C2C for food packaging

Added-value?

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C2C & food packaging

To design and implement efficient reusable food packages

- Positive:
  - Attempt is made to close the carbon cycle for food packaging

- Negative:
  - Food safety
    - We might endanger consumers!
  - Packaging is only small part of the environmental impact
    - We might actually increase the environmental pressure

Why do we like C2C?

Packaging and environment

- Consumers perception:
  - packaging (waste): major environmental concern
    - “Waste mountains”

- Because it is visible
- And the environmental benefits are invisible:
  - Avoiding food spoilage: 1,000,000,000 kg / year (NL)
  - Avoiding energy loss: 25,000,000 GJ / year (NL)

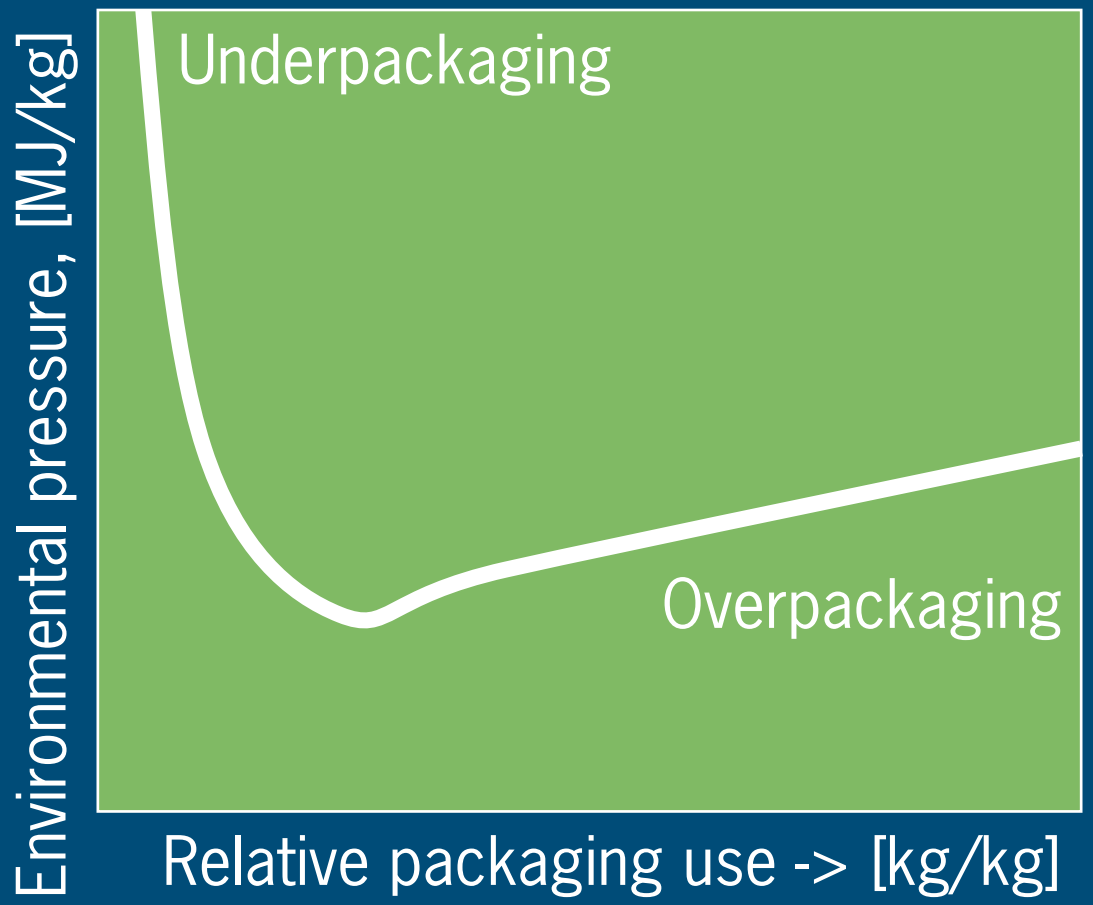
Environmental impact of consumer activities

- Perceived importance
  - Recycle bottles, cans
  - Avoid dropping litter
  - Clear up litter
  - Re-use bottles
  - Avoid creating waste
  - Fewer car journeys
  - Use public transport
  - Turn off electricity
  - Walk / cycle
  - Use water wisely

- Actually important
  - Reduce private transport
  - Choose fuel efficient car
  - Energy savings at home
  - Avoid wasting foods / goods

