

Plastics' contribution to climate protection

Do plastics contribute to sustainability?

General Assemblée Fechiplast, Affligem

23-March-2011

aafko.schanssema@plasticseurope.org

PlasticsEurope
Association of Plastics Manufacturers

Important question: Are plastics sustainable?

Societal perceptions:

- Largely made of non-renewable resources;
- Oil refining and cracking is energy intensive;
- Plastics are using up most of the oil
- Plastics emit large amounts of GHG
- Plastics waste often ends-up in landfill or is littered
-



Official Partner



CORRIERE DELLA SERA
ANTEPRIMA - IL GIORNALE DI DOMANI
GIOVEDÌ 10 OTTOBRE 2006
LINGUA ITALIANA

Un Oceano di plastiche

23 February 2008
Journalist: Roberto Iurlani

Supermarkets challenged to produce waste breakdown

Rael Rjayan
TV, arrogance and
Sir Alan Sugar
Page 32

Nan Goldin
I only shoot the
people I love
Page 24

the guardian

Biodegradation is the solution for all environmental hazards

Everything should be mechanically recycled. Plastics link plastic food waste with cancer

Leven zo

«Plastic is gevaarlijk voor milieu én onze gezondheid»

NOW IT'S WAR ON PACKAGING

OOSTENRIJKER BEGINT KRUISTOCHT TEGEN KUNSTSTOF MET FILM 'PLASTIC PLANET'

MYTH: Packages are waste, therefore, they should be eliminated.

