

# The Environmental Impacts of Products and Materials

**Edgar G. Hertwich**, Ester van der Voet, Yuichi Moriguchi, Sangwon Suh, Pawel Kazmierczyk, Jeff McNeely, Mark Huijbregts, Manfred Lenzen

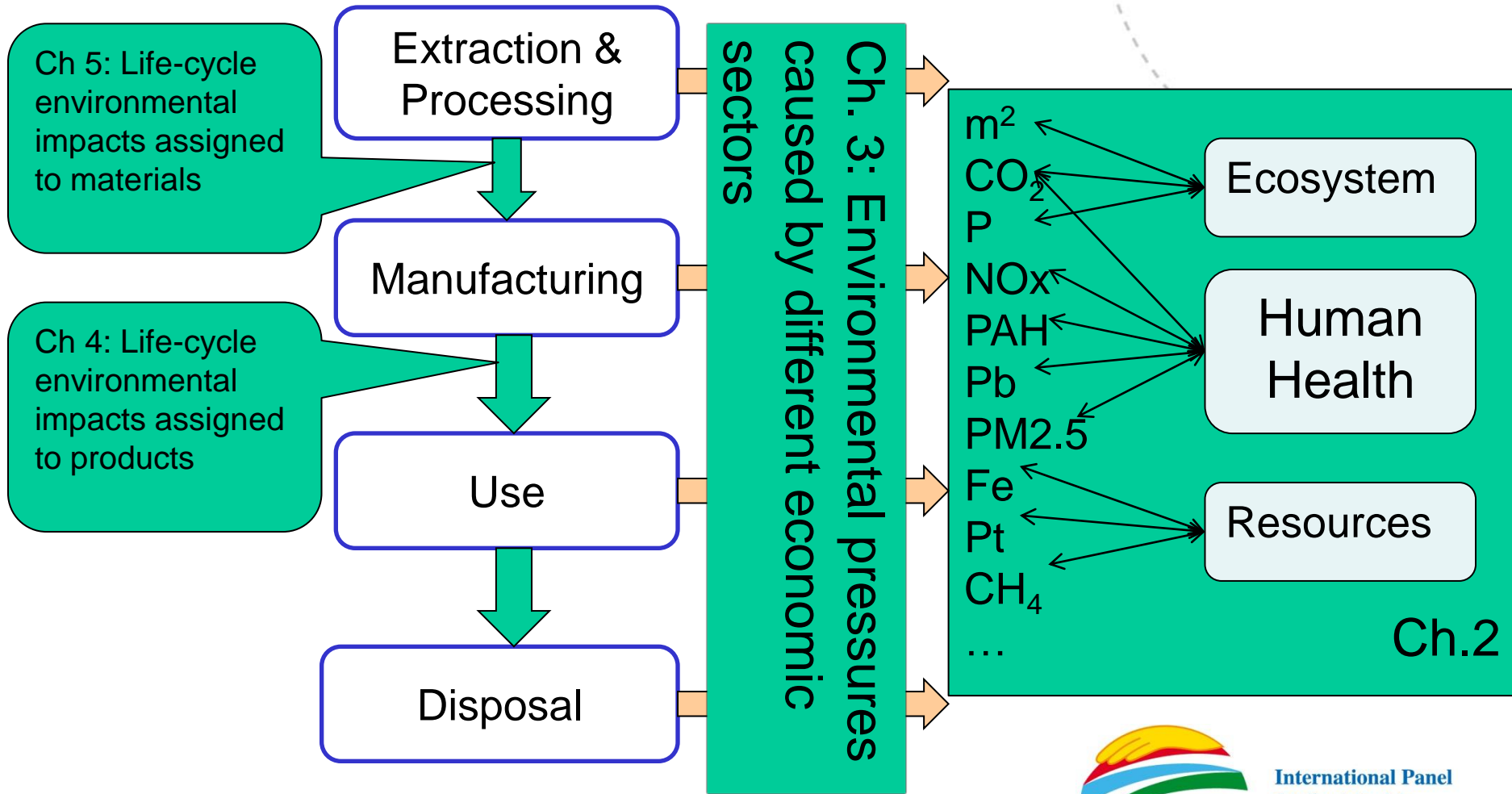
UNEP/OECD Workshop on Sustainable Resource and Materials  
Management

