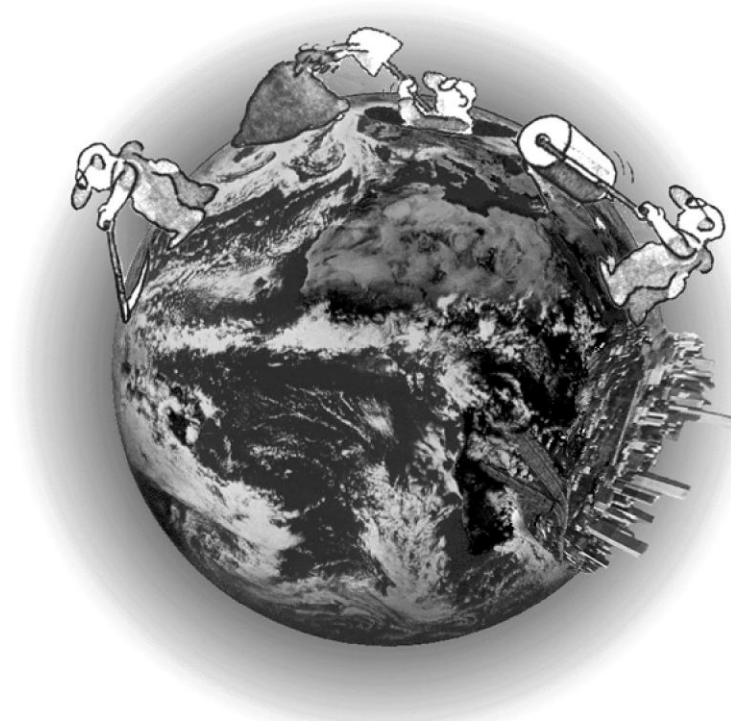


Resource Use

Harry Lehmann



Source: Harry Lehmann, 1994

The daily toll (partly)

75 million tons
of carbon dioxide
(CO₂) emitted

Every day
(worldwide)

50 000 hectares
of forests destroyed

350 000 tons
of fish caught

up to 100
species extinct

20 000 hectares
arable land
converted/deteriorated

System Earth



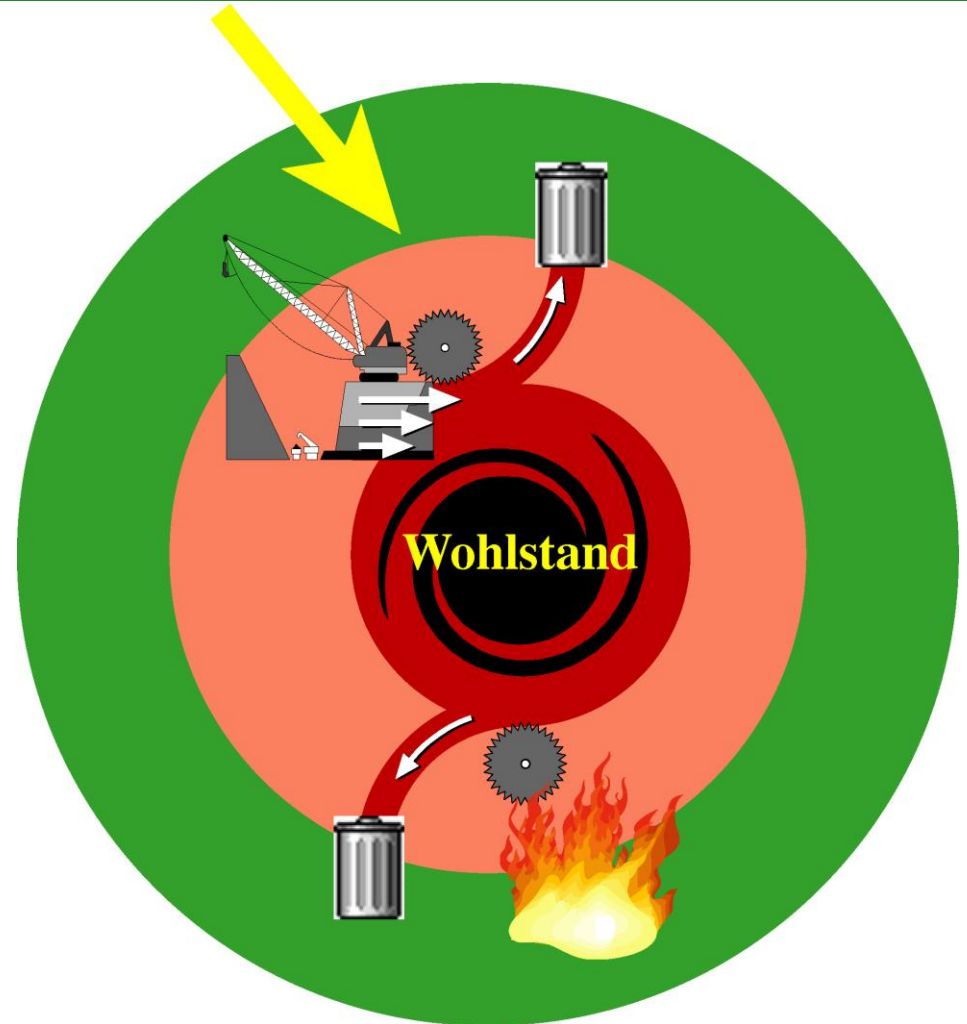
Lithosphäre (Boden)
Athmosphäre (Luft)
Hydrosphäre (Wasser)