Pacific wildlife threatened by sea of plastic

No thanks

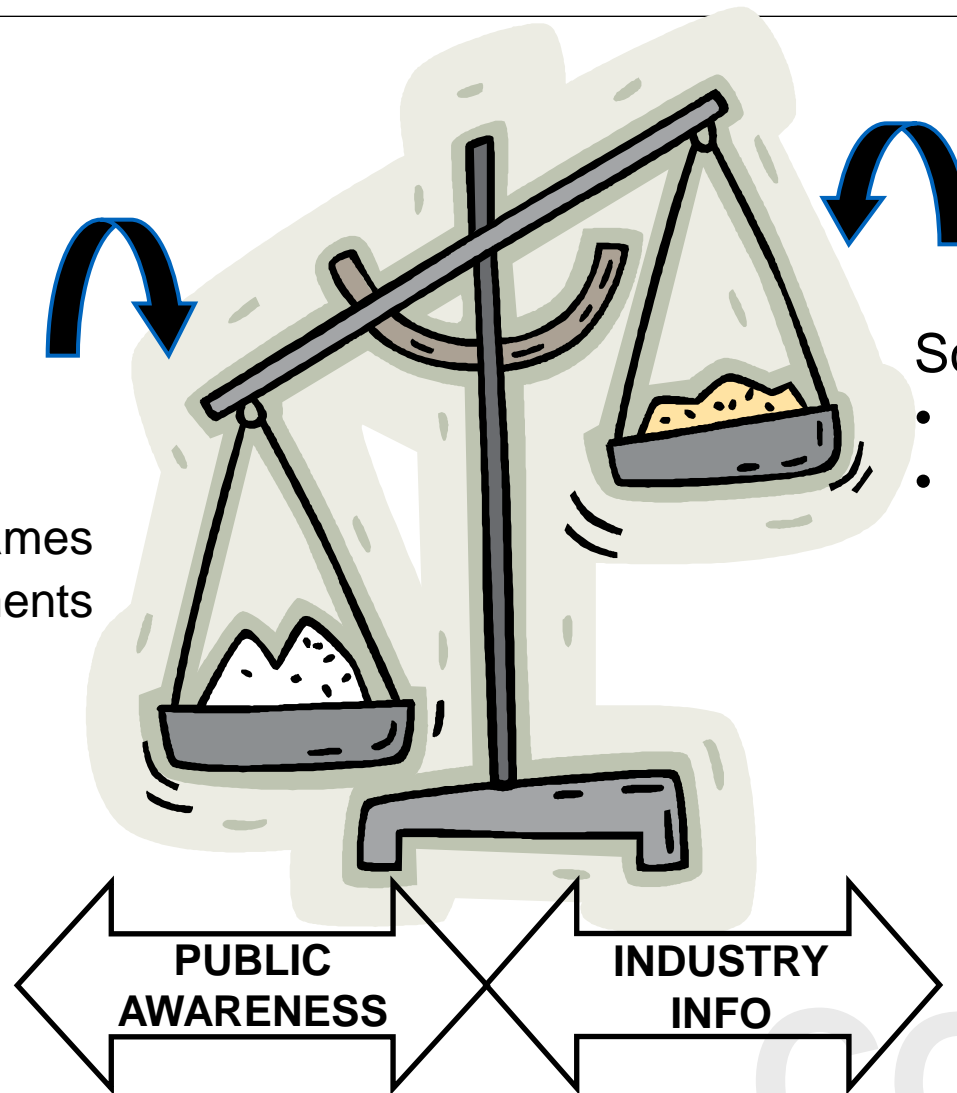
Journalist: Catherine Fode
March 2008



“The Great Ecological Debate”

Concerns

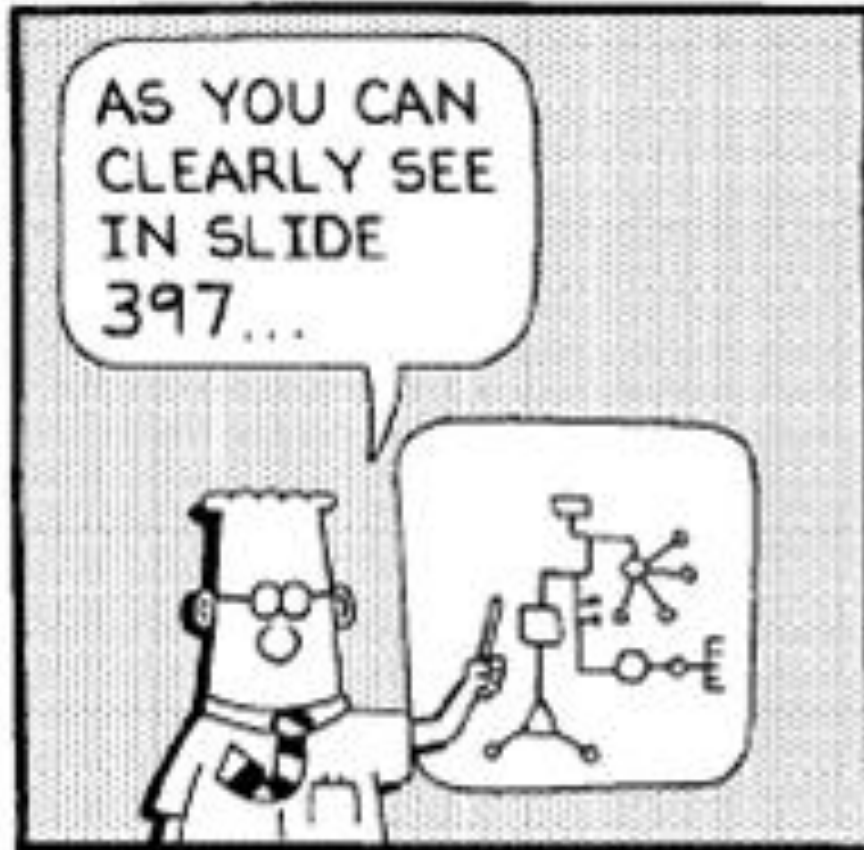
- Single indicator
- Variable time frames
- Perception elements



Science based

- Multiple criteria
- Life Cycle Thinking
 - LCIs
 - EPDs/LCAs

Balance the discussion...



- Consider all steps in the life cycle



Consider all criteria:

- Environmental: GWP, ODP, AP, NP, POCP,.....land use, bio diversity
- Human Health
- Resources & scarcity/depletion



A simple example

Plastics packaging: When **more** is less

On average only 1 to 3% of the weight of a packaged product in plastics comes from the packaging:

- A plastic film of 2g packages 200 g of cheese
- A plastic bottle of 35g packages 1.5 liter of drinks

Inclusive the logistic packaging, it grows up to 3.56% on average



Without plastics, retailers' fleets would make 50% more journeys



“Plastics contribution to Climate Protection.”

