REDUCES **TOXIC**, EFFICIENT **ENERGY**, **MATERIAL** & **PROCESS**, INCREASED **SUSTAINABLE VALUES**
- ✓ VALUES OF RESSOURCES USE: THE U.N. APPROACH « 6RE »
 - RETHINK FUNCTIONS;REDUCE ENERGY & MATERIAL;REPLACE;RECYCLE ;REUSE ;REPAIR.
 - VALUES INDICATORS FOR ENVIRONMENTAL IMPACTS OF « RE » STRATEGIES (GRI)
- ✓ EXAMPLES OF OPTIMIZED PACKS WITH THE **TRADITIONNAL** APPROACH OF « REDUCES » 94/62/EC
- ✓ RESSOURCES OPTIMIZING FOR PACK: THE **NEW** IPPC APPROACH OF DIRECTIVE 2004/12/EC
 - THE MULTI-FUNCTIONAL APPROACH ON THE ALL LIFE CYCLE TO **AVOID TRANSFER OF IMPACTS & GREEN WASHING.**
- ✓ THE PACK: A MULTI-FUNCTIONAL SYSTEM FOR PACKED GOODS TO ADD VALUES
 - CASE STUDY FOR 1 FUNCTION « RECLOSABLE » WITH DIFFERENT MATERIALS PP, **PP-TEMPS**, PVC,PLA
 - CONCLUSION (PART): CHANGING MATERIALS DO NOT REDUCE IMPACTS, BUT OPTIMIZING **TEMPS**: YES.
 - EXAMPLE OF LIFE CYCLE ASSESSMENT & LIFE CYCLE COSTING WITH OPTIMIZED **TEMPS** STRATEGY
- ✓ EX. OF ECO-DESIGNED PACKS WITH THE NEW APPROACH: ECONOMICAL & ENVIRONMENTAL IMPACTS
- ✓ ECO-PACKS: CHALLENGE FOR THE TODAY NON-PAID « EXTERNALITIES »:DUMPINGS ON **I** & **S** OF **TEMPS**
- ✓ CONCLUSION: COSTS & IMPACTS: CHALLENGE FOR ECO-LABELS TO RE-EQUILIBRATE VALUES BALANCE .
PACKS & PACKERS WITH « S2E » VALUES SHOULD BE SUSTAINED BY ALL ACTORS OF THE VALUES CHAIN.

SUSTAINABLE VALUES FOR TODAY & TOMORROW: 1 EARTH

Ce qui est rare m'est cher (what is rare will be valuable and become expensive)



**IMPACT ON
EARTH:
COSTS TO REPAIR
?**

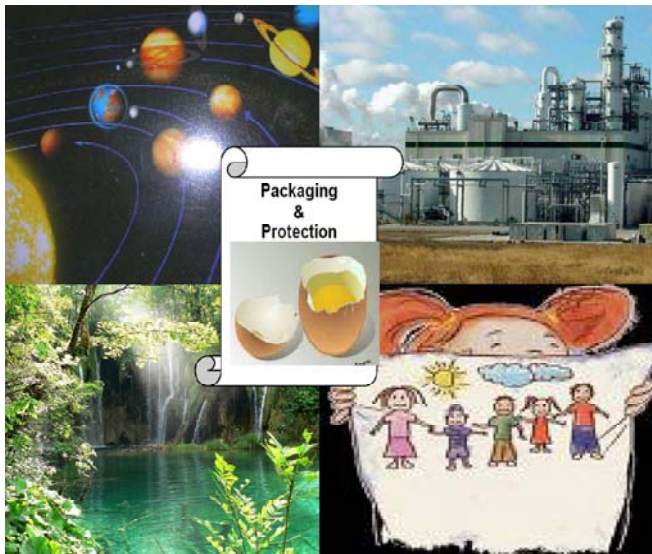


ECOLOGY: SUSTAIN & REPAIR ECOSYSTEM	
GOOD GOVERNANCE: EASY TO REPAIR	OK
BAD GOVERNANCE: DIFFICULT RENEW OF RESOURCES	DESTROYED

ECONOMY	CONSEQUENCES ?
SOCIETY	CONSEQUENCES ?
ECOLOGY	ADD /LOSS VALUES

SUSTAINABLE VALUES FOR TODAY & TOMORROW: 1 HUMAN KIND

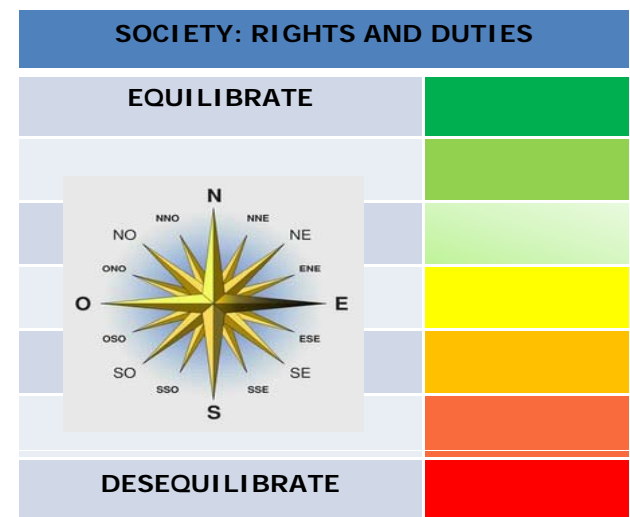
La terre ne nous appartient pas: Nous l'empruntons à nos enfants (Antoine de St Exupery)



Packaging & Protection



IMPACTS FOR THE FUTURE ?

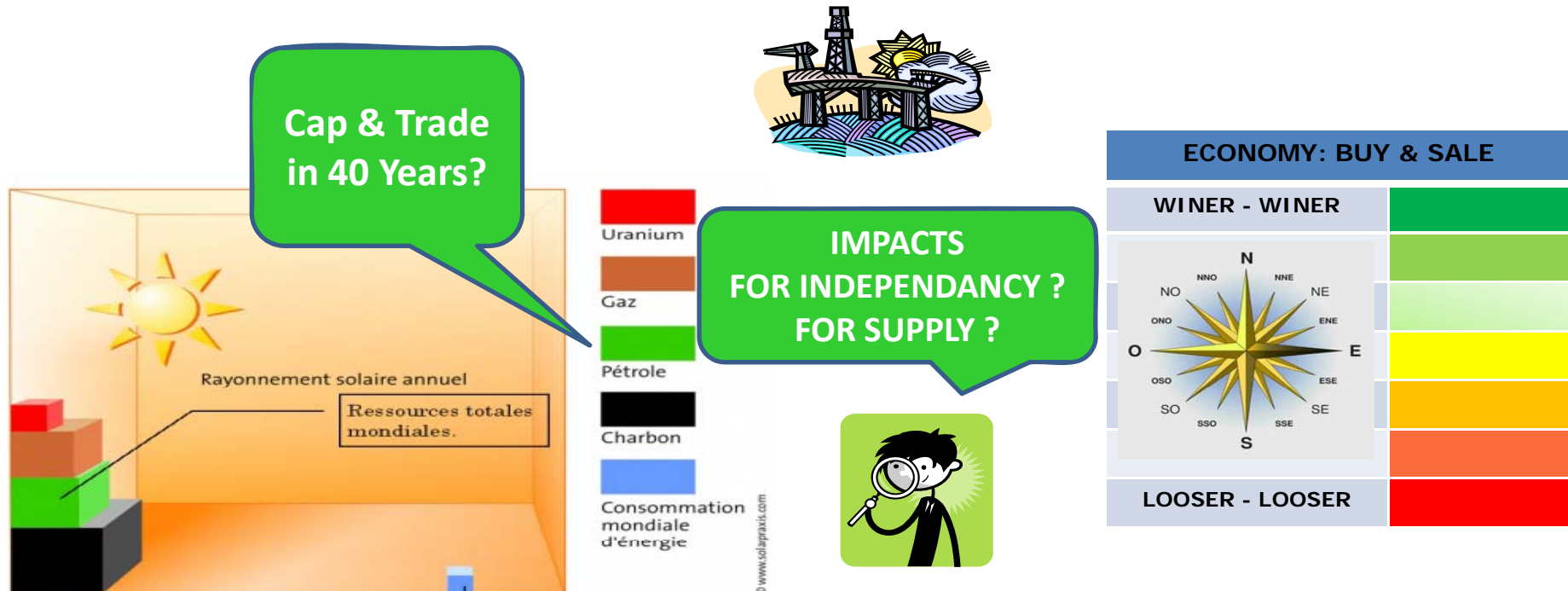


ECONOMY OF EXCHANGES
 SOCIETY & HUMAN KIND SURVIVAL
 ECOLOGY

ETHICAL VALUES (JUNO MONETA) ?
 VALUES MAKE SENSE
 SUSTAINABLE VALUES

SUSTAINABLE VALUES FOR TODAY & TOMORROW: 1 ECO-SYSTEM FOR RE-SOURCES

Rarities and monopoles will be expensive and wars to take them next door as well ☹



Metal (Source BGR-Germany - Geology)

- ❖ Platin \$/to = 1000 (2006) > 1305 (2007)
Ressources: 100-250 years
- ❖ Kupfer \$/mt = 6386 (2006) > 7970 (2007)
Ressources: 50 – 150 years
- ❖ Uranium: **Ressources: 50 – 350 years**

LANTHANIDES
RESSOURCES
For GREEN-IT
ASIE MONOPOLE

VALUES/COSTS OF RESSOURCES: DO WE HAVE THE « TEMPS »?