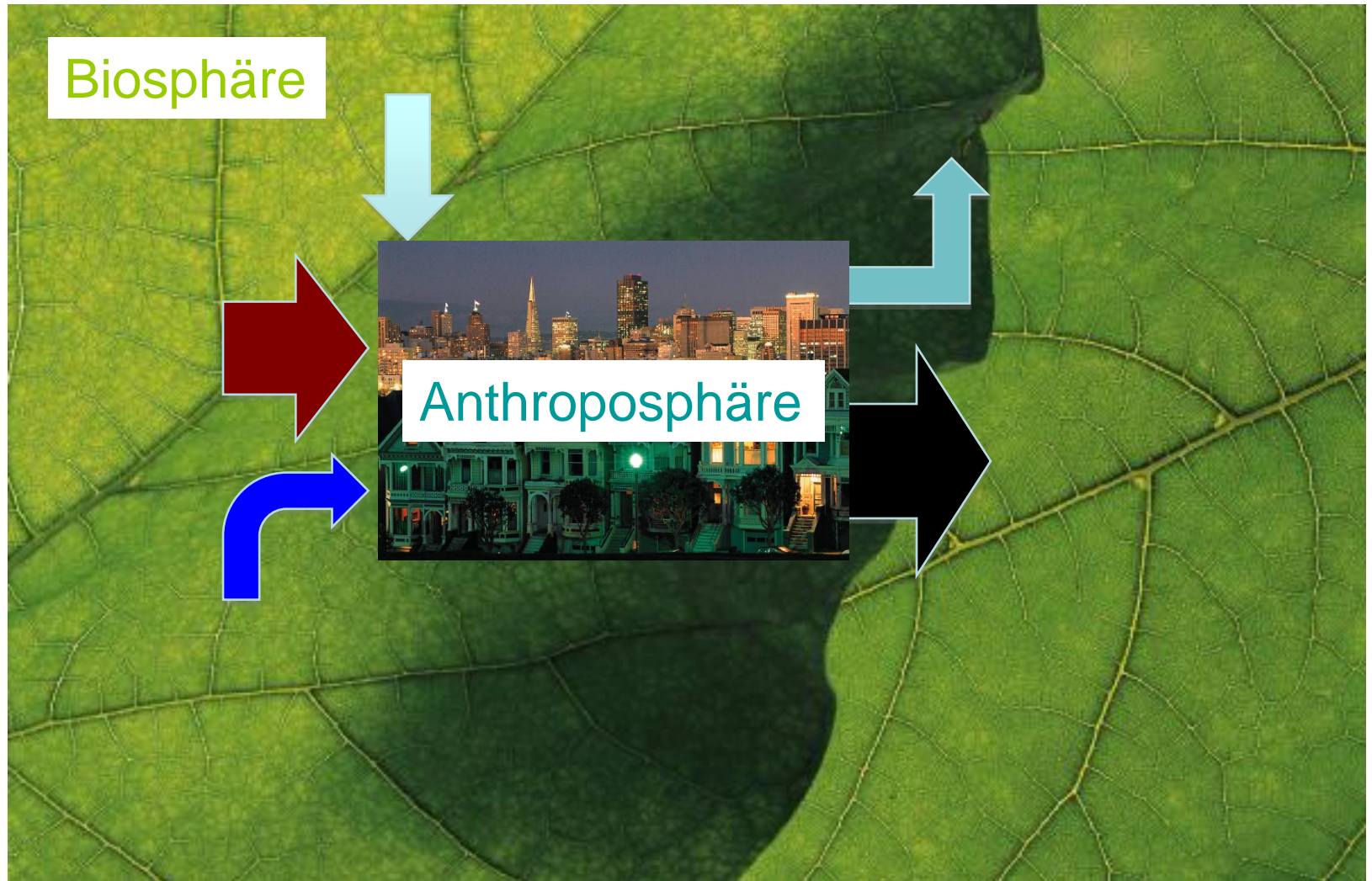
System Earth



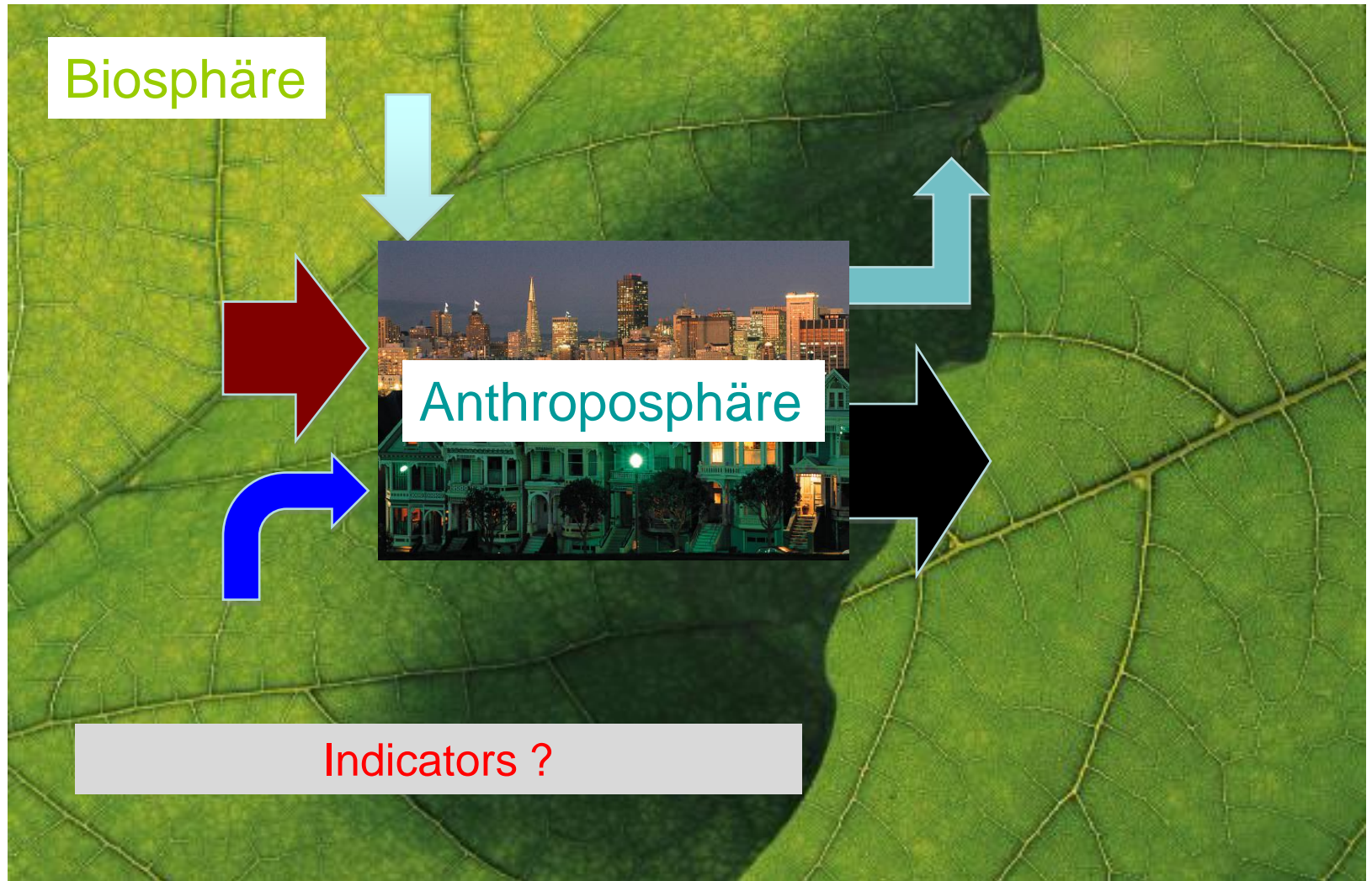
Lithosphäre (Boden)
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Hydrosphäre (Wasser)