Denkstatt A.G., Vienna, 2009
commissioned by PlasticsEurope

- **Part 1:** Rough quantification of effects on energy and GHGs, if plastics were theoretically substituted with other materials
(an update of the comprehensive 2005-GUA/denkstatt-study "The contribution of plastic products to resource efficiency")
- **Part 2:** Additional evidence of the beneficial aspects of plastics for energy efficiency & climate protection
- **Critical Reviews by:**
 - Adisa Azapagic (University of Manchester, UK)
 - Roland Hischer (EMPA Sankt Gallen, CH)



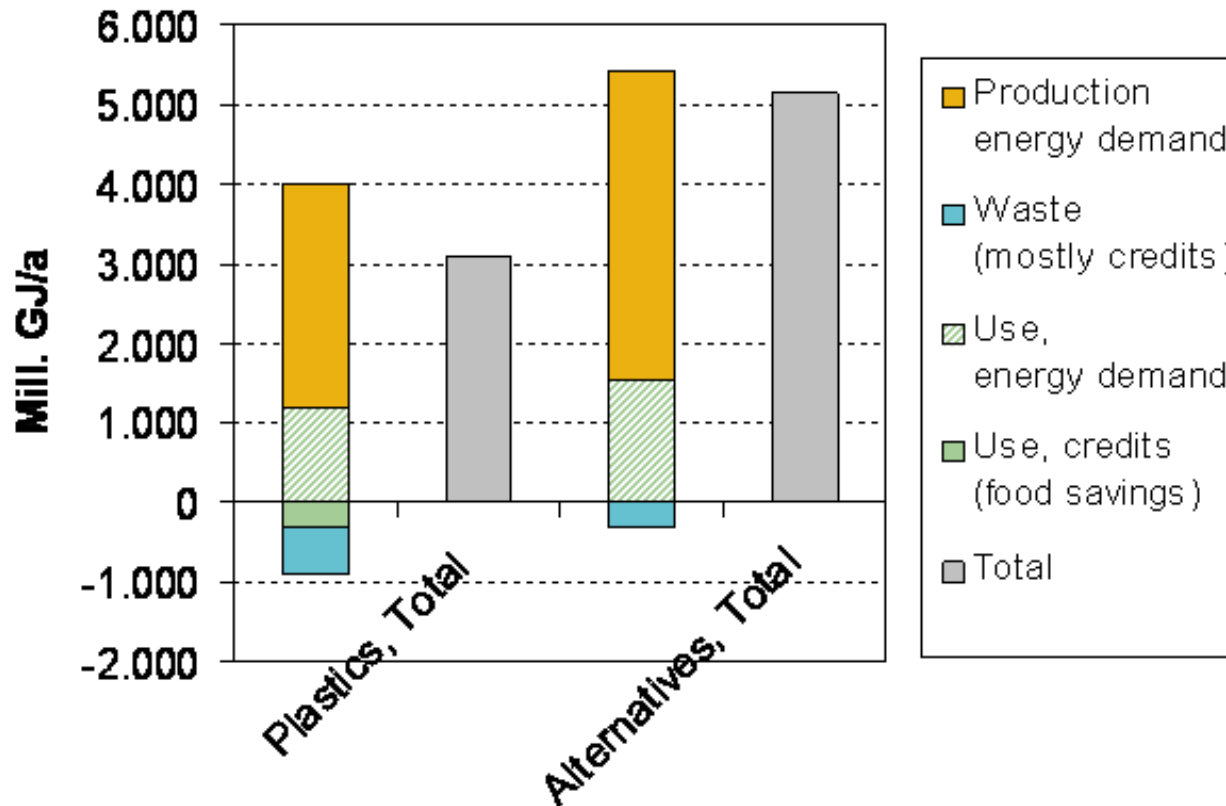
- Demonstrate that the use of plastics can in many cases actually help **save resources** across the whole life-cycle.
- Convince that the use of even current **fossil fuel based plastics** do indeed make a significant positive contribution to goals of energy efficiency & climate protection.
- Demonstrate that decisions should be based on **Life Cycle Thinking** and not on automatic preferences
- Not to claim an overall material superiority. Often the most efficient solution is a **combination of different materials**.