« JUNO MONETA »: MONEY – ADVICE TO VALUE EXCHANGES

T.E.M.P.S. « TIME IN FRENCH »	PAST	PRESENT	FUTURE
ECO-LOAD OF TOXICS	IRREPARABLE SEVESO, ARAL ...	REDUCES	REPAIR, RENEW
ENERGY EFFICIENCY	TOO LOW	BETTER	BEST AVAILABLE TECHNICS
MATERIALS INTENSITY	IN DEPLETION	OPTIMIZED	BEST AVAILABLE TECHNICS
PROCESSES EFFICIENCY	TOO MUCH POLLUTION	ACTIONS IN PROGRESS	GREEN TECH
SOCIETAL VALUES	WARS: INACCEPTABLE	IN PROGRESS	RIGHTS & DUTIES

WHICH STRATEGY TO WIN TEMPS ?

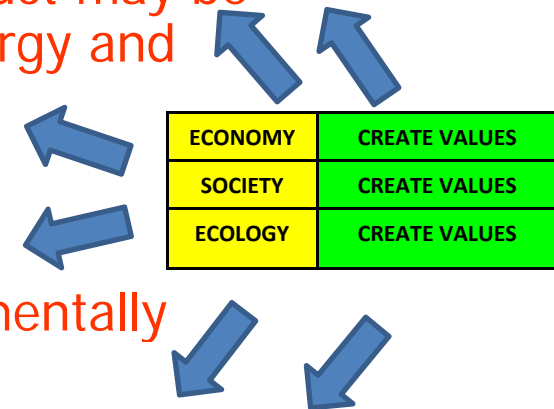




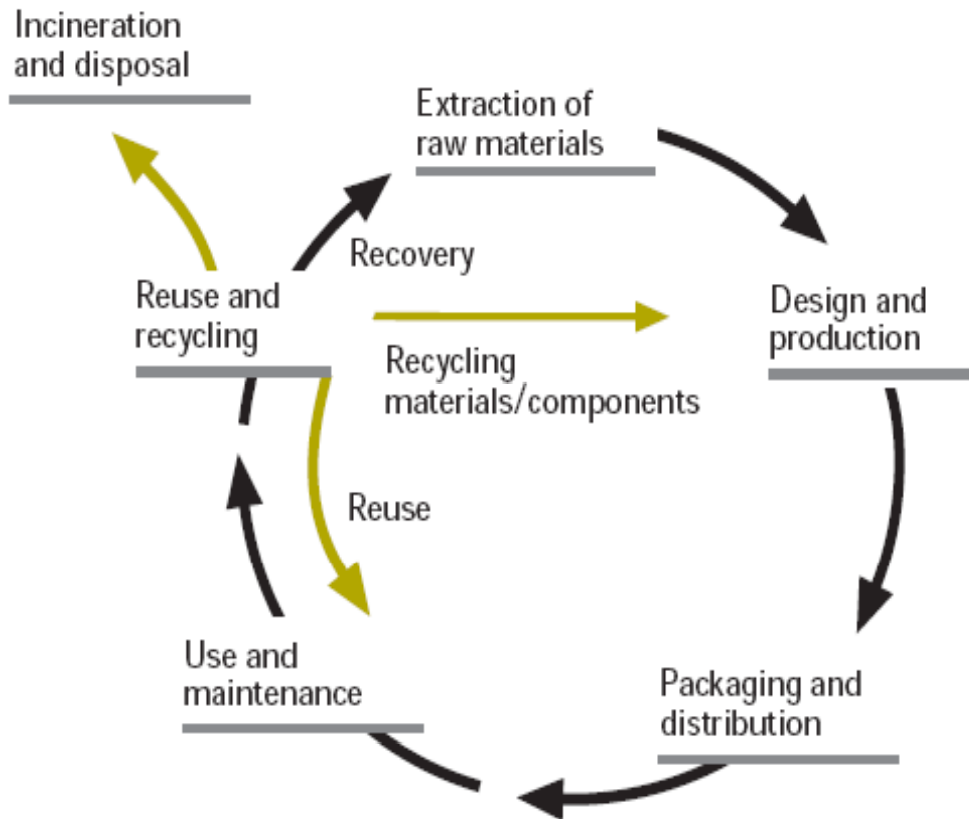
Strategy to win TEMPS: The 6 "RE" OF United Nations Life Cycle Thinking and Pollution Prevention

Life cycle thinking expands pollution prevention to include the complete product life cycle and sustainability. Source reduction in a product life cycle perspective is then equivalent to eco-design principles and what had been called the "6 RE philosophy":

- **Re-think** the product and its functions. The product may be used more efficiently, thereby reducing use of energy and other natural resources.
- **Re-duce** energy and material consumption throughout a product's life cycle.
- **Re-place** harmful substances with more environmentally friendly alternatives.
- **Re-cycle**. Select materials that can be recycled, and build the product such that it is disassembled easier for recycling.
- **Re-use**. Design the product so parts can be reused.
- **Re-pair**. Make the product easy to repair so that the product does not yet need to be replaced.



CREATE VALUES: LIFE CYCLE = VALUES CHAIN
“RE”-duce Toxics Energies Materials Processes
“RE”-think Sustainability = SAVINGS T.E.M.P.S. FOR THE FUTURE



RETHINK RESSOURCES	ADD VALUES € and ECO / Kg
RE-DESIGN EFFICIENCY	ADD VALUES € & ECO / Functions
PACK EFFICIENCY	ADD VALUES €/Pack
TRANSPORT EFFICIENCY	ADD VALUES CO2/Packed Units
DISTRIBUTE EFFICIENCY	ADD VALUES ECO « Appeal »
USE EFFICIENCY	ADD VALUES € / FUNCTIONS
RE-USE RE-CYCLE	ADD VALUES €, ECO, SOCIAL / FU
RE-COVER	ADD VALUES LESS TAXES

“RE” STRATEGY: SAVINGS “T.E.M.P.S.” – CREATE VALUES ALONG THE VALUES CHAIN

T.E.M.P.S	IMPACTS NEW ECO-DESIGN	REACH: 150'000 € COSTS SAVINGS TO REPLACE ROHS
TOXICITIES ECO-LOAD	SAVINGS REACH, VOC Reduced 100%	MJ and kWh / Kg : SAVINGS ON ELECTRICTY
ENERGIES EFFICIENCY	SAVINGS COSTS : 25 %	EEX: 30 €/MWh
MATERIALS INTENSITY	SAVINGS EMERGY: 50% WEIGHT: 20% CO2 Eq.: 45 %	20%/ Kg SAVED ON MATERIAL COST EXAMPLE: PET = 1.7 €/Kg
PROCESS EFFICIENCY	SAVINGS MJ, CO2	Ex.: 150 T. of CO2 SAVINGS (CO2 17€/t) 28% „Fossil“ Öl Barrels LESS 1 Barrel (158.98 L.) OVER 80\$
SUSTAINABLE VALUES	SAVINGS –ROQ & ROI RETHINK, REDUCE, REPLACE, RECYCLE, REPAIR, REUSE	Business Keys Success Add Values

ENVIRONMENTAL IMPACTS: T.E.M.P.S INDICATORS

Choice of Indicators for YOUR sustainable values

EXAMPLES ON GRI (GLOBAL REPORTING) ENVIRONMENTAL INDICATORS	
YOUR VALUES FOR SAVING RESSOURCES	EN2 % OF RECYCLED CONTENTS
YOUR VALUES FOR AVOIDING WASTES	EN5 ENERGY EFFICIENCY
YOUR VALUES FOR AVOIDING POLLUTIONS	EN18 REDUCTION OF GREEN HOUSE GAZ
YOUR VALUES FOR PRESERVING WATER	EN21 WATER POLLUTIONS
YOUR VALUES FOR SUSTAIN ECO-SYSTEMS	EN30 INVESTMENT TO PROTECT ECO-SYSTEMS

INDICATOR USED FOR ECO-PACKS

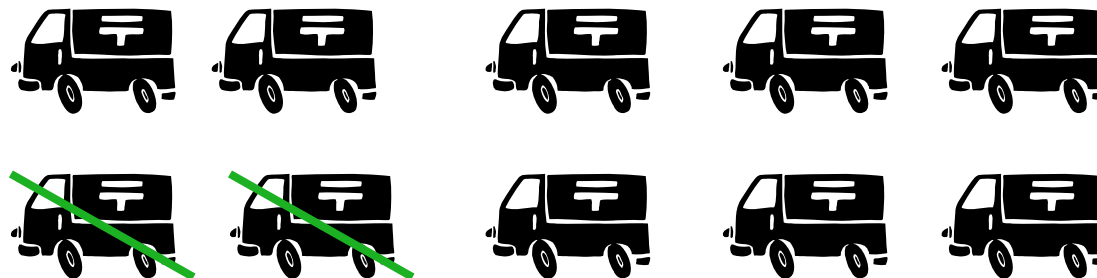
- ECO-DESIGN INDICATORS LINKS WITH ENVIRONMENTAL INDICATORS TO IDENTIFY ADDED VALUES FOR VALUE CHAIN ACTORS

– EXAMPLES:

- INDICATOR RATIO VOLUME or WEIGHT OF PACK / PACKED PRODUCTS LINKED WITH TRANSPORT INDICATORS (HERE LORRIES – MAY BE CO2 AS WELL ...)