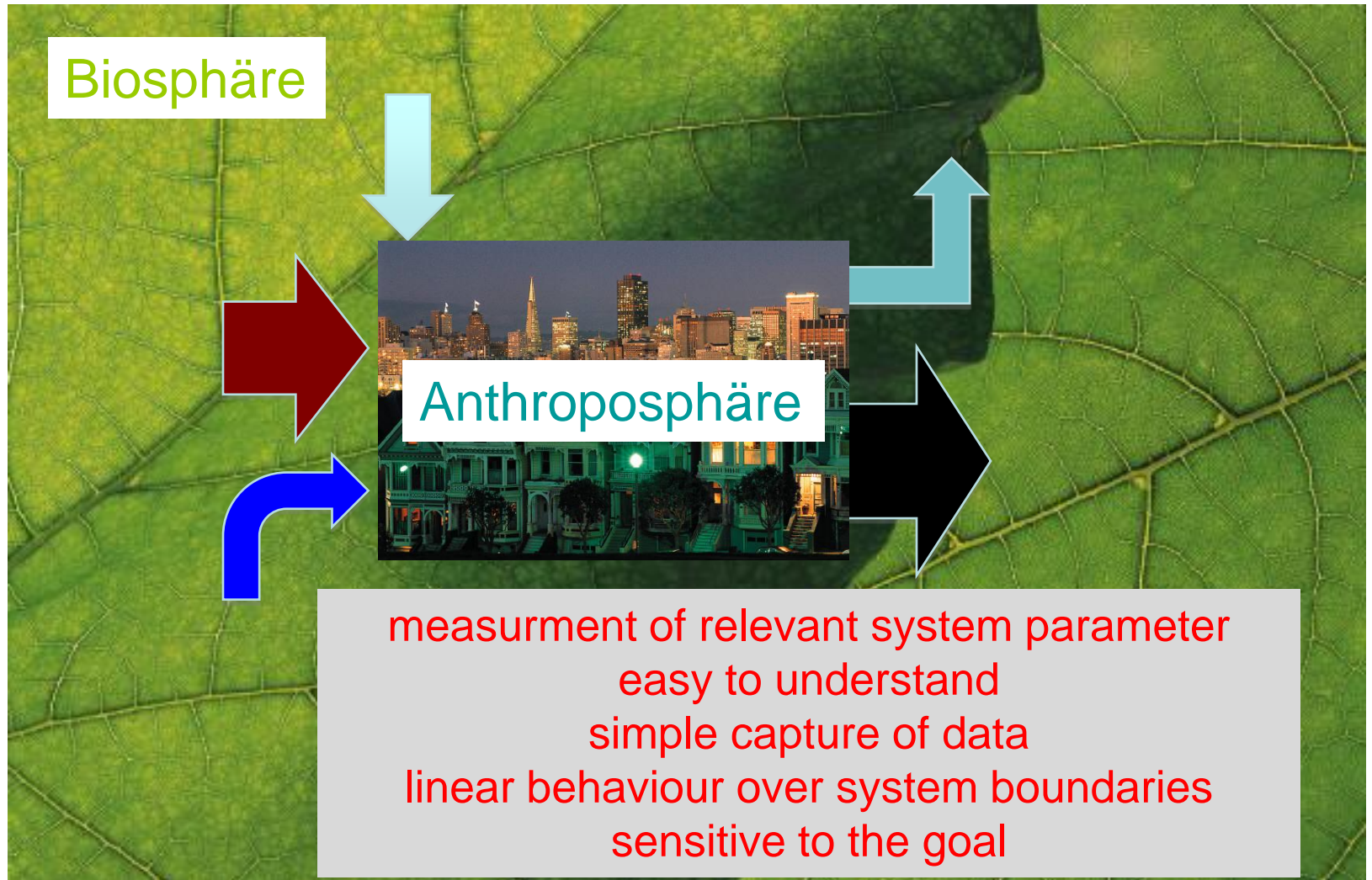
System Earth



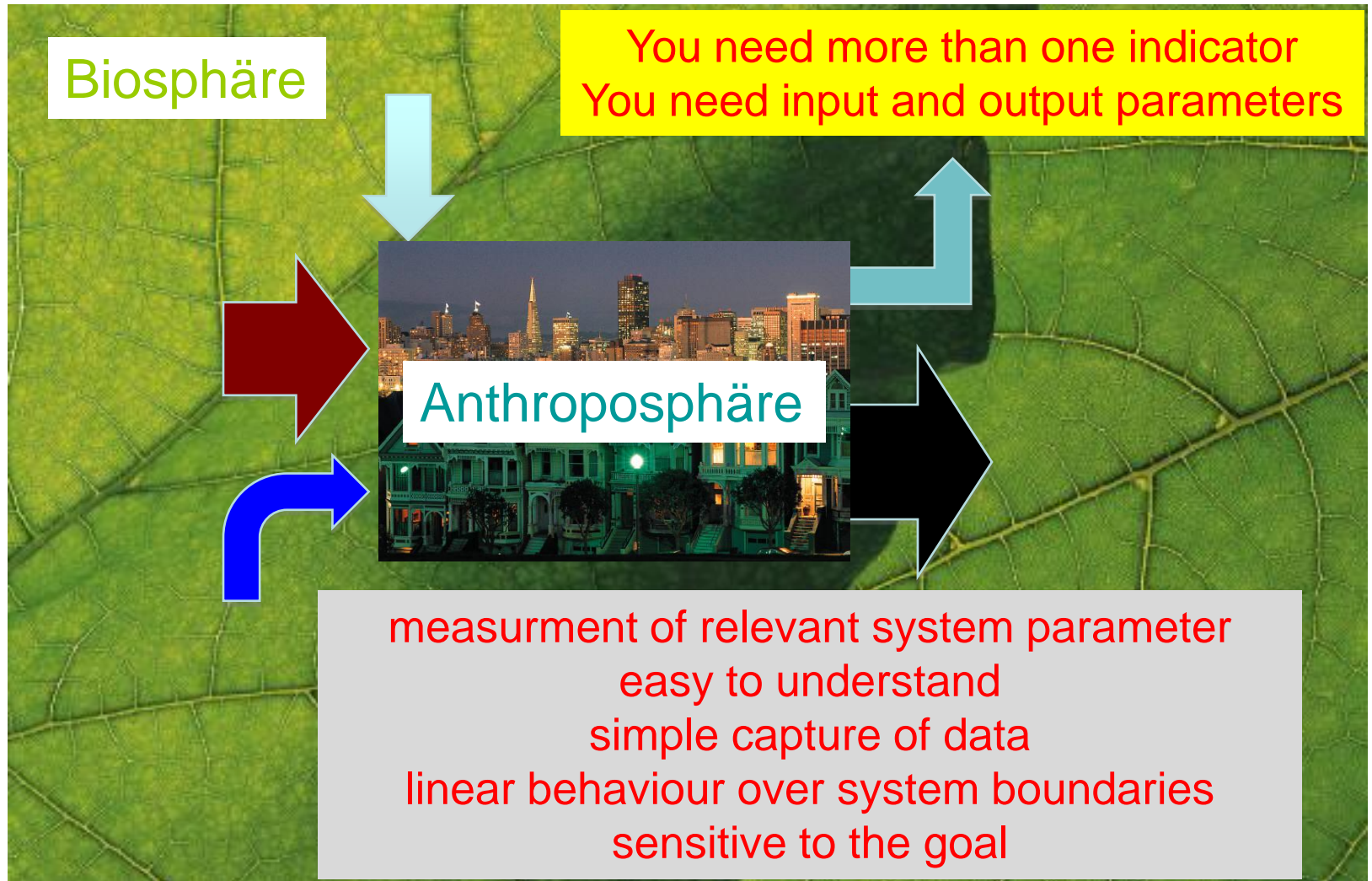
System Earth



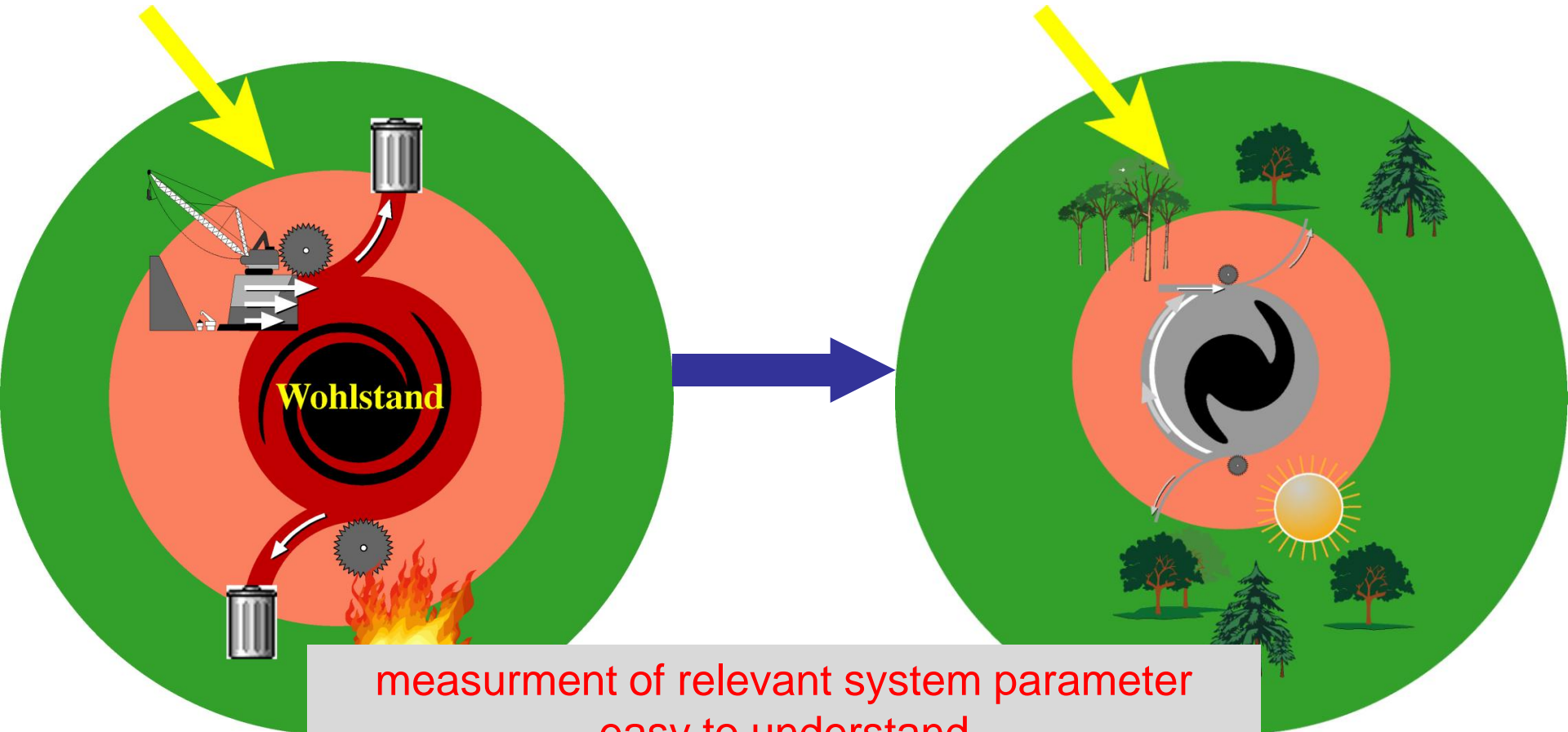
System Earth



System Earth

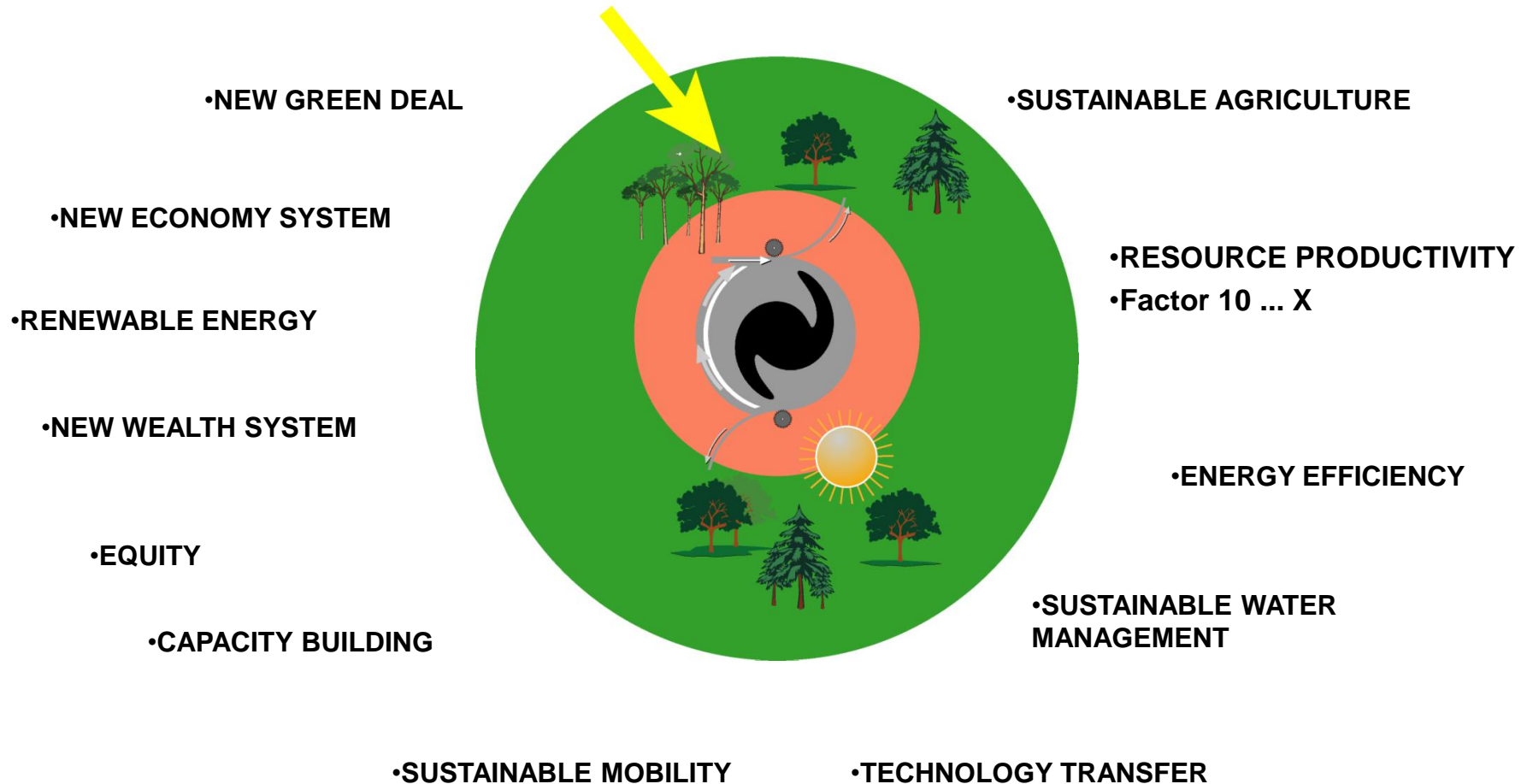