Paris, 1. December 2009



International Panel  
for Sustainable  
Resource Management

# Activities – Materials - Products



International Panel  
for Sustainable  
Resource Management

# Important Pressures

## Ecosystems

- Habitat change
- Climate change
- N,P pollution
- Overexploitation

## Resource scarcity

- Fossil fuel
- Some metals
- Land, water, biomass

## Health

- Poverty & degradation of ecosystem services
- Climate change
- Particulate matter
- Toxic compounds



International Panel  
for Sustainable  
Resource Management

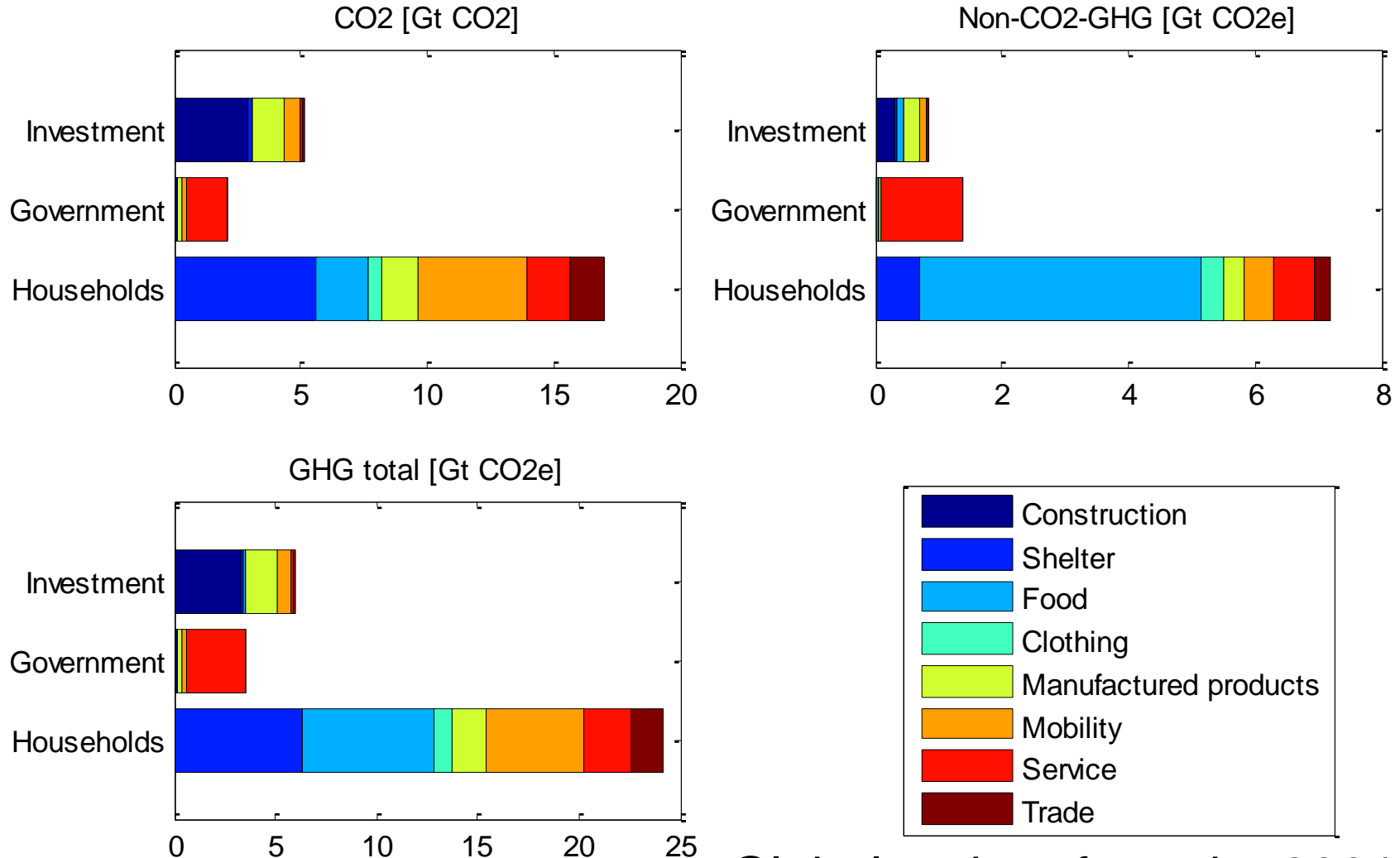
# Important sectors

- Agriculture: habitat loss, water use, eutrophication, climate change
- Electricity production: resource depletion, human toxicity, climate change
- Mining: resource depletion, energy use
- Fishing: overexploitation