– - 20 % BETTER RATIO PACK INTENSITY/PACKED PRODUCT:

= LINKED WITH LORRIES INDICATOR: 2 LORRIES LESS ON THE ROAD



- INDICATOR (GRI-EN2) % OF RECYCLED CONTENT

- 50% RECYCLED CONTENT OF PAPER IS 50% LESS RESSOURCES DEPLETION

TIME (T.E.M.P.S.) IS MONEY: CREATE VALUES WITH ECO-PACK







T.E.M.P.S.	COMPARE ENVIRONMENTAL IMPACTS OF ECO-PACK & USUAL PACK		PACK
TOXICS ECO-LOAD	100 % ENVIRONMENTAL IMPACT		USUAL
	REDUCTIONS 50%	VOC, REACH: €/PACK	ECO
ENERGY EFFICIENCY	100 % ENVIRONMENTAL IMPACT		USUAL
	IMPROVED EFFICIENCY 75%	ELECTRICITY KWH: €/PACK	ECO
MATERIAL INTENSITY	100 % ENVIRONMENTAL IMPACT		USUAL
	50 % LESS WEIGHT	COSTS €/KG	ECO
SUSTAINABLE VALUES	100 % ENVIRONMENTAL IMPACT		USUAL
	50 % RECYCLED	GREEN DOTS €/FU	ECO

REGULATION FAIR PRICE: €/FU ?
 REGULATE: ECO-TAXES €/PACK ?
 GREEN DOTS €/PACK: FAIR ?
 FREE OF TAXES €/ FOR ECO-PACK ?
 EFFECTIVE COSTS PAID IN VALUES CHAIN ?





PRINCIPLES OF ECO-PACK BALANCE

OLD APPROACH: 94/62/EC – « WEIGHT REDUCES »



ECO-PACK Scores Balance (BEFORE / AFTER)					
PACKAGING (Sales Unit)	Primary	Secondary	Tertiary	Global	TAXES COSTS
COSTS (100= A+B+C)	- Y	- Y	- Y	- Y	Green Dots
MATERIALS, PROCESS %	- Y %	- Y %	- Y %	- Y %	V.O.C
ENERGY/YEAR	- Y	- Y	- Y	- Y	GHG-CO2
FUNCTIONS FULLFITMENT	%	%	%	%	V=Q/C
WEIGHT	AFTER - BEFORE	AFTER - BEFORE	AFTER - BEFORE	%	PALLETS
RATIO PACK/PRODUCT	AFTER - BEFORE	AFTER - BEFORE	AFTER - BEFORE	%	LORRIES
ADDED COSTS : $T=C+(QxU)+(QxL)/S$			RE STRATEGY BAROMETER		
ADDED VALUES: FUNCTIONS-NEEDS COSTS / COST UNIT: +/-=					
			RENEW	REDUCE	REMOVE
DEFECTS UNITS	ECONOMY Saving	ENERGY Saving			
BEFORE/AFTER	BEFORE/AFTER	BEFORE/AFTER	BEFORE AFTER	BEFORE AFTER	BEFORE AFTER
PALLETS SALES UNITS	TRANSPORTED SU	LORRIES SAVED	REUSE	RECYCLE	RECOVERY
					

**FUNCTION FOR USER: SAME WASHING EFFECT WITH OPTIMIZED TEMPS
 LESS TOXICS, ENERGY, MATERIAL, PROCESS
 MORE SUSTAINABLE VALUES
 (REDUCES USE OF RESSOURCES: WATER, PRODUCT)**

IMPACTS INDICATORS	USUAL	ECO-PACK
ECONOMICAL IMPACT INVEST 9 MONTHS		
ENVIRONEMENTAL IMPACT SAVE 15 LORRIES/YEAR		
MATERIAL TYPE MATERIAL INTENSITY	PP 49 g	PP LESS TEMPS 27 g
PRODUCT EFFICIENCY FOR 100% FUNCTIONAL UNIT	750 ml % FU	CONCENTRATE: 500 ml % FU
VOLUME – RATIO PACK/PRODUCT	49/750 6.5	27/500 5.4

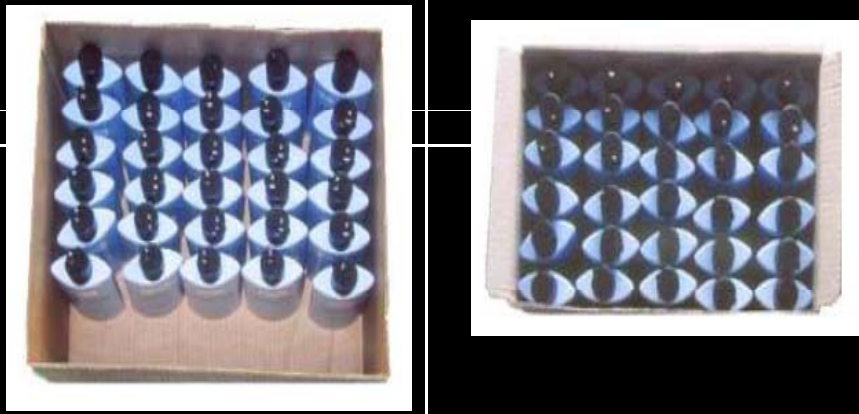
FUNCTION FOR PACKER: SAVE MATERIALS

FUNCTION FOR USER: REUSE BAG

IMPACTS INDICATORS	USUAL	ECO-PACK
ECONOMICAL IMPACT LESS GREEN DOT TAXES		
ENVIRONMENTAL IMPACT SAVE 7 TONES OF PETROL /YEAR		
MATERIAL TYPE	BOX PVC	BAG REUSABLE (S-VALUE)
MATERIAL INTENSITY	70 g	15 g
PRODUCT EFFICIENCY	1 KG	1 KG
FOR 100% FUNCTIONAL UNIT	% FU	% FU
VOLUME – RATIO PACK/PRODUCT	70/1000 0.07	15/1000 0.015

FUNCTION FOR PACKER: SAVE MATERIALS

FUNCTION FOR TRANSPORTER: SAVE ENERGIES

IMPACTS INDICATORS	USUAL	ECO-PACK
ECONOMICAL IMPACT INVEST 1 WEEK (€)		
ENVIRONMENTAL IMPACTS SAVE 26 TONES OF PAPER /YEAR SAVE 19 LORRIES / YEAR		
MATERIAL TYPE	BOX PAPER	BOX PAPER LESS TEMPS
MATERIAL INTENSITY	600 g	180 g
PRODUCT EFFICIENCY	30 BOTTLES	30 BOTTLES
FOR 100% FUNCTIONAL UNIT	60 % FILLED	100 % FILLED
VOLUME – RATIO PACK/PRODUCT	600/30 20	180/30 6

Integration of PREVENTION of POLLUTION in Concept (IPPC)
Main Sources Green Dot :www.pro-e.org – CNE www.conseil-emballage.org



before

after

Frozen fish

Improvement - Reduction of weight. Logistic optimisation.

Description of changes - The original carton box contained four fish portions individually packed in PP film. The packaging was replaced by a lighter PE-coated carton box and the PP film was removed, without reducing the product quantity (400 g). The secondary packaging was also modified. The weight of the cardboard box was reduced, but it contains more product (20 instead of 12 primary packaging units). Due to these changes, one pallet can now carry 768 kg instead of 470 kg of product. In the production process, the use of plastic bags for interim storage was eliminated. The empty primary packaging is delivered in re-usable boxes.

Environmental benefits

- Elimination of a packaging element
- Weight reduction
- Transport optimisation + 63 %
- Re-use

Source: All Fresh, Belgium

Balance of improvement

<i>Packaging</i>	<i>Weight reduction</i>	
Primary packaging		
PP film	- 4.40 g	- 100.00 %
Carton box	- 2.60 g	- 11.35 %
Secondary packaging		
Cardboard box	- 35.00 g	
(per sales unit)	- 9.40 g	- 49.73 %

Integration of PREVENTION of POLLUTION in Concept (IPPC)

Main Sources Green Dot : www.pro-e.org – CNE www.conseil-emballage.org



before

after

Cheese

Improvement - Optimisation of packaging dimensions.