Goal : sustainable Human living on Earth



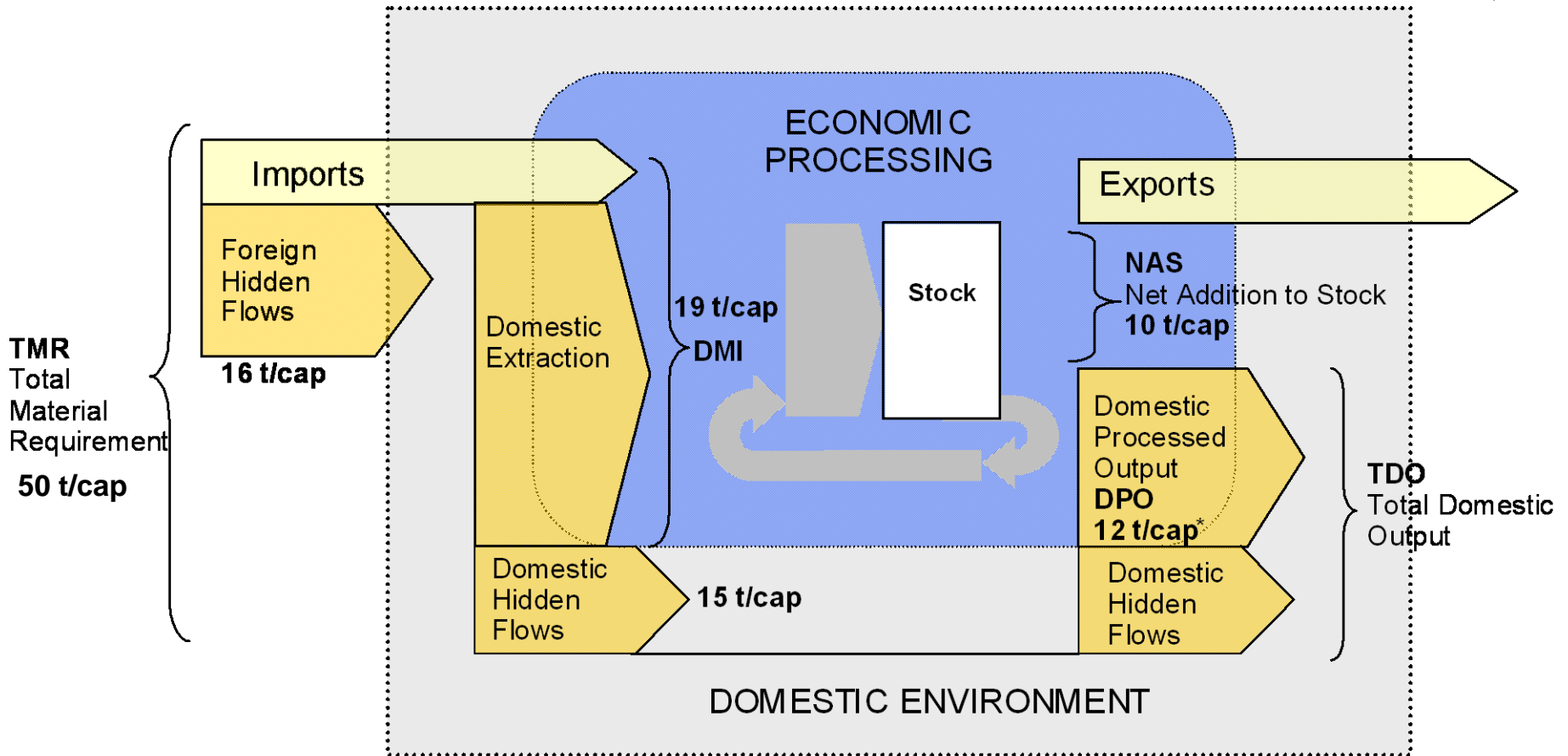
measurement of relevant system parameter
easy to understand
simple capture of data
linear behaviour over system boundaries
sensitive to the goal