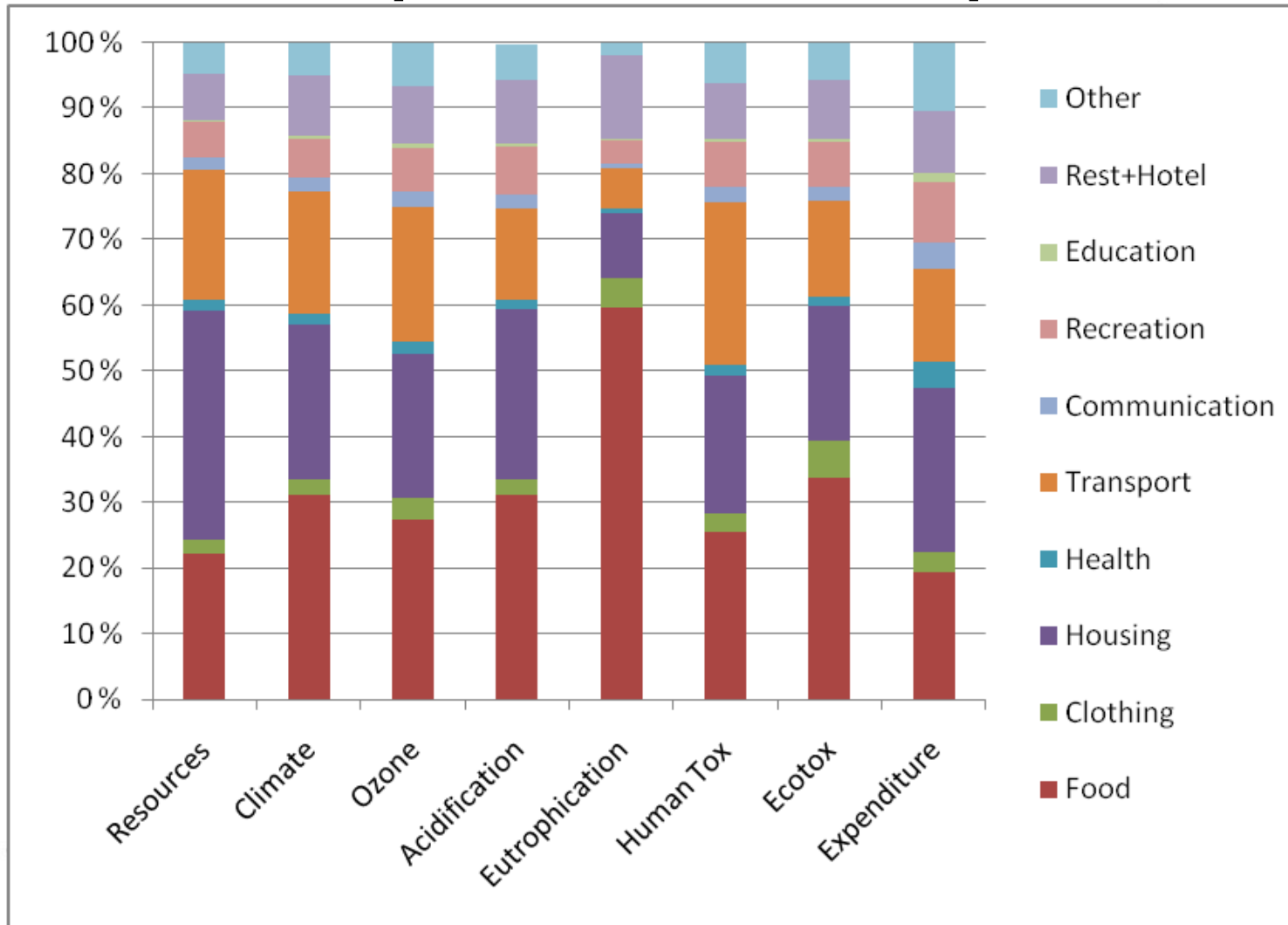
International Panel  
for Sustainable  
Resource Management