Description of changes - Originally the round carton consisted of a stamped body, a flange, a partition and a bottom part in corrugated fibreboard. By removing the false bottom and lightening the partition both the height and weight of the carton were reduced (from 26.4 to 21.6 g for the 12-portion carton). This also lightened the slotted box.

Environmental benefits

- Reduction of packaging material per annum: 1,118.5 tonnes

Source: Conseil National de l'Emballage (CNE); Fromageries Bel, France

Balance of improvement

Packaging	Weight reduction	
Primary packaging	- 4.80 g	- 15.30 %
Secondary packaging	- 0.271 g	- 4.10 %
Total	- 5.07 g	- 13.30 %

Soft drinks

Improvement - Reduction of packaging weight.

Description of changes - Thanks to technical optimisation, it was possible to reduce the quantity of material used to produce the body of the can. As a result, the 0.33 cl can is now about 7.5 grammes lighter than before.

Environmental benefits

- Reduction of 75,750 tonnes of tinplate per annum.

Source: Prevenção de resíduos de embalagens (EMBOPAR/Sociedade Ponto Verde)

Balance of improvement

Packaging	Weight reduction	
Primary packaging (can)	- 7.50 g	- 23.00 %

Integration of PREVENTION of POLLUTION in Concept (IPPC)

Main Sources Green Dot : www.pro-e.org – CNE www.conseil-emballage.org



Coffee

Improvement · Reduction of the weight of the differently sized Nescafé glass jars (200 g, 100 g and 50 g).

Description of changes · In 1999, the thickness of the glass jar was reduced due to an improvement in material technology. This modification significantly reduced the consumption of packaging materials.

Environmental benefits

- Packaging material saved per annum: 4,250 tonnes

Source: Nestlé, S.A., Spain

Margarine

Improvement · Reduction of weight.

Description of changes · The weight of the 500 g thermoformed PP (polypropylene) tub was reduced from 21.3 g to 18.8 g. The thickness of the film used to make the tubs was reduced. This reduction was possible thanks to an investment in new moulds. Similar weight reductions were achieved for other types of tubs.

Environmental benefits

- Packaging material saved per annum: 137 tonnes

Source: Vandemoortele, Belgium

Balance of improvement

Packaging	Before*	After*	Weight reduction
Glass bottle	2,485,71 g	2,285,71 g	- 8,05 %
Plastic lid	122,86 g	122,86 g	0,00 %
Total	2,608,57 g	2,408,57 g	- 7,67 %

* per kg product contained

Balance of improvement

Packaging	Weight reduction	
Primary packaging	- 2,50 g	- 12,00 %

ACCESS
DOC



Parcel Mailer Packaging

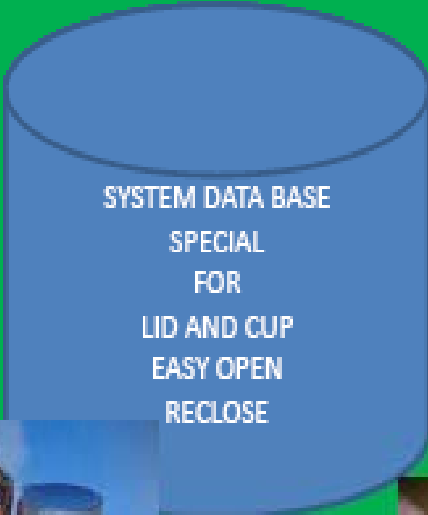
Two forms of express postal mailers are commonly used: 100% recycled paperboard with 35% post-consumer recycled material; and HDPE flexible pouches.

- Recycled paperboard mailers produce 7.5 times more landfill waste by weight per 100 g of product than HDPE flexible pouch mailers (taking into consideration a 12% recovery rate of paperboard).
- The flexible pouch mailer uses 1/8 the amount of packaging per 100 g of product vs. the paperboard mailer.
- Use of the recycled paperboard mailer increases shipping weight by 0.19 lbs, resulting in increased mailing costs of \$3.38 for FedEx Standard Overnight® vs. using an HDPE flexible pouch mailer.







Package Format	Product Weight	Weight of Packaging	Product to Package Ratio	Package per 100 g Product
Recycled Paperboard Mailer	13.28 ounces (376 g)	96.38 g	4:1	25.63 g
HDPE Flexible Pouch Mailer	13.28 ounces (376 g)	11.33 g	33:1	3.01 g

FedEx® mailing assumptions: 1.0 lb product without packaging mailer (mailer weight added for cost estimate), residential address ship from ZIP code 21202 (Baltimore) to 60602 (Chicago), declared value \$10.00, FedEx Pak package type, FedEx.com rate finder 9-10-07.
 FedEx and FedEx Standard Overnight are registered trademarks of FedEx Corporation.
 Product weight assumption: 100 sheets of 24 lb 8.5" x 11" copy paper
 Landfill waste data source: The U.S. Report, February 2007

RESSOURCES OPTIMIZING FOR PACK: NEW IPPC APPROACH THE DIRECTIVE 2004/12/EC: MULTI-FUNCTIONAL APPROACH



SYSTEM DATA BASE
SPECIAL
FOR
LID AND CUP
EASY OPEN
RECLOSE

NOUVELLE APPROCHE: DIRECTIVE 2004/12/EC

HAVE ADOPTED THIS DIRECTIVE:

Article 1

Directive 94/62/EC is hereby amended as follows:

1. the following subparagraphs shall be added to point 1 of Article 3:

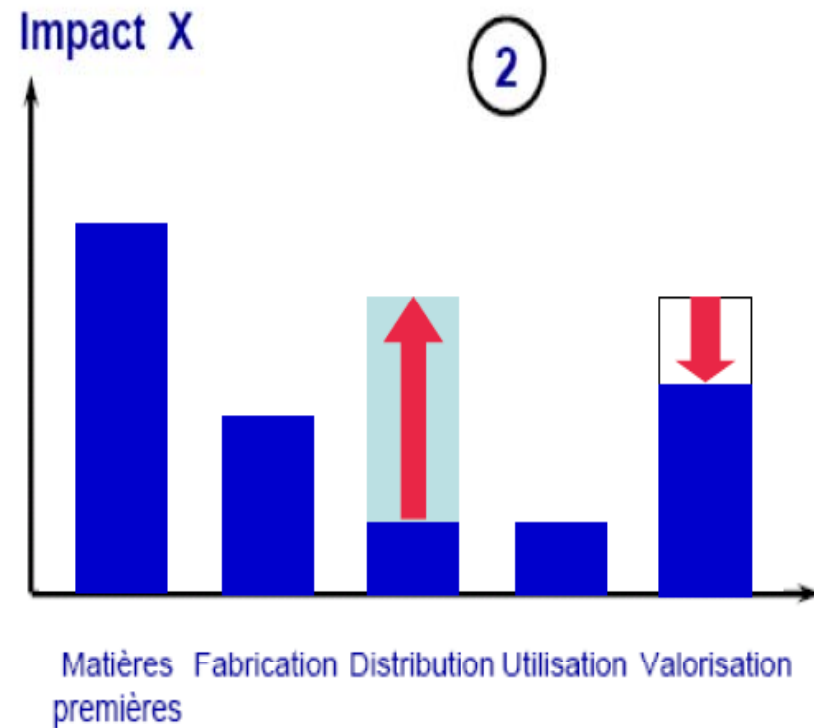
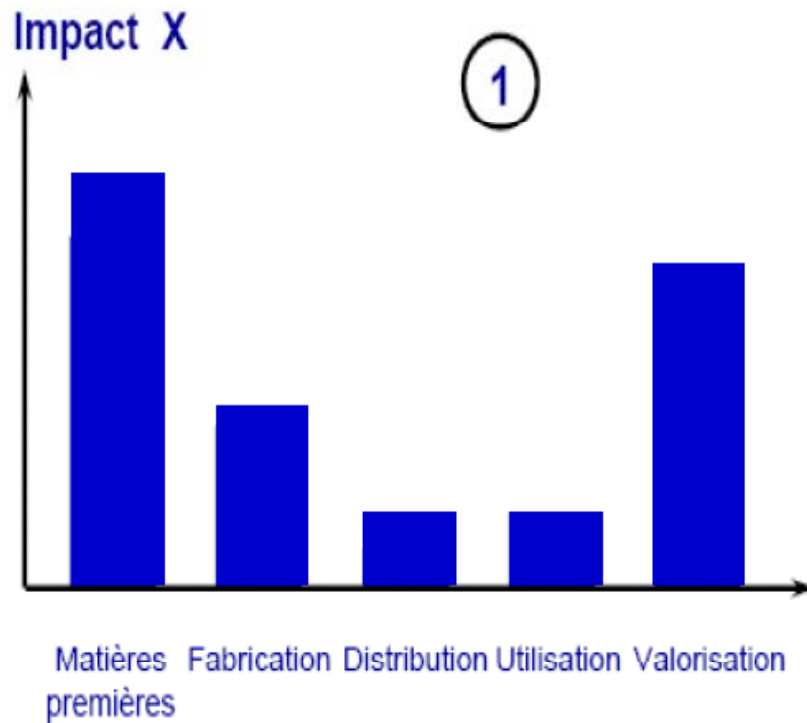
‘The definition of “packaging” shall be further based on the criteria set out below. The items listed in Annex I are illustrative examples of the application of these criteria.