- covers 80 % of the subject with 20 % of effort
- is limited to investigation of **energy consumption and GHG emissions**
- does not quantify any other environmental impacts
- covers the **whole life cycle**
- is not an LCA according to ISO 14040 & 14044, but follows the principles and is peer reviewed
- is not a comparison for plastics and alternatives in *single* applications in detail, but rather gives a good estimation for the effects of the **total market of plastic products**
- gives **rough indications and trends for application sectors** rather than details on single products

Number of Case Studies and Products analysed

	Number of case studies	Number of analysed products	Case study titles (analysed product groups)
Packaging	7	57	small packaging; beverage bottles; other bottles; other rigid packaging; shrink and stretch films; carrier-bags; other flexible packaging
Building except pipes	3	11	insulation; flooring; windows
Pipes	9	55	big drain & sewer pipes; small drain & sewer p.; big drinking water p.; small drinking water p.; agricultural p.; conduit p.; gas p.; heating & plumbing p.; industry p.
Electric/electronic	2	9	housing; insulation in refrigerators
Automotive	3	18	under the hood; exterior & cockpit; other automotive parts
Housewares	3	8	keep fresh boxes; buckets; waste bins
Furniture	2	7	garden furniture; mattresses
Medicine	2	4	syringe; infusion container
Footware	1	4	soles
Total	32	173	



- ▶ Comparison of plastic products with alternatives
- ▶ split into life-cycle phases

+ : Energy consumption

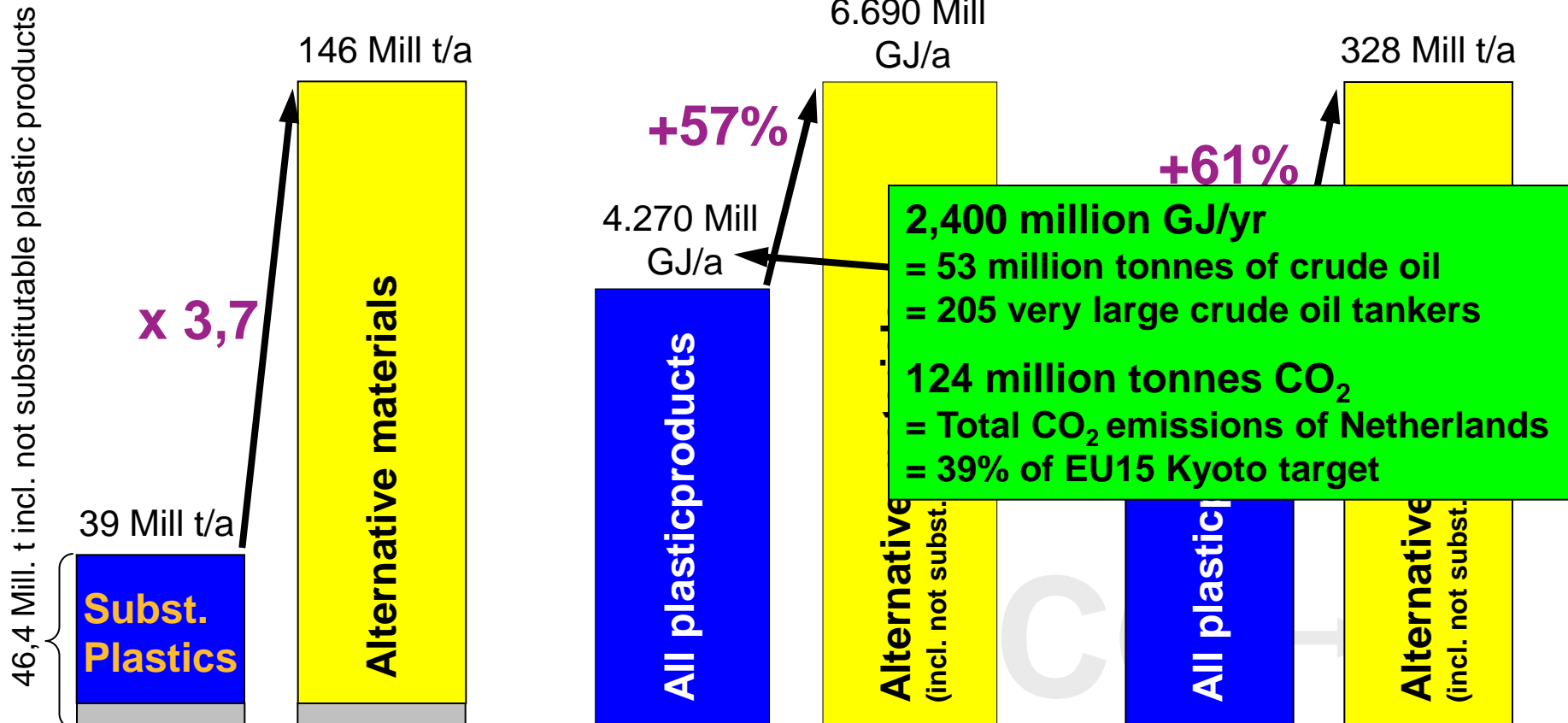
- : Energy credits (prevented food losses / saved primary production / saved production of electricity & heat)