# Env. Impacts of Consumption



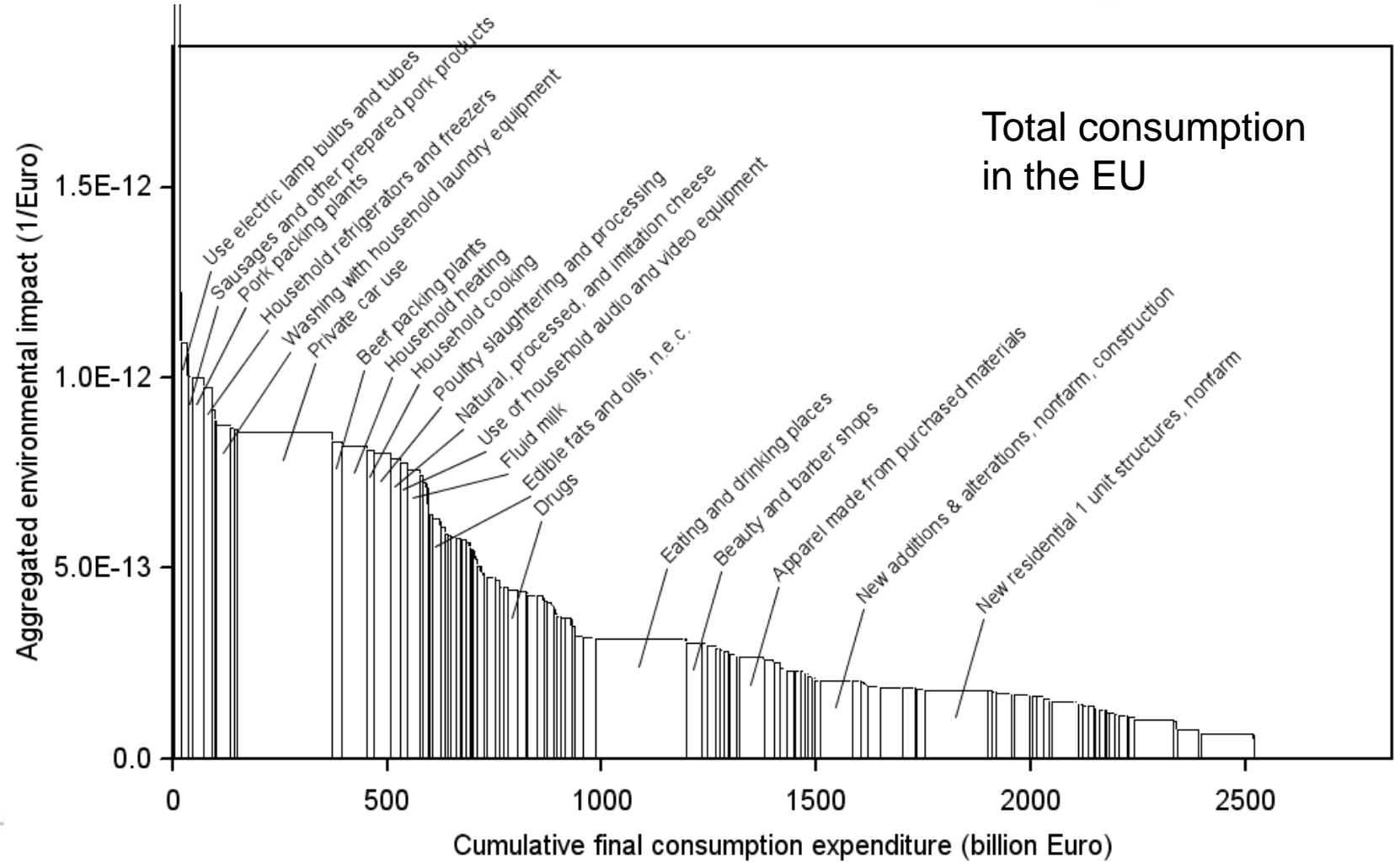
Global carbon footprint 2001

# Multiple impacts from consumption in Europe

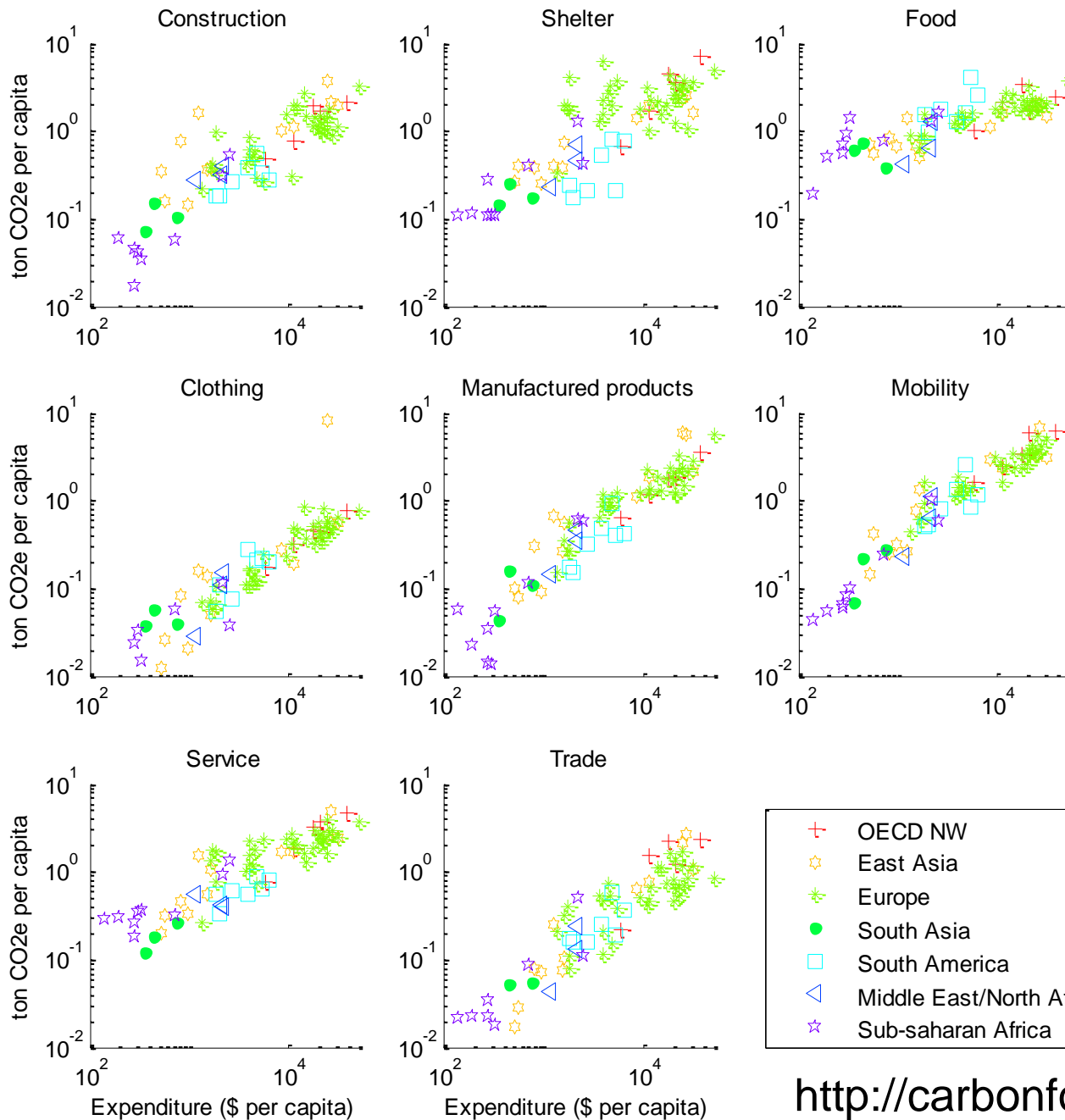


International Panel  
for Sustainable  
Resource Management

# Environmental Impact of Different Categories of Goods



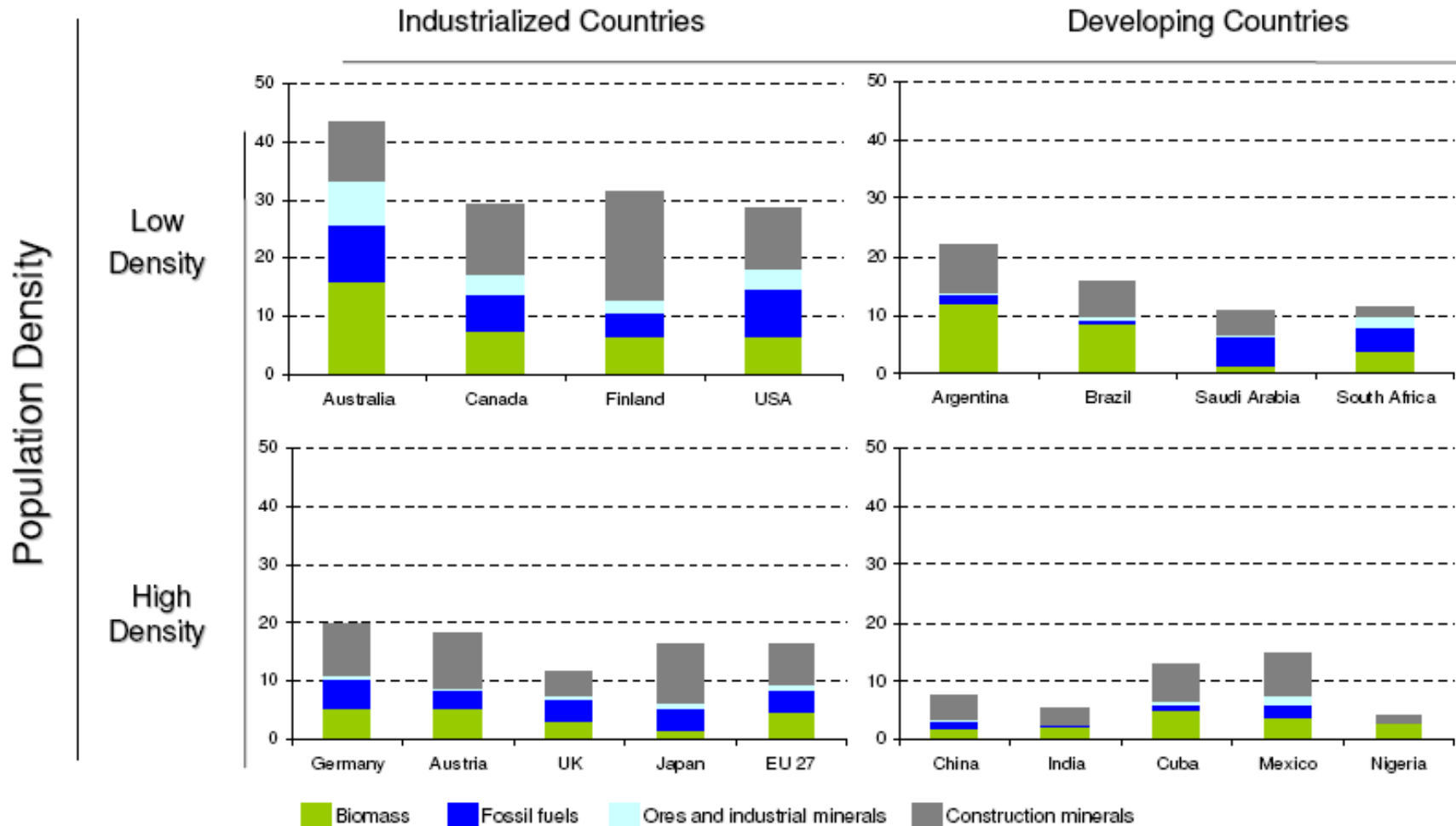
el  
ment