Elements of a sustainable development



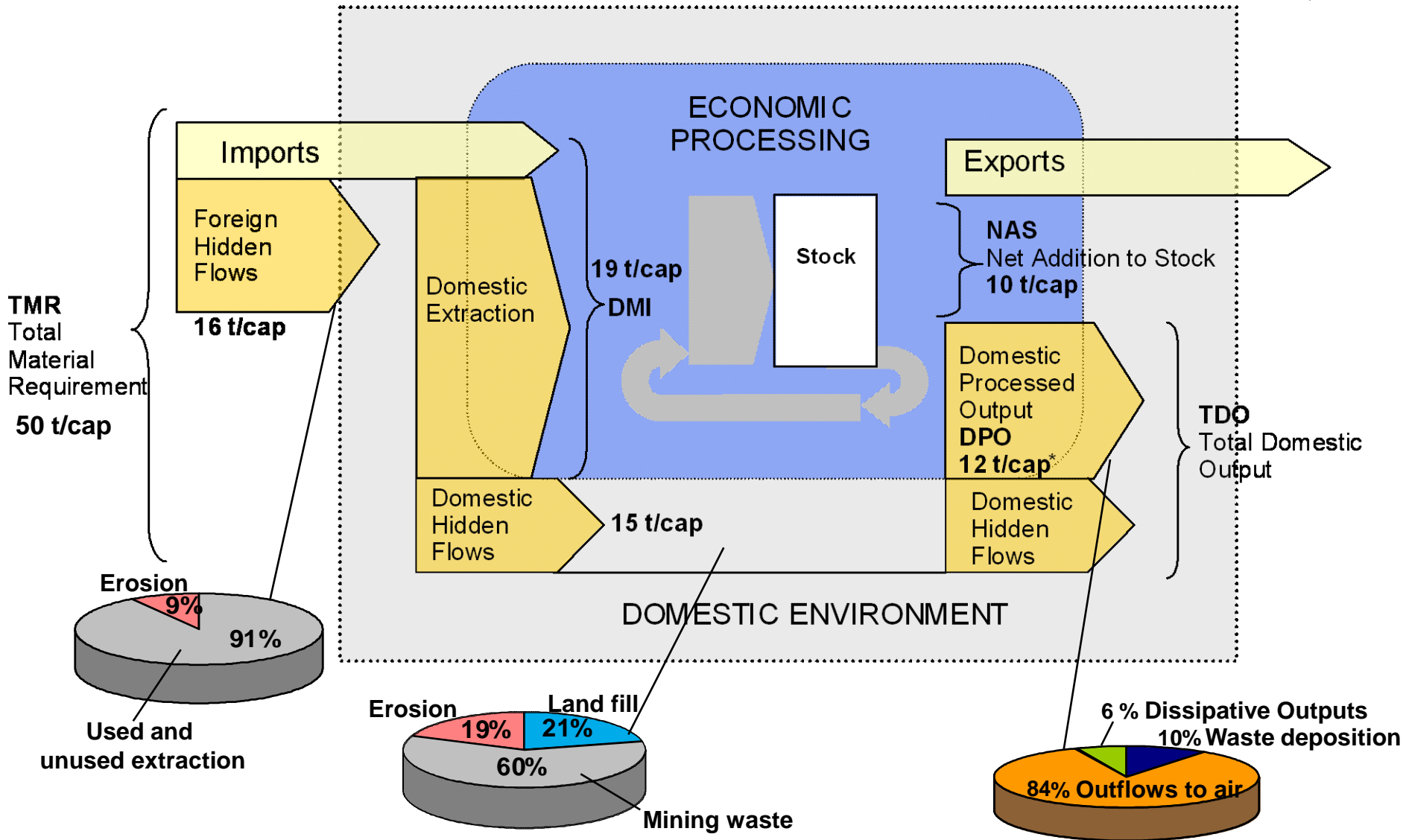
The socio-industrial metabolism with indicators for EU-15

1996*, 1997



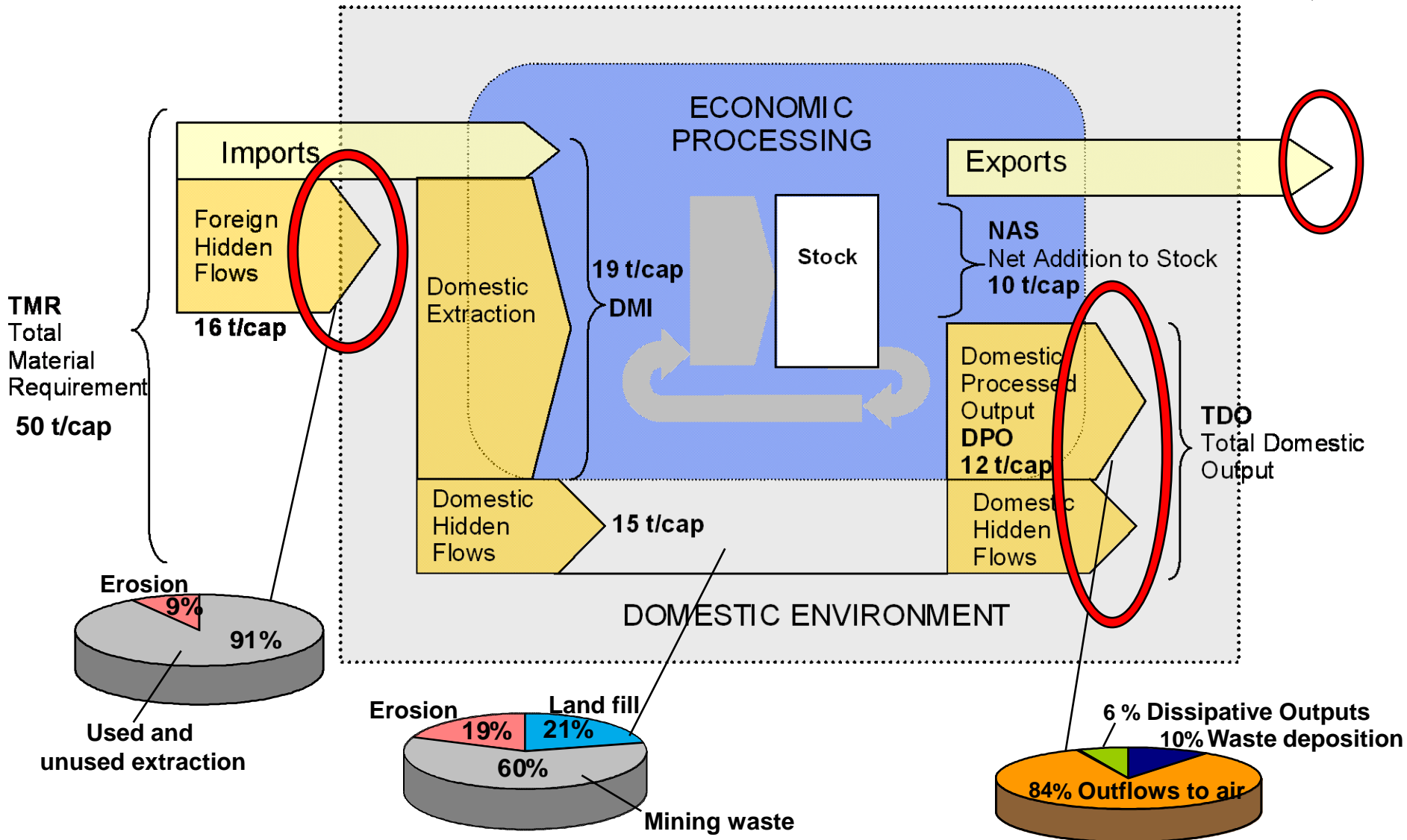
The socio-industrial metabolism with indicators for EU-15