Effect of Substitution of Plastics on mass, Energy Consumption and GHG Emissions

Total mass
for same funct. units

Energy consumption
in total life-cycle

GHG emissions
in total life-cycle

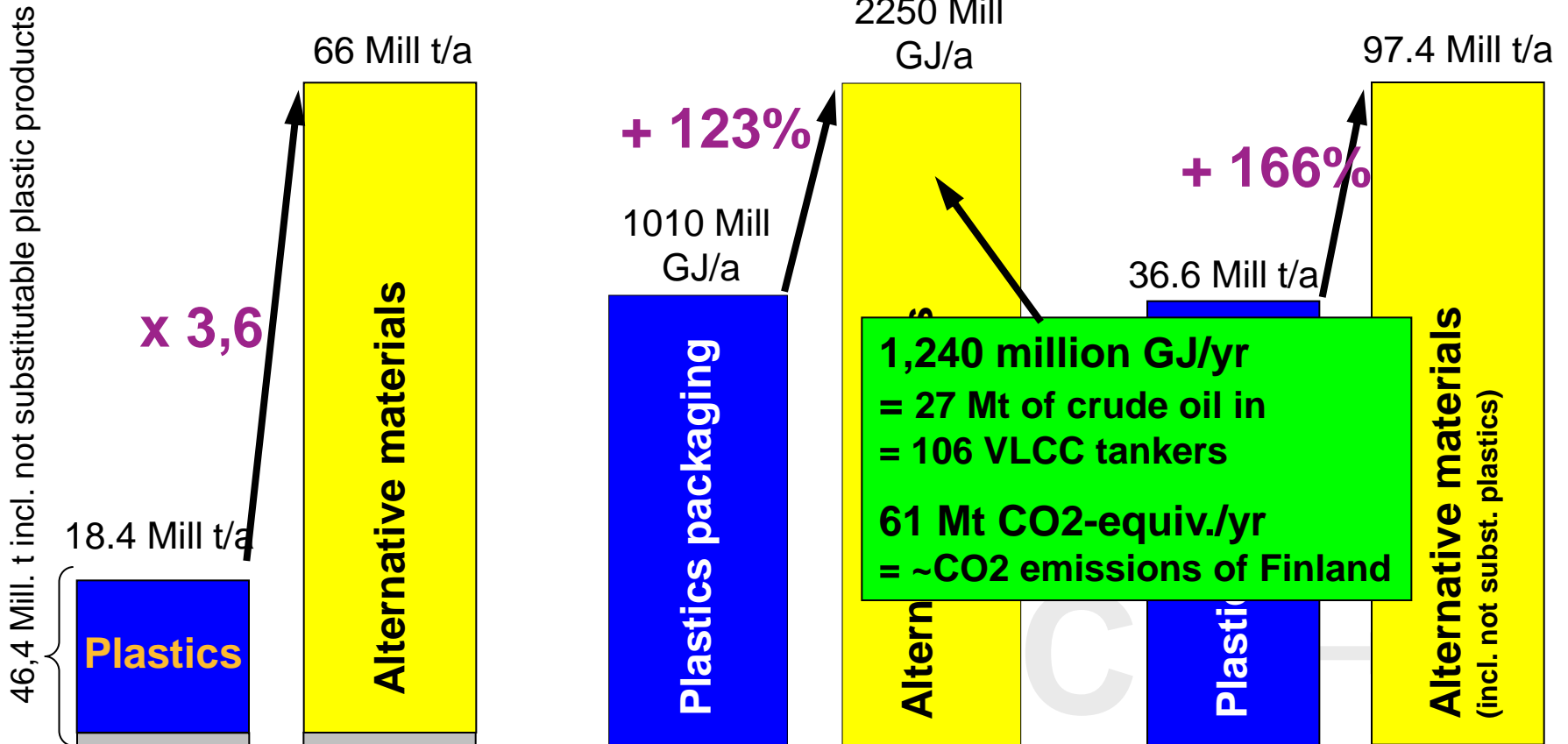


And for substitution of plastic packaging?