 - (i) Items shall be considered to be packaging if they fulfil the abovementioned definition without prejudice to other functions which the packaging might also perform, unless the item is an integral part of a product and it is necessary to contain, support or preserve that product throughout its lifetime and all elements are intended to be used, consumed or disposed of together.
 - (ii) Items designed and intended to be filled at the point of sale and “disposable” items sold, filled or designed and intended to be filled at the point of sale shall be considered to be packaging provided they fulfil a packaging function.

FUNCTIONS
RISK

LIFETIME
END OF LIFE

**2004/12/EC: AVOID IMPACTS TRANSFER OR GREEN WASHING:
THE MULTI-FUNCTIONAL APPROACH ON LIFE CYCLE ASSESSMENTS & COSTS
(LCA & LCC ON THE VALUE CHAIN)**



LCA are SMART but you will “always” find Indicators which “devalue” the Design (Water: The fish evaluation?)

Source: Bag shop Study	BAG PE Classic	PAPER	BIO-POLYMER
FOSSILES CONSUM	1	1	0.6
WATER CONSUM	1	3.3	0.9
GREEN HOUSE GAS	1	1.9	0.9
AIR ACIDIFICATION	1	2	0.8
WATER POLLUTION	1	12	9

**IS THE FISH IN THE
VALUES CHAIN ?**

THE PACK: MUTI-FUNCTIONAL TO ADD VALUES

VALUE = QUALITY (FUNCTIONS 100% FULLFILL) / COSTS

ECONOMY	PILOTE VALUES
SOCIETY	PILOTE VALUES
ECOLOGY	PILOTE VALUES

- 1) SAVE FOOD SUPPLY
- 2) USE EFFICIENCY AND SAVE RESSOURCES
- 3) SECURE STOCK FOR TOMORROW
- 4) SEQUENCE STOCK AND STORAGE TO AVOID BIG LOSSES/RISKS
- 5) STOCK VALUABLE GOODS
- 6) INFORM THE CONSUMER ABOUT THE PRODUCT
- 7) EXCHANGE PRODUCTS & VALUES
- 8) SEDUCT GAIN THE CONSUMER (ADD VALUE FOR PACKER)
- 9) HELP THE CONSUMER TO CONSUME (CONVENIENCE)
- 10) CONSERVE GOODS DURING ITS SHELF LIFE
- 11) TRANSPORT
- 12) PROTECT AGAINST AGRESSION, AGEING
- 13) ADD SERVICES AND VALUES TO THE PACKED PRODUCT
- 14) ALLOW SUSTAINABILITY ALONG THE VALUES SUPPLY CHAIN (TEMPS)
- 15) LAWS: INFORM & RESPECT
- 16) ALLOW FAIR PRICE TO PERCEIVE CORRECTLY VALUES OF GOODS

FUNCTIONS DEPLOYEMENT ON THE LIFE CYCLE & VALUE CHAIN

FUNCTIONS	LIFE CYCLE (VALUE CHAIN)	ACTORS FOR COSTS/VALUES
RESSOURCES OPTIMIZING	RAW MATERIALS	BUYER
LAWS IMPLEMENTATION	TEMPS NOMENCLATURES	MANAGEMENT, R&D
COMBINE FUNCTIONAL ITEMS	CONVERTER	R&D, PRODUCTION
PROTECT PACKED PRODUCTS	CONVERTER	R&D, REFERENTIALS ISO
ENABLE QUALITY OF FUNCT.	CONVERTER	REFERENTIELS ISO
PACK EFFICIENCY (SIGMA)	PACKING	PACKER
STOCK PACKED PRODUCTS	STOCK	MAGASIN
TRANSPORT PRODUCTS	TRANSPORT	TRANSPORT
REDISTRIBUTE VALUES	RETAILER	RETAILER
ATTRACT BUYING ACTS	SHELF	RETAILER
INFORM CONSUMER	CONSUM-ACTOR	CONSUMER
CONVENIENCE	CONSUM-ACTOR	CONSUMER
VALORISE WASTES	COMMUNAUTEY	ECO-PACK SYSTEMS
	SOCIETY (INCOME TAXES)	(GREEN DOT)

FUNCTION: SAVE GOODS



WIN: SHELF LIFE - TRANSPORT

FUNCTIONS TO ADD VALUES

EASE
TRANSPORT

*Faciliter
le transport*



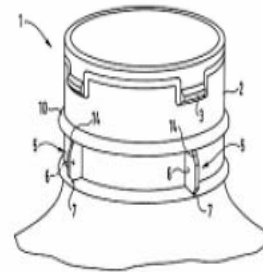
INFORM

Informer



SECURE

Sécuriser



RECLOSABLE

*Rendre
service*



Faciliter la vente



ECONOMICAL: HELP TO SELL

CASE STUDY: FUNCTION RECLOSABLE - 5 EXPERIMENTS

1) NO CAP ! 2) X=TODAY PP 3) X'= PP with less TEMPS 4) A1 = PVC 5) A2 = PLA



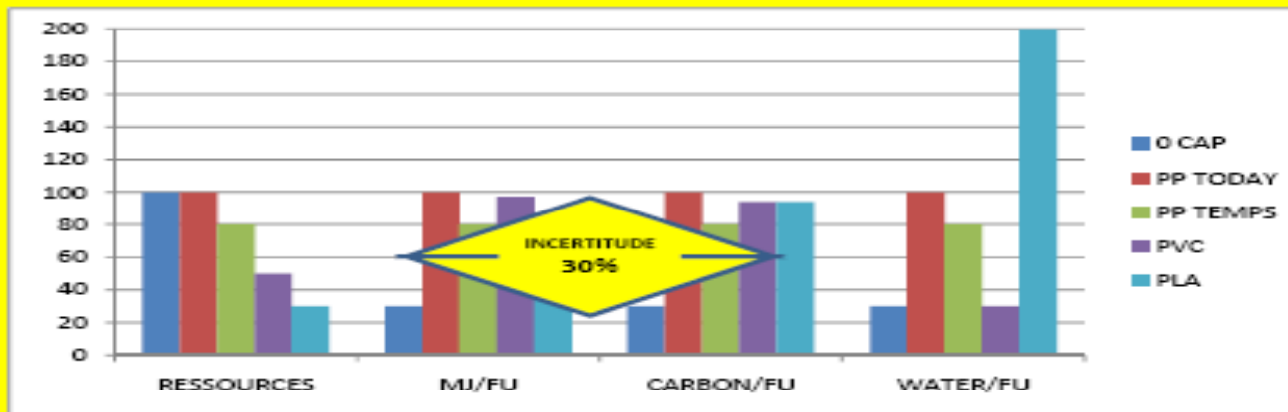
Materials Profiles	0 NO CAP	X CAP WITH PP	X' LESS PP	A1: RECYCLE PVC	A2:RENEW PLA
PRICE: USD/Kg	+	2.2	- TEMPS%	1.6	3
FUNCTIONAL PROPERTIES	INCLUDE IN BODY	RECLOSE Y=GOOD	?	?	?
FOSSILES RESERVES	+	1.25 E9 T	- TEMPS%	50% LESS	RENEWABLE
EMERGY/KG Mat + Prod.	+	85+8	- TEMPS%	80+10	53+10
CO2 Kg/Kg	+	2.7+0.7	- TEMPS%	2.4+0.8	2.4+0.7
H2O USAGE	+	100	- TEMPS%	30	200
RECYCLING %	?	6	?	5	0

**DATAS, TOOLS & INDICATORS
MUST BE SMART TO GIVE CORRECT VALUES
= SMART WORKFLOWS ANALYSIS
IS A MUST TO AVOID GREEN WASHING**



ECONOMY	PILOTE VALUES
SOCIETY	PILOTE VALUES
ECOLOGY	PILOTE VALUES

	0 CAP	PP TODAY	PP TEMPS	PVC	PLA	INCERTITUDES
RESSOURCES	100	100	80	50	30	30%
MJ/FU	30	100	80	97	70	30%
CARBON/FU	30	100	80	94	94	30%
WATER/FU	30	100	80	30	200	30%
RECYCLING/FU	100	100	100	95	0	60%
PRICE	0	100	80	70	140	50%
RECLOSABLE	100	100	100	100	100	50%