Mori, 1999

Schematic diagram of packaging use

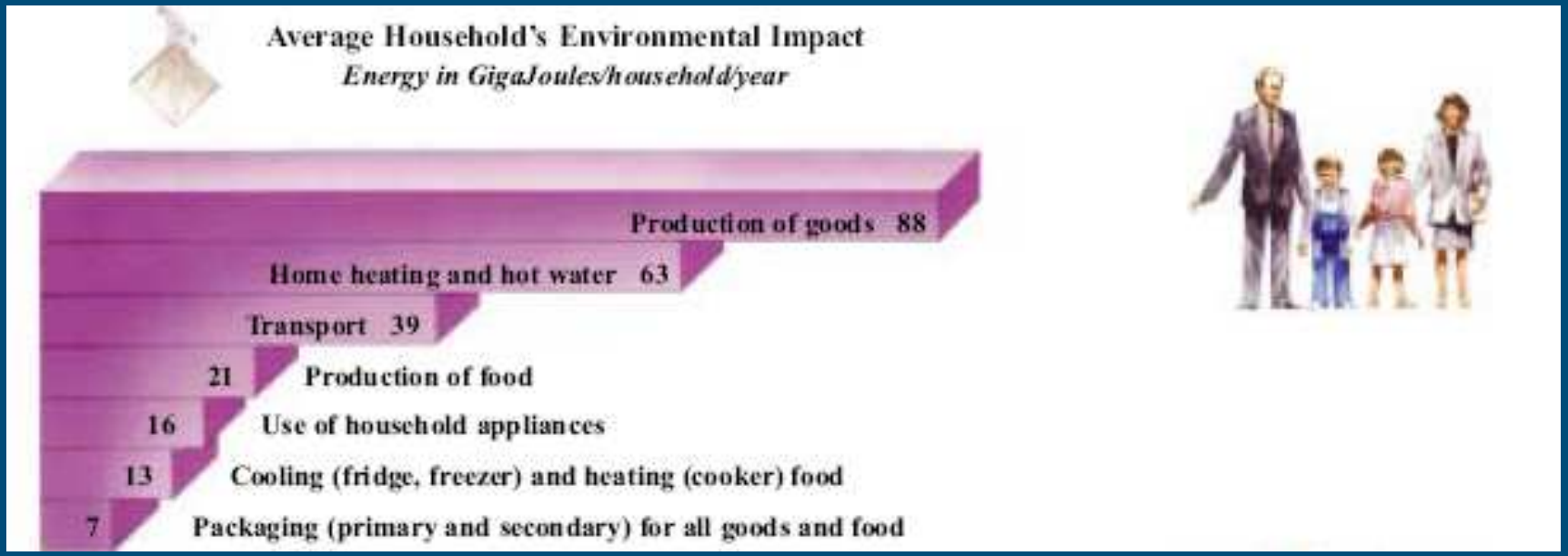


Why should we worry about C2C?

Recycling food packaging = hazard

- Glass and PET bottle return systems
  - More than 10 years of R&D was necessary to control the hazard of using returnable bottle systems
    - Motor oil
    - Pesticides
    - Urine….
  - But the environmental benefit is heavily debated
    - Additional transport and washing energy <-> material reuse

Environmental impact of food chains



Food products contain much more energy than packaging

Example 1

- Egypt air / Caïro, 2006, precise waste statistics

Waste	Amount, [ton]	EI [MJ/kg]	RP [MJ/kg]	Netto [TJ]
Plastic	313	90	45	14
Food	284	70	0	20
Paper	88	45	18	2
Aluminium	39	195	-	7

Example 2: environmental impact of a Dutch lunch

Article	Embodied energy of package [MJ/pack.]	Energy loss through shrinkage [MJ/pack.]
Milk cup	0,420	0,080
Bowl soup	0,000	1,200
2 bread slices	0,017	0,096
Butter cup	0,066	0,009
2 slices of cheese	0,150	0,060
Jam cup	0,060	0,011
Sub total	0,713	1,456
Total	**2,169 MJ / lunch**	

Example 3: Meat MAP transition in NL

	1994, 5% MAP	2005, 50% MAP	Difference
Meat shrinkage			
Weight [1000 tons/ yr]	40.7	29.4	-11.3
Value [million Euro / yr]	285.2	205.8	-79.4
Energy content [PJ / yr]	2.85	2.06	-0.79
Packaging			
Weight [1000 tons / yr]	13.8	19.2	+5.4
Costs [million Euro / yr]	37.0	78.6	+41.6
Energy content [PJ / yr]	0.62	0.86	+0.24

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Protective packages reduce the environmental pressure

Environmental urgency:

- Forbid:
  - Shopping with a car
  - Flat screen TV's
  - Gravel gardens
  - Extensive showering….
- Promote:
  - Local grown products
  - The use of MW ovens over gas stoves
  - Public transport….

But: not popular and invisible

But packaging is visible !

EarthShell PACKAGING

EASTAR BIO copolyester

BASF

Trespaphan

BIOP Biopolymer Technologies AG

biotrem

eurea

Potatopak

PLANTIC Plastic from plants

ucb

Autobar

BIOTEC

napac nature to nature

PaperFoam

KU GREEN

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How should we use C2C for food packaging

- As source of inspiration and action
  - but not as “hollow marketing”
- Product developers
  - Try to find compromises between packaging material use and protection
    - Bag-in-box concepts
    - Bottles from PET: virgin / recycled / virgin
    - Yoghurt cups made from rigid carton and flexible plastic liners
    - Carton laminate in stead off glass jars

How should we use C2C for food packaging 2

- On the national level:
  - Promote post-separation of plastic waste
    - From one cradle to another
  - Promote re-use of separated plastic waste and restrict export
- Dutch household garbage collection system is efficient but underutilised as re-use system!

Thank YOU!

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