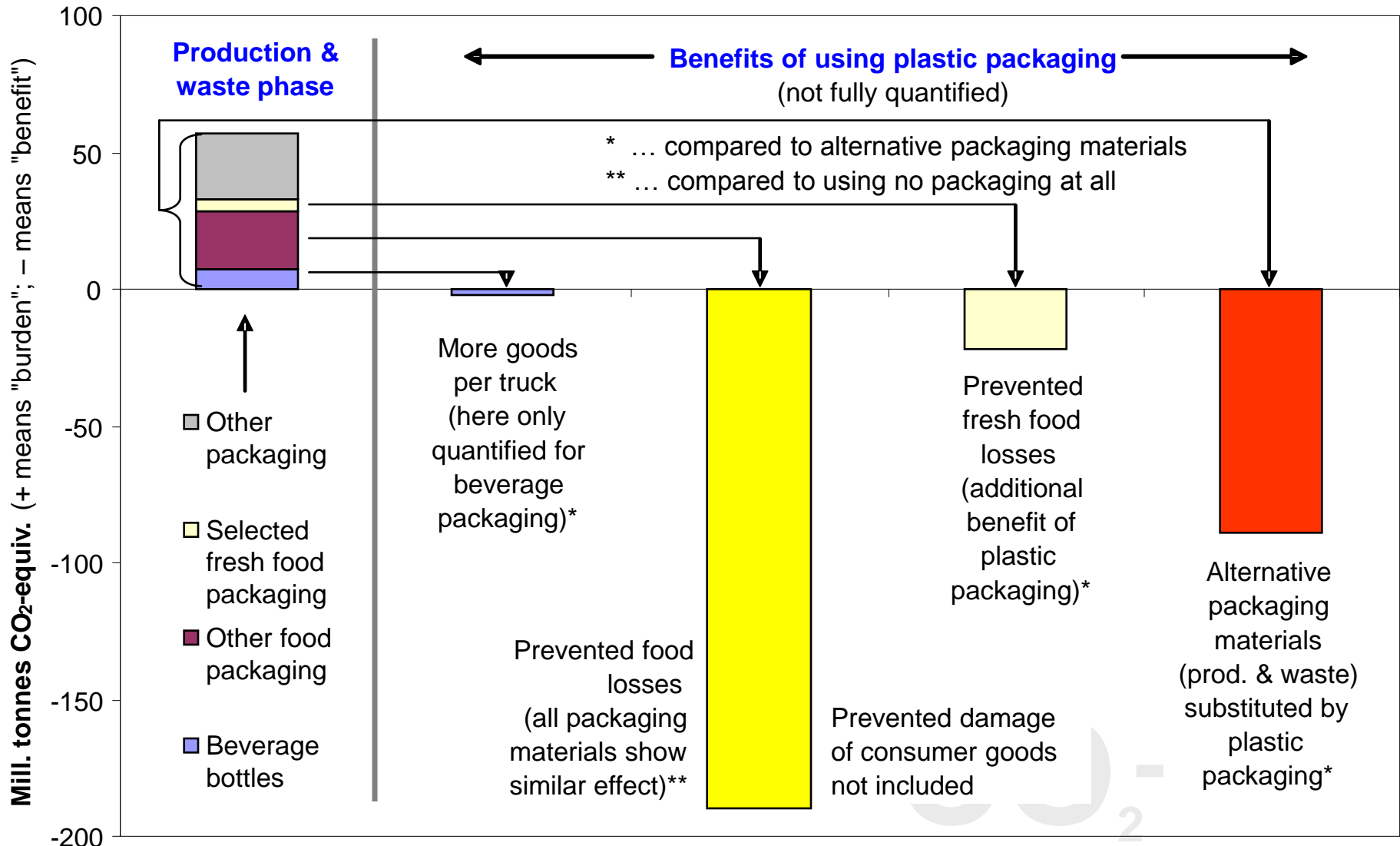
Total mass
for same funct. units

Energy consumption
in total life-cycle

GHG emissions
in total life-cycle

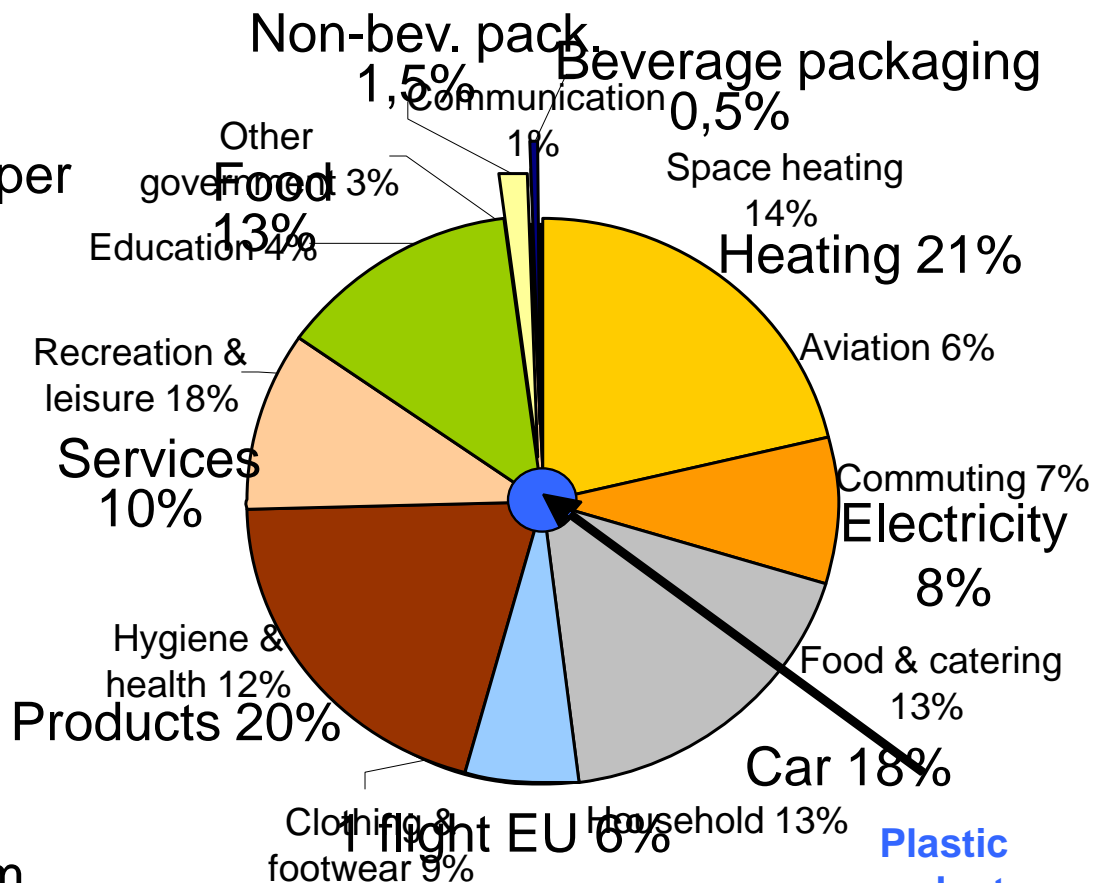


GHG emissions of plastic packaging: production & waste versus use benefits



Relevance of plastic products in total consumer „carbon footprint“

The average consumer carbon footprint for the EU27+2 is approx. 13.7 tonnes CO₂-equivalents per capita.



91 kg per capita result from plastics consumption.

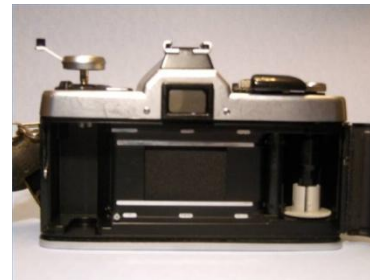
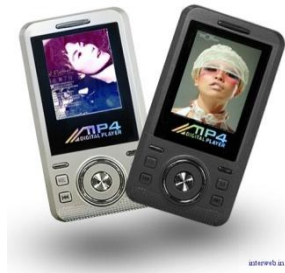


Dematerialisation by innovation: Benefits for energy & GHG emissions

Portable CD-Player (incl. CDs) versus MP3-Player

- Reduction of energy by a factor between 60 and 94.
- Reduction of GHG emissions by a factor between 69 and 106.