1996*, 1997

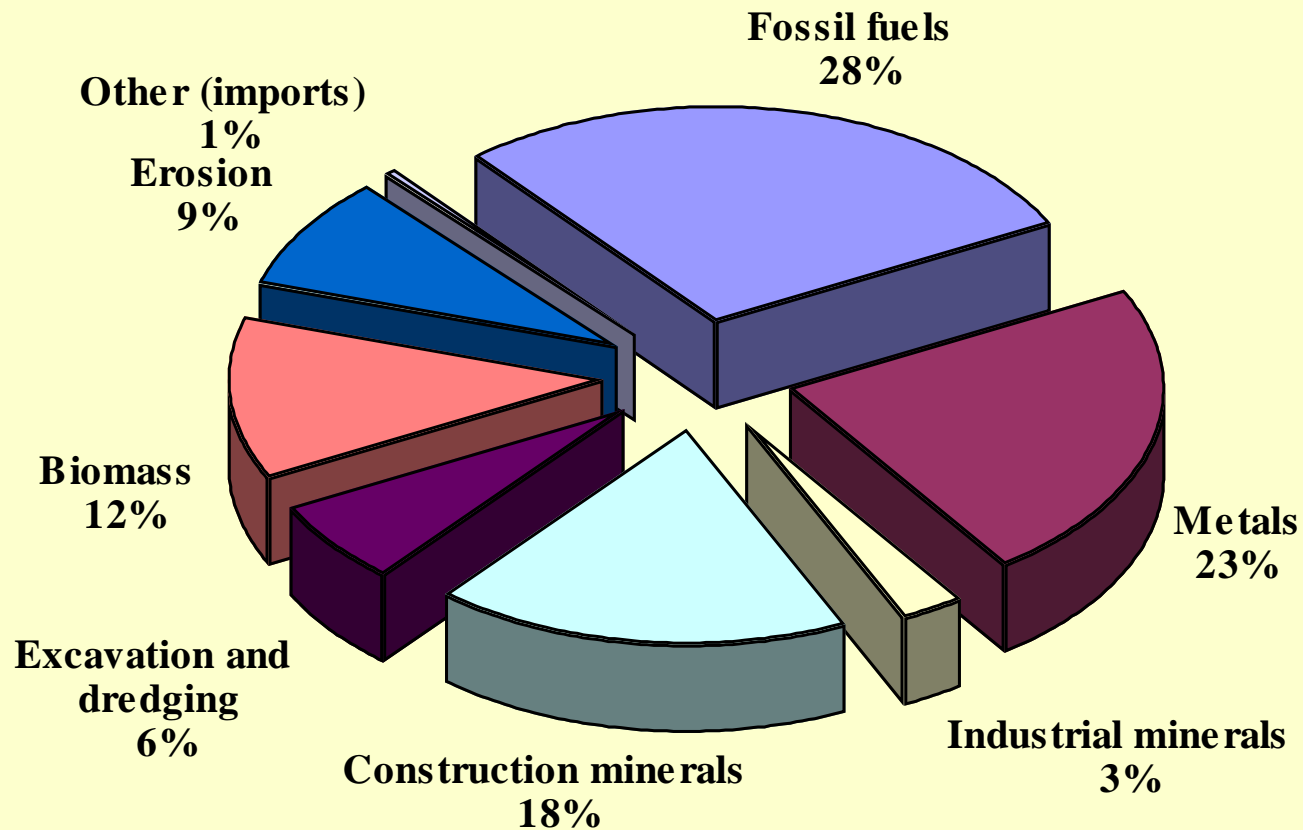


The socio-industrial metabolism with indicators for EU-15

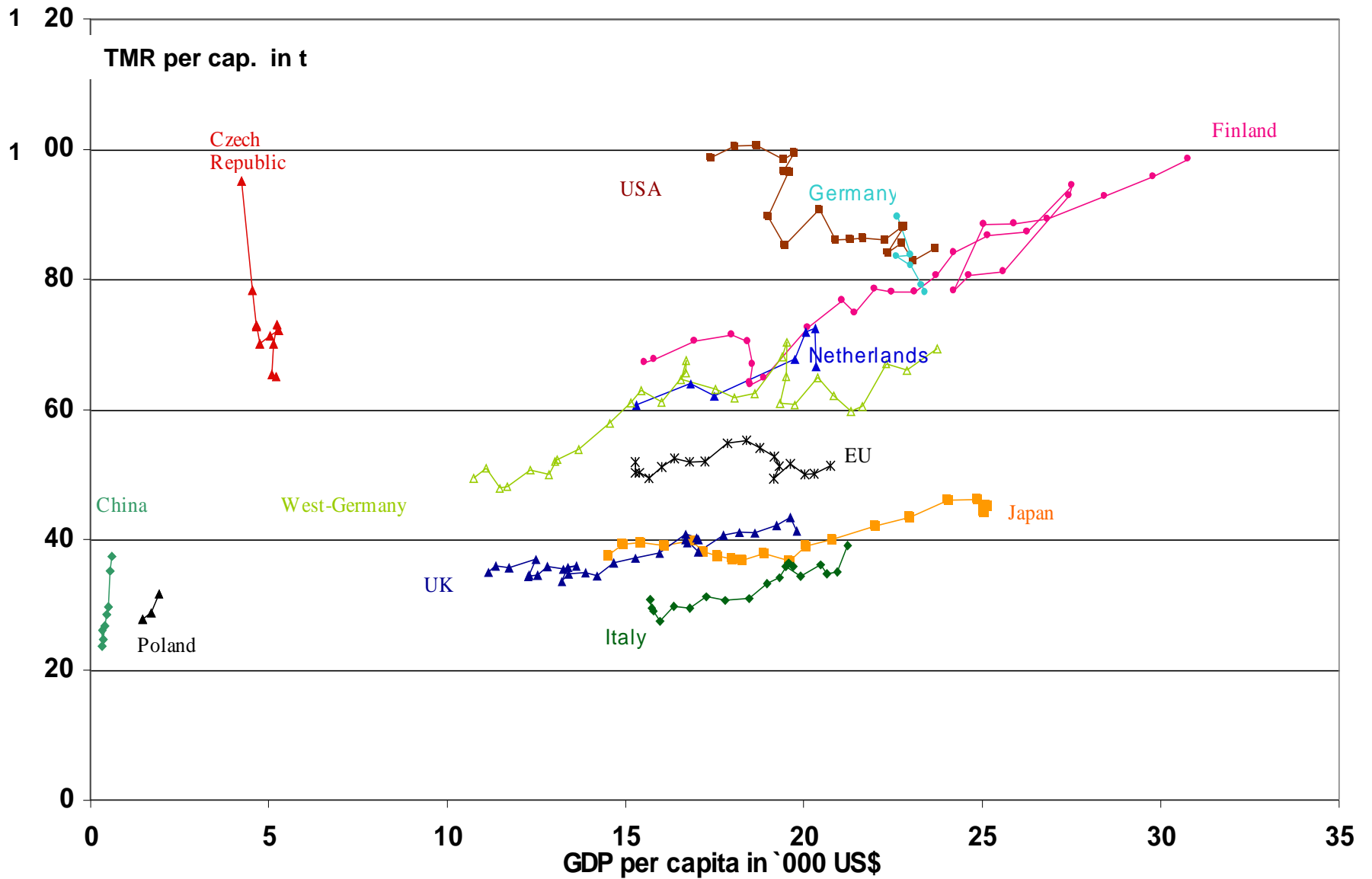
1996*, 1997



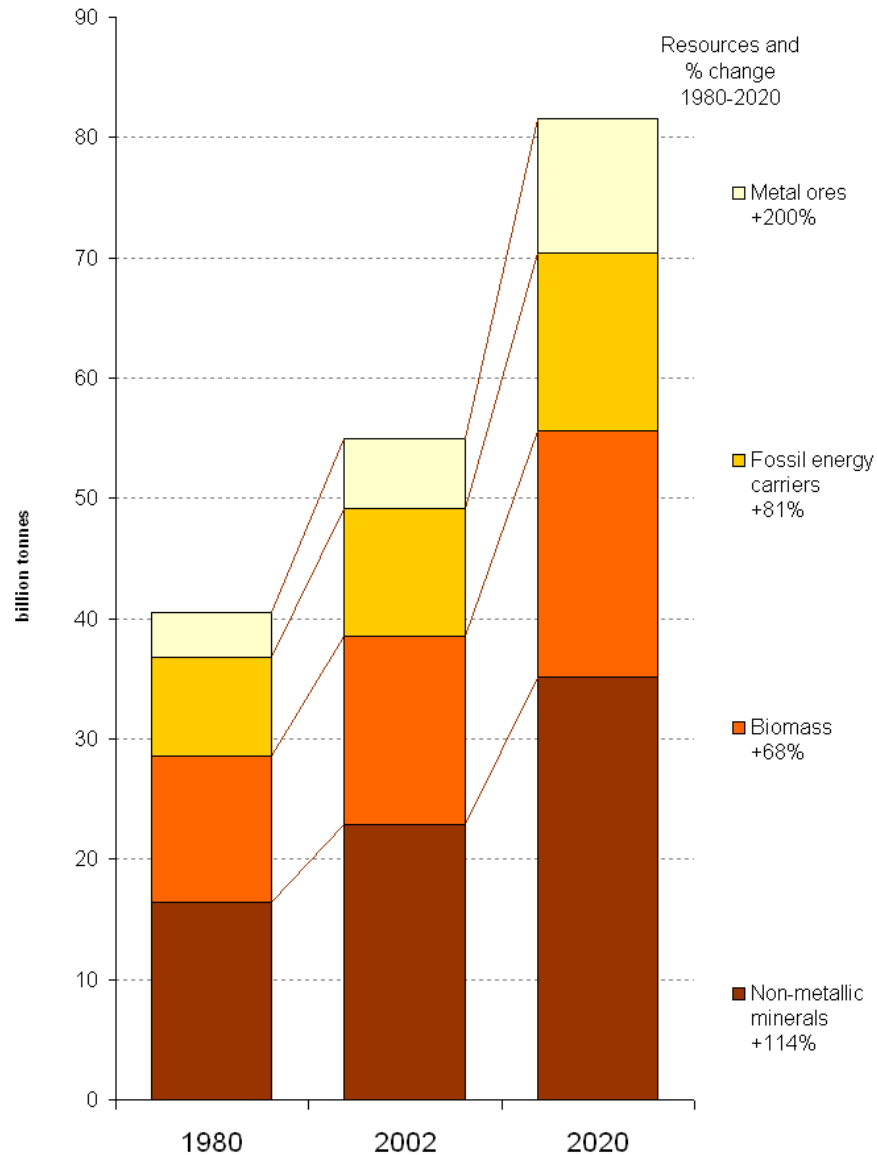
Composition of TMR (EU-15,1997)



TMR and economic growth



Global resources extraction and use



Resources consumption

- Today's per-capita consumption 22 kilograms per day on global average (DMC)