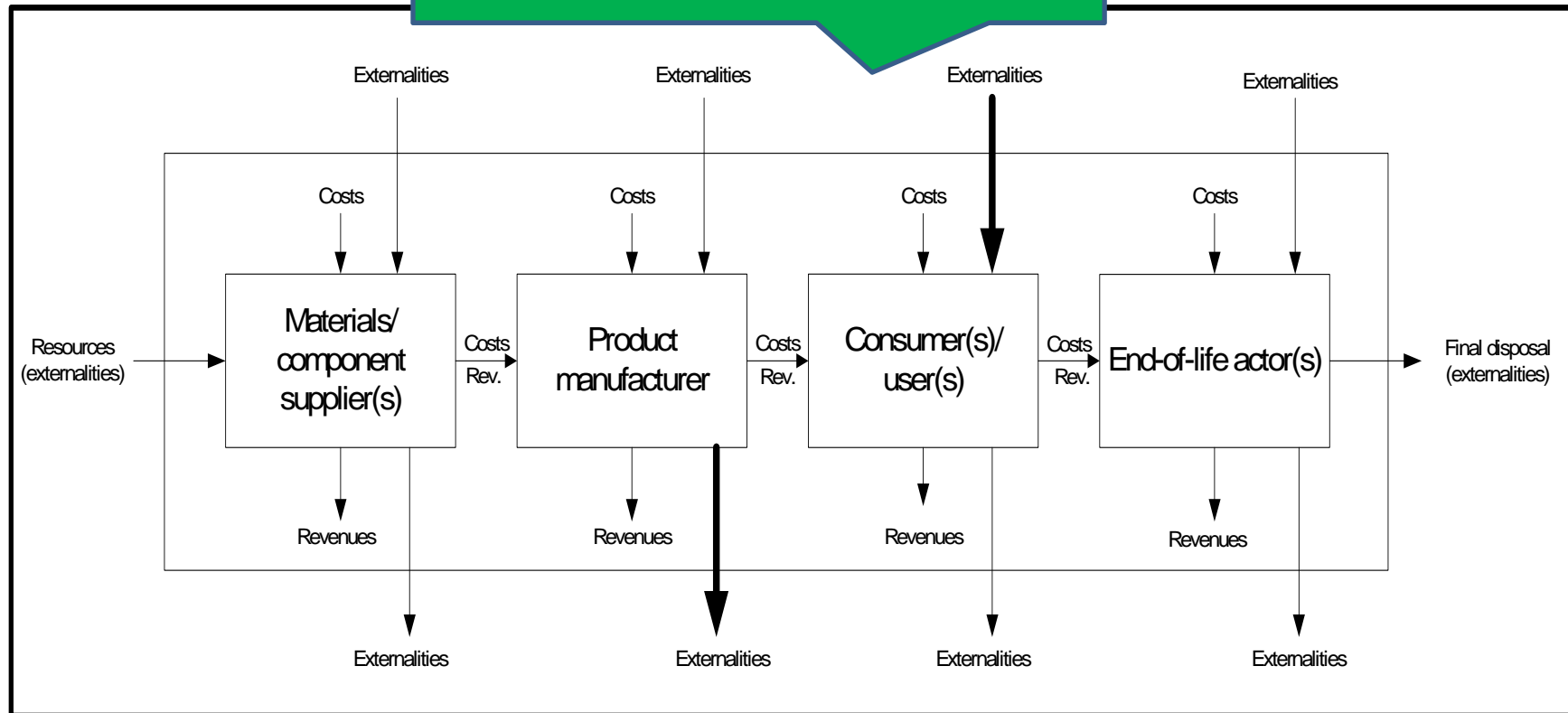


**WITH 30%
INCERTITUDES
IMPOSSIBLE
TO
CHOICE
VALUES !**


SMART WORKFLOWS ANALYSIS = LCA – LCC

PACK CASE STUDY „FUNCTION RECLOSABLE“ WITH COMPONENT „TEMPS“ OPTIMIZED

WORKFLOWS ANALYSIS IN LCA - LCC



 Economic system = boundaries of LCC

 Social and natural system: boundaries of social and environmental assessment

LCA – LCC OF CASE STUDY: NOMENCLATURES WITH AND WITHOUT T.E.M.P.S

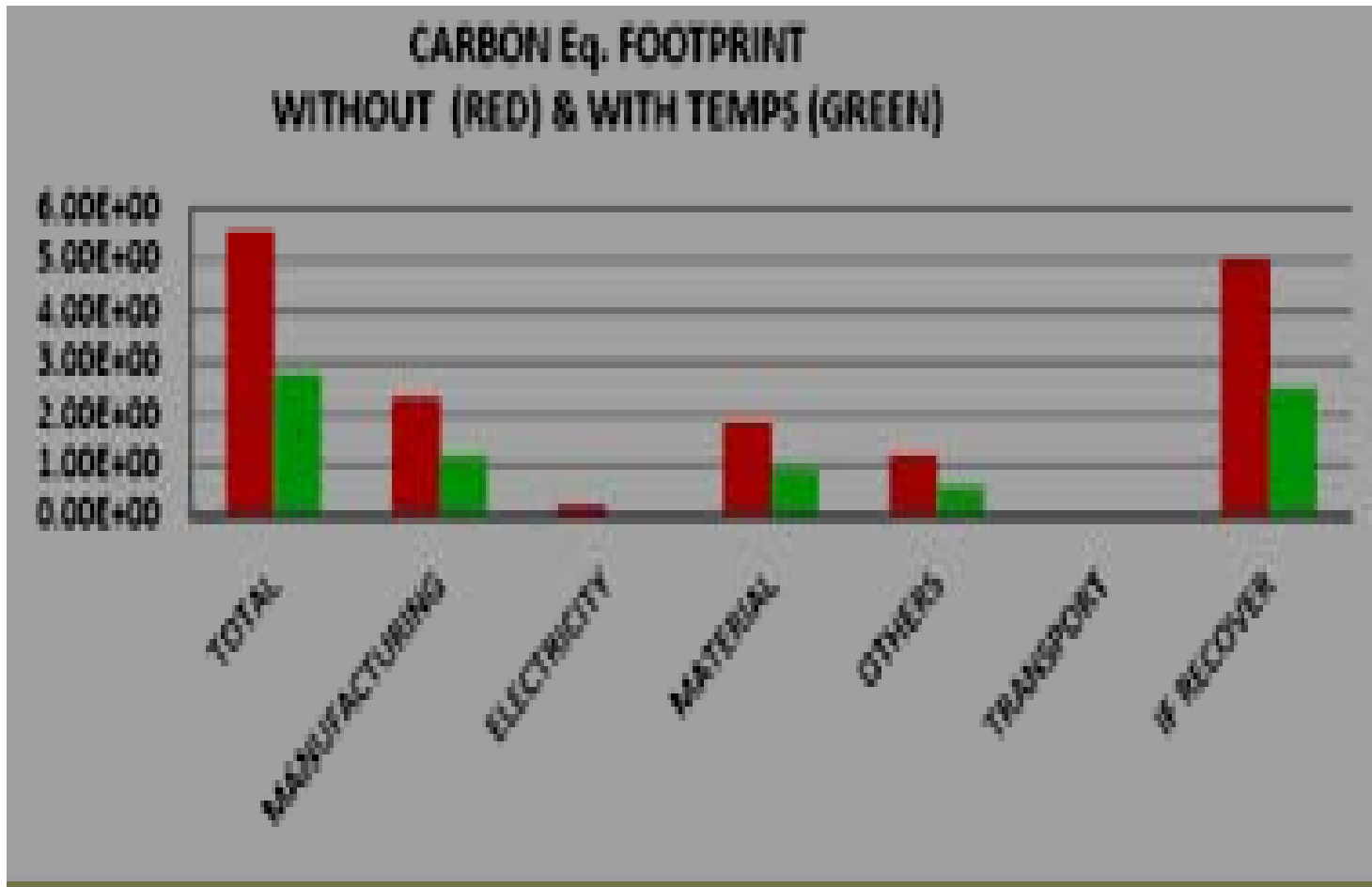
INPUTS	UNITS	COSTS & ECO-TAXES	Today Data commented	Data with + TEMPO
Energy				
electricity supply	Origin or special Contract	€/Kwh		
electricity value USED/YEAR for the product	Kwh		Greece Network	
thermal energy- Fuel type			1592,22 kwh	1497,48
thermal energy value USED/YEAR for the product	MJ / % used for the Product			
Compressed air	m3		Natural gas	
fuels	Kg Liter	€/Liter	1748,19 MJ	1660,79
Diesel for USED/YEAR for the product			not measured	
Material Input:				
PP used for USED/YEAR for the product	Kg	€/Kg	0 lit	
Auxiliary material:				
Inks USED/YEAR for the product	Kg	€/Kg	8863,2 kg	8553
Solvents USED/YEAR for the product	Kg			
Water USED/YEAR for the product	Kg L		1316 Kg (395 kg of solids)	1224
Adhesives USED/YEAR for the product	Kg		70 kg	70
OUTPUTS				
Product Value USED/YEAR for the product	Kg	€/Kg	517 kg	517
Total scrap USED/YEAR for the product	Kg	€/Kg		
Recovery USED/YEAR for the product (VOC / PP)	Kg		9775 kg	9775
Waste				
hazardous waste	Kg	€/Kg	506 kg	506
industrial waste	Kg		21 Kg VOC / 0 PP	21
Emmissions to air (TARGETS ISO14001)				
		ECO-TAXES	77,7 kg	72
CO, CO2	Kg	CO2 TAXE: 15€/T	367,5 Kg	354,6
CH4	Kg			
VOC	Kg	ECO-TAXES	not measured	
PACK FUNCTIONAL UNIT (1 BAG of PRODUCT)				
		GREEN DOT	0,366 kg	0,366
annual production	Kg - How much Kg pro FU (gsm)			
product weight	gsm			
description of functional unit	Bag dimensions sqm	RATIO PRODUCT/PACK		
Production hours per day	% Occupacy	RATIO Kg Product/Surfacic mass	235542 m2 / 9775 kg brutto	
REPORT MAIN DEPARTMENT STANDARD OPERATIONAL PROCESSES PERFORMANCES				
TARGETS ISO14001	TODAY / TARGET	Savings in ECO-TAXES		0,049980667
TARGETS ISO14062 (2004/12/ec)	TODAY / TARGET	Savings in Green Dots	75gr / 0,1027 m2 (367mm x 280 mm)	
TARGETS ISO9001: QUALITY COSTS & IMPROVES	TODAY / TARGET	Savings in ROQ & ROI	0,265 h/day	
TARGETS ISO26000 / SD21000 / AFAQ1000NR	TODAY / TARGET	Winning ETHICS, MOTIVATION		
TARGETS ISO22000 / SECURITY ...	TODAY / TARGET	winning RISKS		