Carbon footprint of consumption across the world

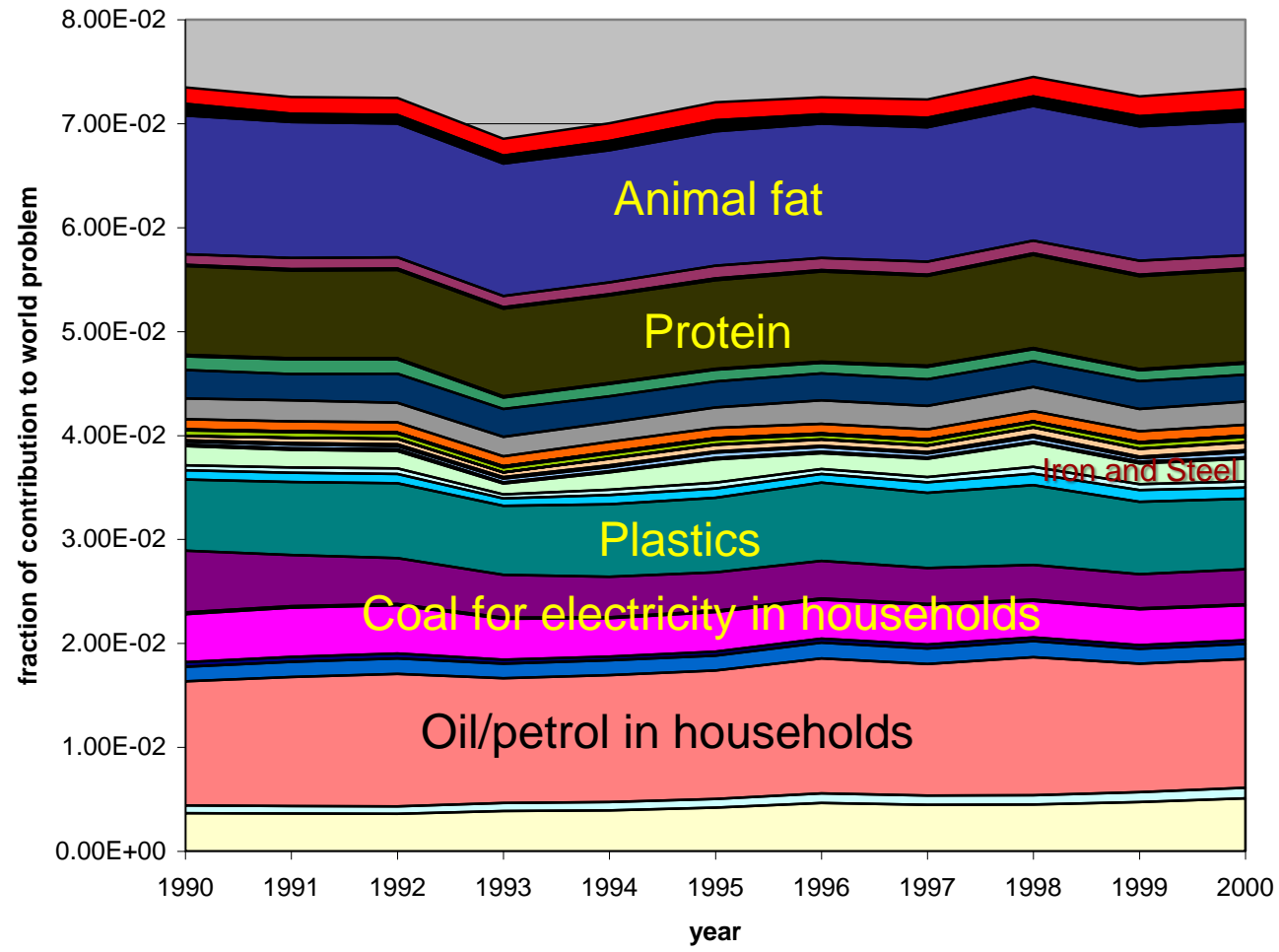
# Material consumption

## Industrialization



# Impact Assessment for Material Flows

EU15  
Normalised and weighted impact scores  
reference World2000, equal weighting set



- paper and board
- wood
- animal fats
- oil crops
- fish protein
- animal protein
- protein crops
- animal fibres
- fibre crops
- starchy crops
- sand and stone
- clay
- ceramics
- concrete
- salt
- glass
- zinc
- nickel
- lead
- iron and steel
- copper
- aluminium
- plastics
- brown coal for electricity in households
- brown coal for heating in households
- hard coal for electricity in households
- hard coal for heating in households
- oil for electricity in households
- oil for households
- natural gas for electricity in households
- gas for households

# Priority Categories of Products and Materials

- Housing
- Food
- Mobility in OECD countries
- Services in many developing countries
- Manufactured products in OECD

## EU:

- Animal Fats and Proteins
- Coal for Electricity
- Household petrol/oil consumption
- Plastics
- Metals (to a lesser degree)



International Panel  
for Sustainable  
Resource Management