- Today's per-capita consumption 40 kilograms per day, if we include the unused extraction of materials, the „ecological rucksack“ (TMC)

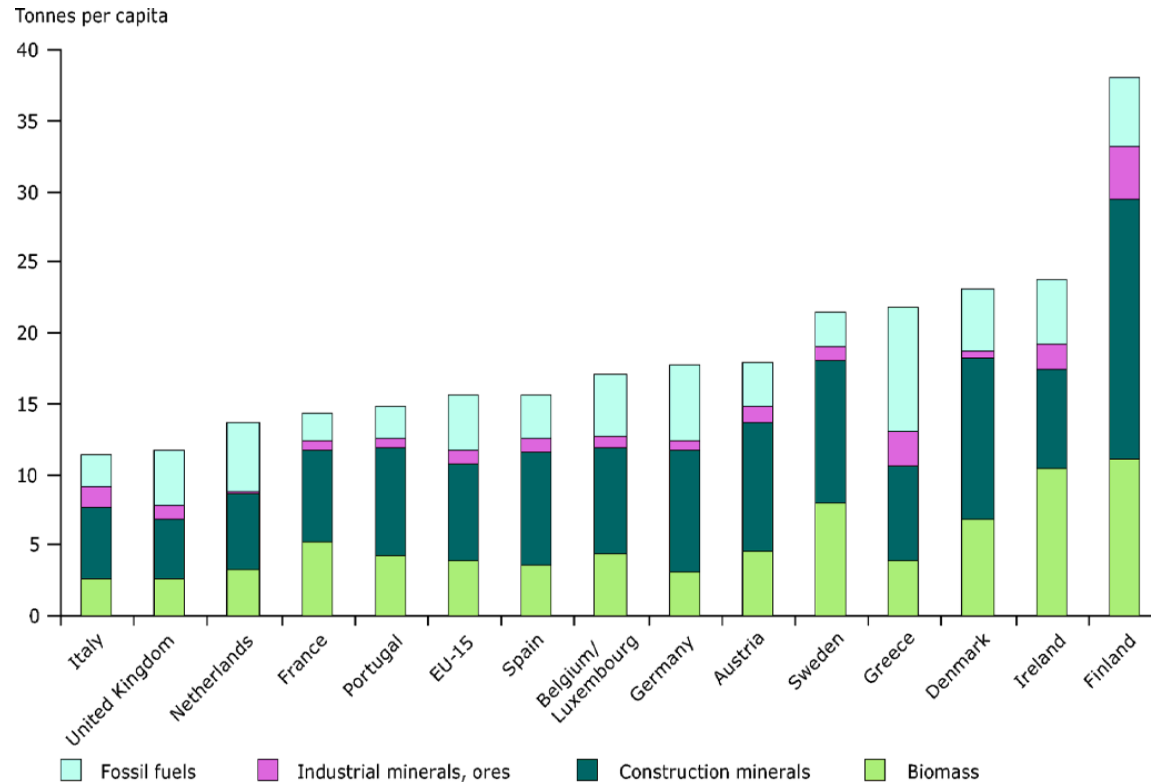
Drivers of increasing resource use

- Growing per-capita consumption especially in emerging economies
- Population growth
- Technological progress

(SERI 2008, OECD 2009)