Plastics an essential material for both applications

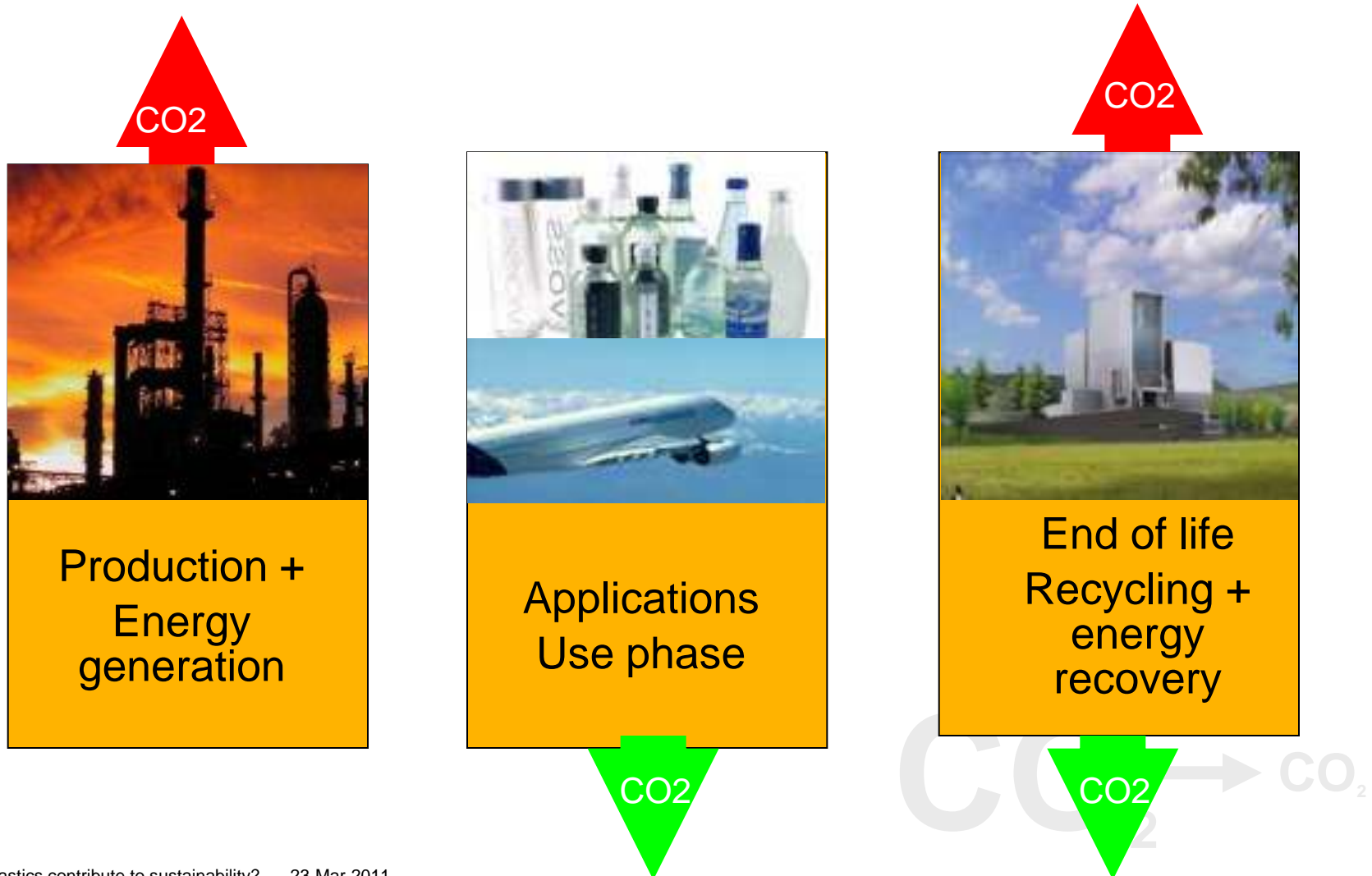


Digitil camera versus a film cartridge

- Reduction of energy by a factor between 26 and 77.
- Reduction of GHG emissions by a factor between 29 and 107. → CO₂

Plastics an essential material for both applications

Plastics: Greenhouse gas balance over the product life cycle



- Plastics enable significant savings of energy and the reduction of greenhouse gas emissions (GHG) mainly in the use phase
- In existing applications plastics are very energy efficient materials.
- Plastics often facilitate reduced material consumption.
- The extraction of feedstock and production of raw materials and plastics is energy intensive, however the savings in the use phase compensate this,
- When using more plastics the reduction of CO₂ emissions would exceed the increased emissions from production and waste management by a factor 9 – 15 in 2020, **the climate change paradox**
- Plastics are an essential material towards sustainability





Plastics

The Material for the 21st Century