**LCA – LCC OF CASE STUDY: INVENTORIES WITH AND WITHOUT T.E.M.P.S.
COURTESY OF PARTNER: www.ecomundo.eu**

CDP 30072009 PACK PP CAP						
Ecodis Inventory <input type="checkbox"/> include electricity <input type="checkbox"/> include materials <input type="checkbox"/> include others						
		Total	Manufacturing Process	Electricity	Material	Others
Inputs						
Material resources	Carbon dioxide [kg]	3.80E-01	0	4.74E-03	3.51E-01	2.35E-02
Outputs						
Inorganic emissions to air	Carbon dioxide [kg]	1.67E+04	0	1.78E+03	1.48E+04	1.05E+02

CDP 30072009 PACK WITH OUR + ON TEMPS						
exclude electricity exclude materials exclude others						
		Total	Manufacturing Process	Electricity	Material	Others
Inputs						
Material resources	Carbon dioxide [kg]	3.78E-01	0	4.50E-03	3.51E-01	2.23E-02
Outputs						
Inorganic emissions to air	Carbon dioxide [kg]	1.61E+04	0	1.69E+03	1.43E+04	9.98E+01

**LCA – LCC OF CASE STUDY: CARBON FOOTPRINTS WITH AND WITHOUT T.E.M.P.S.
COURTESY OF PARTNER: www.ecomundo.eu**



LCA – LCC: VALORIZE YOUR “TEMPS” STRATEGY ALONG THE LIFE CYCLE (VALUE CHAIN)

TOXICS POTENTIAL	ENERGY EFFICIENCY	MATERIAL INTENSITY	PROCESSES EFFICIENCY	SUSTAINABILITY VALUES
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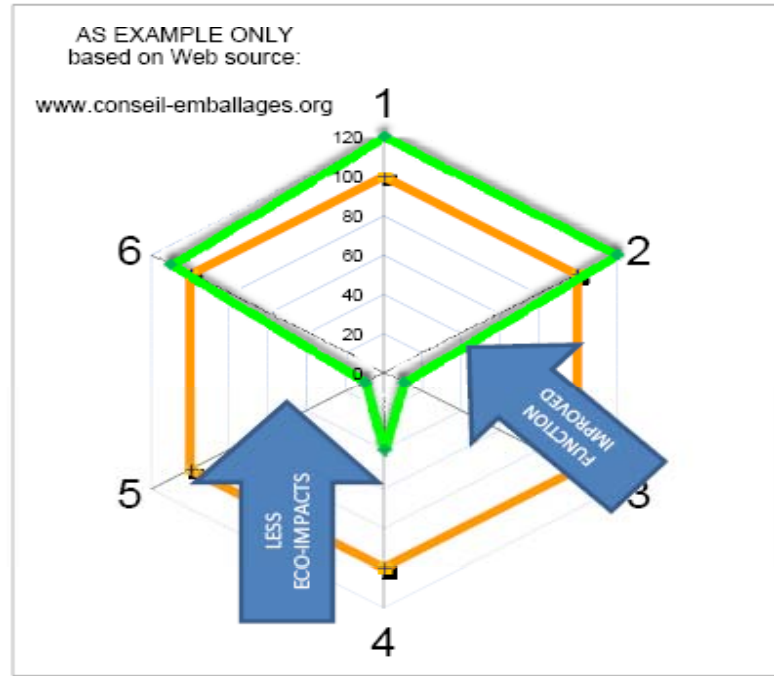
T.E.M.P.S. IMPACTS LEVEL (BUSINESS AS USUAL)							
SAVINGS TEMPS YOUR ADDED VALUES « + »							
VALUES CHAIN ACTORS		RESSOURCES	PROD	LOGIS	DISTRI	USE	REUSE

YOUR TEAMS ARE THE PILOTE OF VALUES THROUGH THE LIFE CYCLE

T: Taxes for Environmental issues E: Energetical costs M: Ressources and Materials Costs

P: Processes Costs S: Costs for risks and chances on Sustainability Values

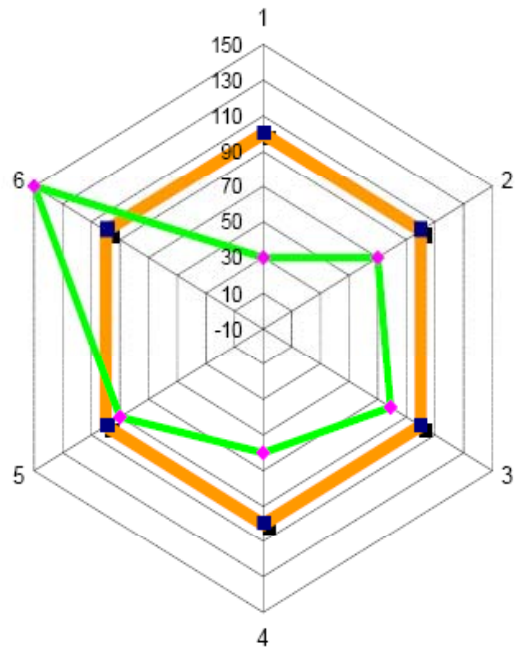
MULTI-FUNCTIONAL APPROACH : SOURCE : CNE www.conseil-emballage.org



1. MATERIAL SAVING		100		120
2. EMERGY SAVING		100		120
3. FUNCTION REQUESTED: REST OF PRODUCT IN PACK		100		10
4. GHG FOOTPRINT (CO2 Equivalent) MAY BE A CONSEQUENCE OF 3 !		100		40
5. OPTIMISATION VOC SUBSTANCES USED		100		10
6. RECOVERY AT END OF LIFE (WITH TODAY SYSTEM)		100		110

MULTI-FUNCTIONAL APPROACH- source: *CNE* www.conseil-emballage.org

EXAMPLES based on Web source:
www.conseil-emballages.org



BETTER IF SORTING

DESIGN BM (1)
or BEFORE

RE-DESIGN (V2)
ECO CONCEPTION

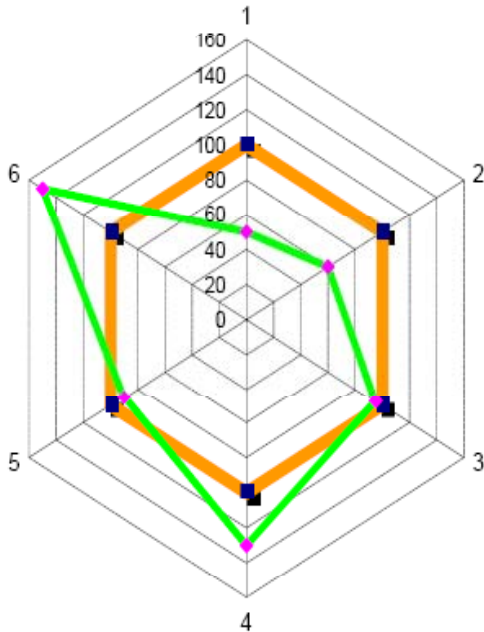
1. MATERIAL WEIGHT DIAGNOSTIC % T=YEAR
2. ENERGETICAL DIAGNOSTIC
3. TRANSPORT IN USE (SPECIAL: TRUCK 21%)
4. GHG FOOTPRINT
5. OPTIMISATION VOC SUBSTANCES USED
6. VALOR EOF (WITHOUT SELECTIVE COLLECTION)