Material flow-based indicator: DMC

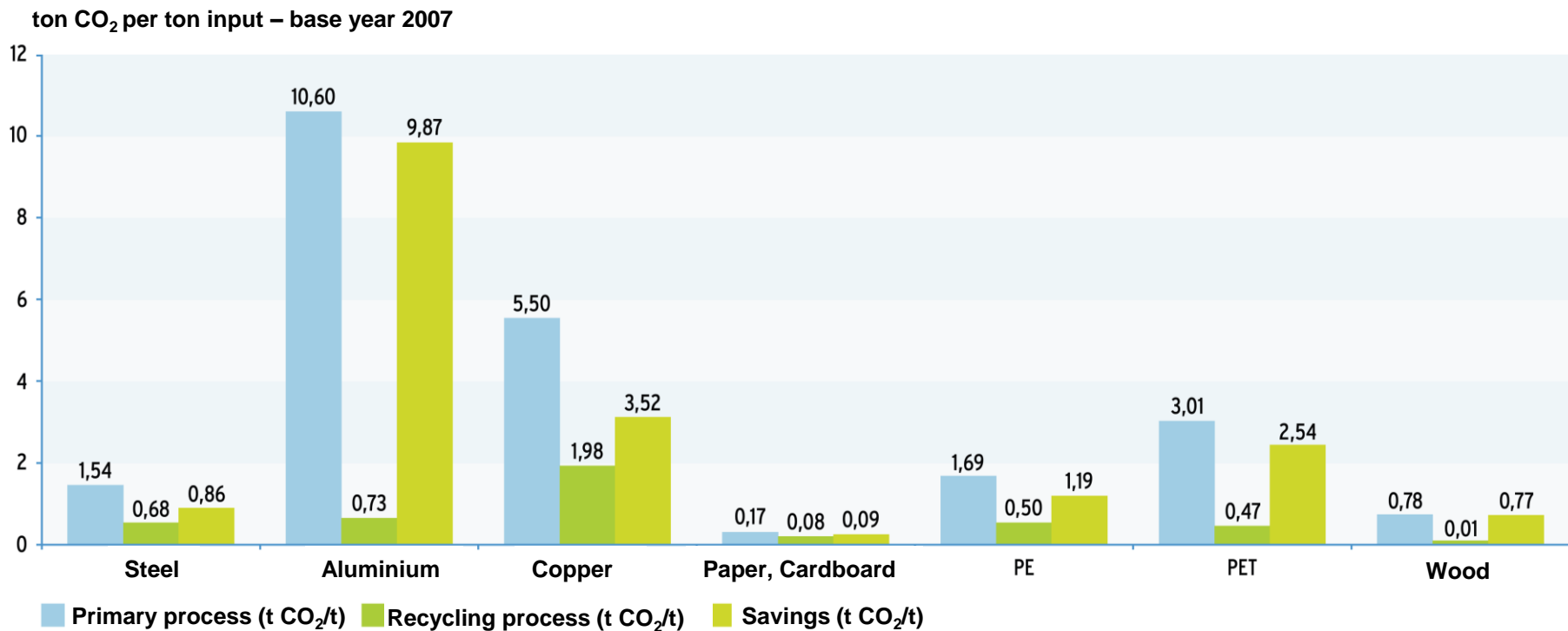
Common indicators on the economy-wide level also include consumption indicators, such as Domestic or Total Material Consumption (DMC or TMC)



Composition of aggregated resource use (DMC), EEA, 2001

Synergy between sustainable resource's use and climate protection

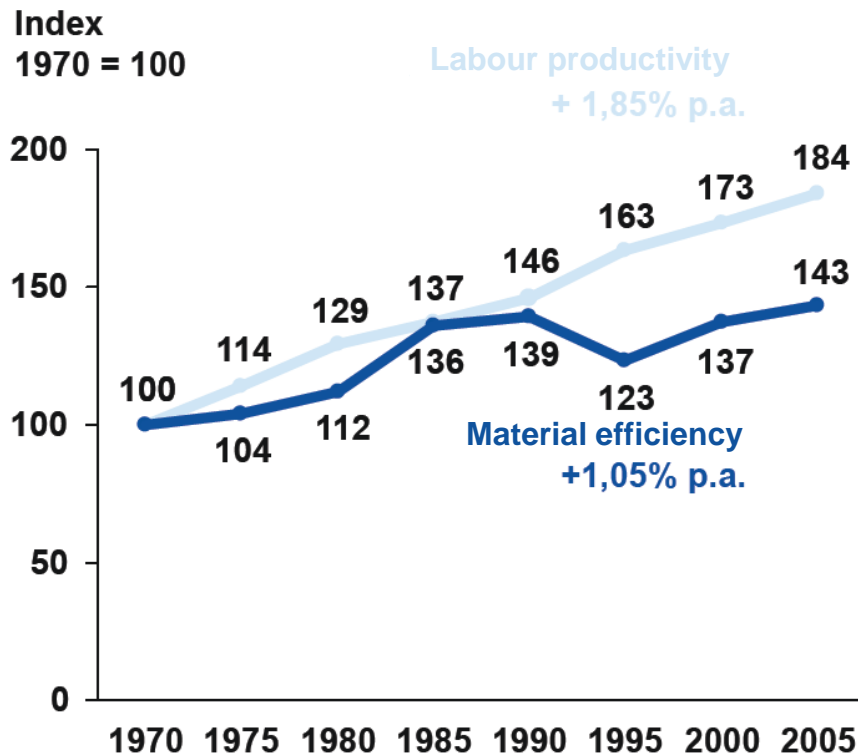
GHG savings per material from each material's recycling



(Fraunhofer 2008)

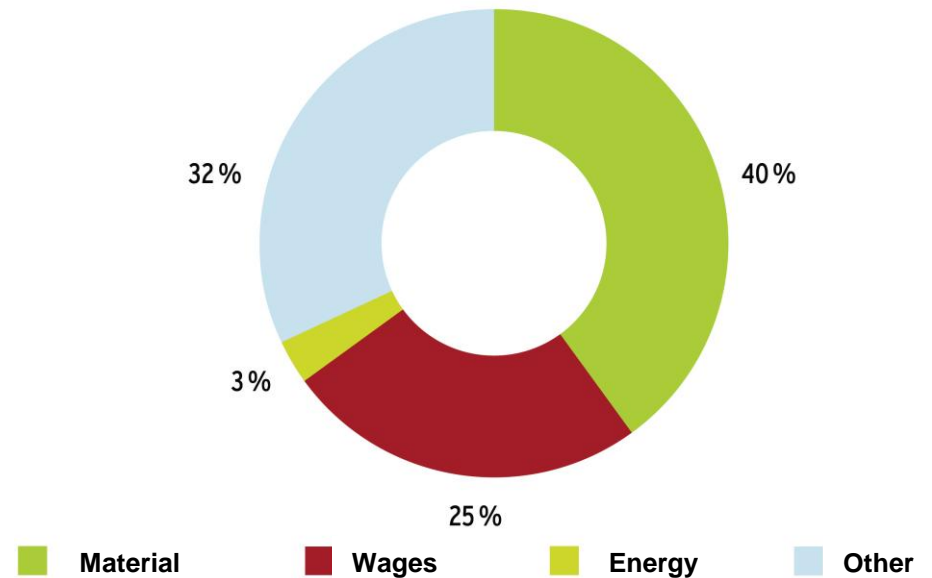
Increasing resource productivity

Historical development of material and labour productivity in Germany



(destatis, Wuppertal Institute, Roland Berger)

Factor cost in manufacturing industries



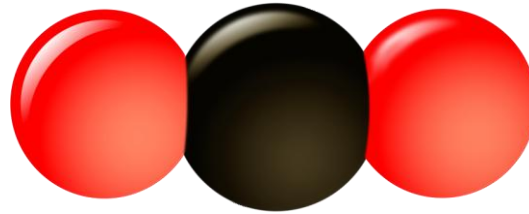
(BMU et al. 2006)

Elements of a global resource strategy

- Absolute decoupling of resource use from economic development,
- Introduction of effective policy measures to greatly enhance resource productivity as well as curbing demand over time,
- Seeking societal consensus on ecological and economic indicators,
- Seeking dialog with the business community to help redesign business models where revenues would be increasingly derived from quality of services rather than by selling material products,
- Initiating process to rethink lifestyles and help develop consumption patterns based on sufficiency and careful use of natural resources.

(WRF Declaration 2009)

Conclusio: Much more than carbon footprint



- Reduction on one environmental aspect in the product evaluation is not effective.
(UBA has a set of indicators – “umweltbezogener systemvergleich”)
- Informational instruments of environmental protection, e.g. voluntary eco-labeling of CO₂-saving products must be embedded in an overall consideration of the environmental impacts, or they may endanger the objectives of resource protection
- It must give relative and absolute information
- Example: Following a CO₂-label a part of paper from virgin pulp on the German copy paper market has lower CO₂ emissions than recycling paper.
- Example: Building construction elements (e.g. walls) can differ by a huge factor of resource use

Thank you for your attention!

harry.lehmann@uba.de