100
100
100
100
100
100

30
70
79
60
90
150

MULTI-FUNCTIONAL APPROACH- source: *CNE* www.conseil-emballage.org

EXAMPLES based on Web source:
www.conseil-emballages.org



BETTER IF RENEWABLE STRATEGY



- 1. MATERIAL WEIGHT DIAGNOSTIC % T=YEAR
- 2. ENERGETICAL DIAGNOSTIC
- 3. TRANSPORT SALES UNITS (SPECIAL: TRUCK 5%)
- 4. FOSSILES RESOURCE DEPLETION
- 5. OPTIMISATION VOC SUBSTANCES USED
- 6. VALOR EOF (WITH SELECTIVE COLLECTION)

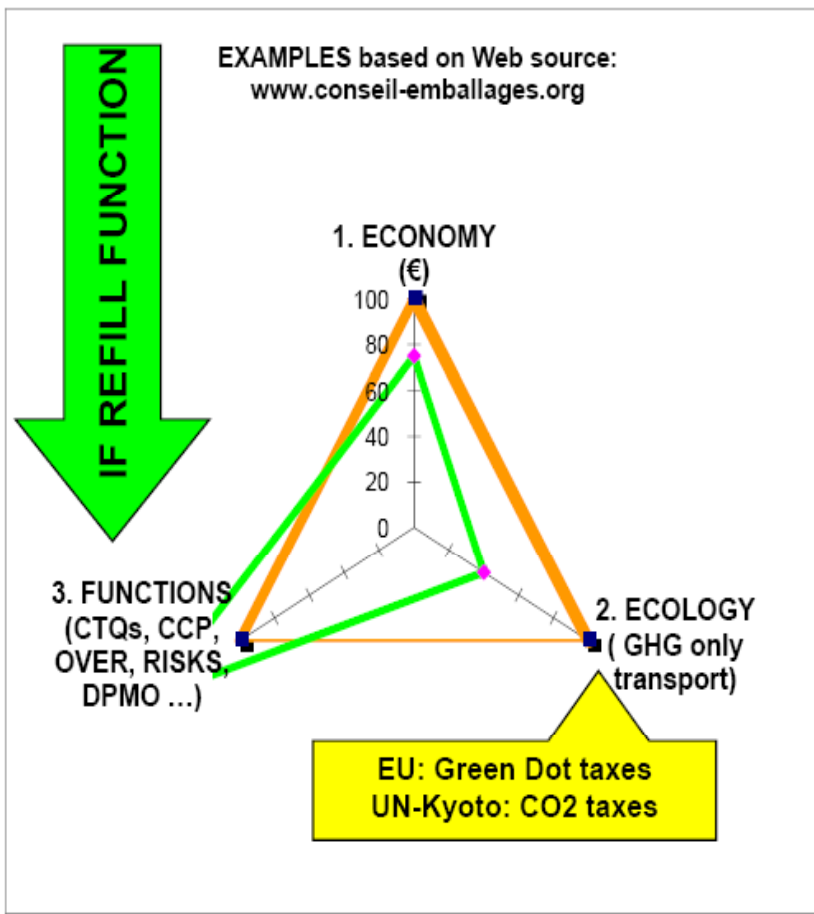
DESIGN BM (1)
or BEFORE

RE-DESIGN (V2)
ECO CONCEPTION

100
100
100
100
100
100

50
60
95
130
90
150

MULTI-FUNCTIONAL APPROACH- source: CNE www.conseil-emballage.org



Sources Reduction Balance					
PACKAGING	SALES UNIT (Primary) Before / After	Secondary	Tertiary	Global	
Grammes	-		-	-	
%	- %		- %	- %	
Tonnes/an	-		-	-	
SYSTEM					
	12%	11%	15		
BEFORE: X SU/P	Transported volume	Lorries/YEAR saving			
AFTER: Y SU/P	BEFORE/AFTER	BEFORE/AFTER			
			RENEW	REDUCE	REMOVE
			B/A	B/A	B/A
			REFILL	RECYCLE	RECOVERY



**DESIGN BM (1)
or BEFORE**



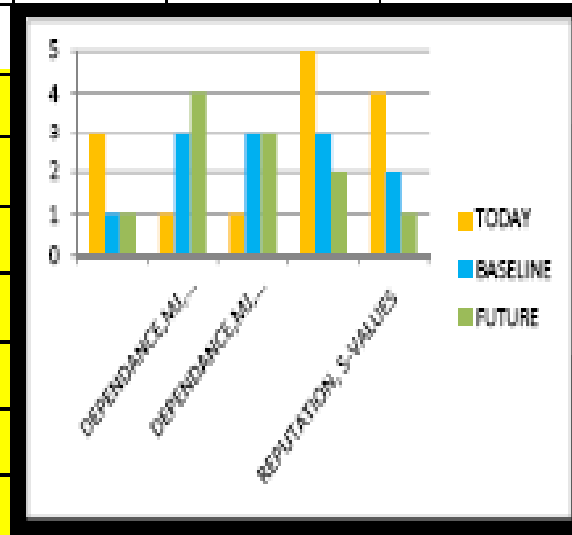
**RE-DESIGN (V2)
ECO CONCEPTION**

1. ECONOMY (€)	100	75
2. ECOLOGY (GHG only transport)	100	40
3. FUNCTIONS (CTQs, CCP, OVER, RISKS, DPMO ...)	100	150

CHALLENGE FOR « ECO-LABELS »: INTEGRATE COSTS/VALUES OF EXTERNALITIES: T & S DUMPINGS

	VALUES	INDICATORS	TODAY	BASELINE	FUTURE
TOXICS	BAT LEVEL	REACH, CO2, H2O, VOC & MORE	3	1	1
ENERGIES	COSTS €	DEPENDANCE, MJ, KWH, CO2	1	3	4
MATERIALS	COSTS €	DEPENDANCE, MJ, H2O, CO2, ...	1	3	3
PROCESSES	COSTS €	AQL, MJ, H2O, CO2 + AIR, SOIL	5	3	2
SUSTAINABLE VALUES	6 "RE" LEVEL	REPUTATION, S-VALUES	4	2	1

CHALLENGES FOR ECO-LABELS		PRICE
LESS TOXICS	HOW TO VALORIZE?	ADDED VALUES (& TAXES)
		ECO TAXES (GREEN DOT, TIPP)
MORE S-VALUES		BENEFITS
RETURN ON INVESTMENT		6 M
ROI ?	EXTERNALITIES	PROCESSES
EXTERNALITIES :		MATERIALS



T and S of T.E.M.P.S. : COSTS OF EXTERNALITIES VALUES ?

CALCULABLE RESPONSES FOR INDICATORS	POSSIBLE COSTINGS (REFERS TO STERN REPORT)	LOCAL ECO-TAXES VALUES ASSESS.	LEGAL REGULATED LIMITS
DEPLETION OF NON-RENEWABLES	GENERATIONS, PLANET LOSS	NO VALUES ASS.	NONE
GREENHOUSE EFFECT	100 YEARS - €	CO2, VOC	NONE
STATOSPHERIC OZON DEPLETION	COSTS TO REPAIR, REPLACE	REPLACE CFC,...	CFC (PARTIALLY)
AIR ACIDIFICATION	COSTS TO REPAIR	NONE	NONE
PHOTO CHEMICAL OXYDATION	COSTS TO REPAIR	NONE	NONE
EUTROPHICATION WATER	COST TO REPAIR	NONE	NONE
HUMAN TOXICITY	YEARS OF LIFE LOSTS	NOT APPLICABLE	YES-TOXICAL
HEAVY METAL	CARCINOGENIC POTENTIAL	NA	YES
DUST	HUMAN HEALTH EFFECTS	NONE	START NANO LEG
DIOXINE	H.H.E	NA	YES-TOXICAL
AQUATIC ECO-TOXICITY	COSTS TO REPAIR	LOCAL VALUES	LOCAL
SEDIMENT ECO-TOXICITY	COSTS TO REPAIR	LOCAL VALUES	LOCAL
TERRESTRIAL ECO-TOXICITY	COSTS TO REPAIR	LOCAL VALUES	LOCAL
PRIMARY ENERGY	ENTROPY - S – ENERGY EFFICIENCY (MEEP)	NONE	NONE
FOSSIL ENERGY	COSTS TO REPLACE, RENEW	NONE	NONE
CONSUMPTION OF RAW MATERIAL	COSTS TO REPLACE RENEW	GREEN DOTS –LOCAL	LOCAL
MUNICIPAL & INDUSTRIAL WASTES	COSTS TO RECOVER	LOCAL VALUES	YES
HAZARDOUS WASTES	COSTS TO ELIMINATE INCINERATION	LOCAL VALUES	YES
INERT WASTES (REJECTS)	COSTS TO ELIMINATE LANDFILLS	NONE	

EXTERNALITIES

ECO-LABELS: COMMUNICATE & DEFEND YOUR VALUES TO SUSTAIN YOUR ECO-PACK BUSINESS

