Decoupling

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Decoupling

The need for decoupling results from the need to decrease the environmental degradation, while keeping the economic growth.

Decoupling of "environmental pressure" from "economic growth" = breaking the link between "environmental bads" and "economic goods"

Decoupling represents a strategic approach for moving forward a global Green Economy – one that "results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities".

Achim Steiner, UN Under-Secretary General and Executive Director, UNEP

…decoupling means using less resources per unit of economic output and reducing the environmental impact of any resources that are used or economic activities that are undertaken…

UNEP 2011 Decoupling Natural Resource Use and Environmental Impacts from Economic Growth

- Relative decoupling – environmental pressure is rising but at a slower pace than welfare
- Absolute decoupling – environmental pressure is decreasing while welfare is increasing

In most cases changes in the absolute levels of environmental pressures are of fundamental importance.

Indicators

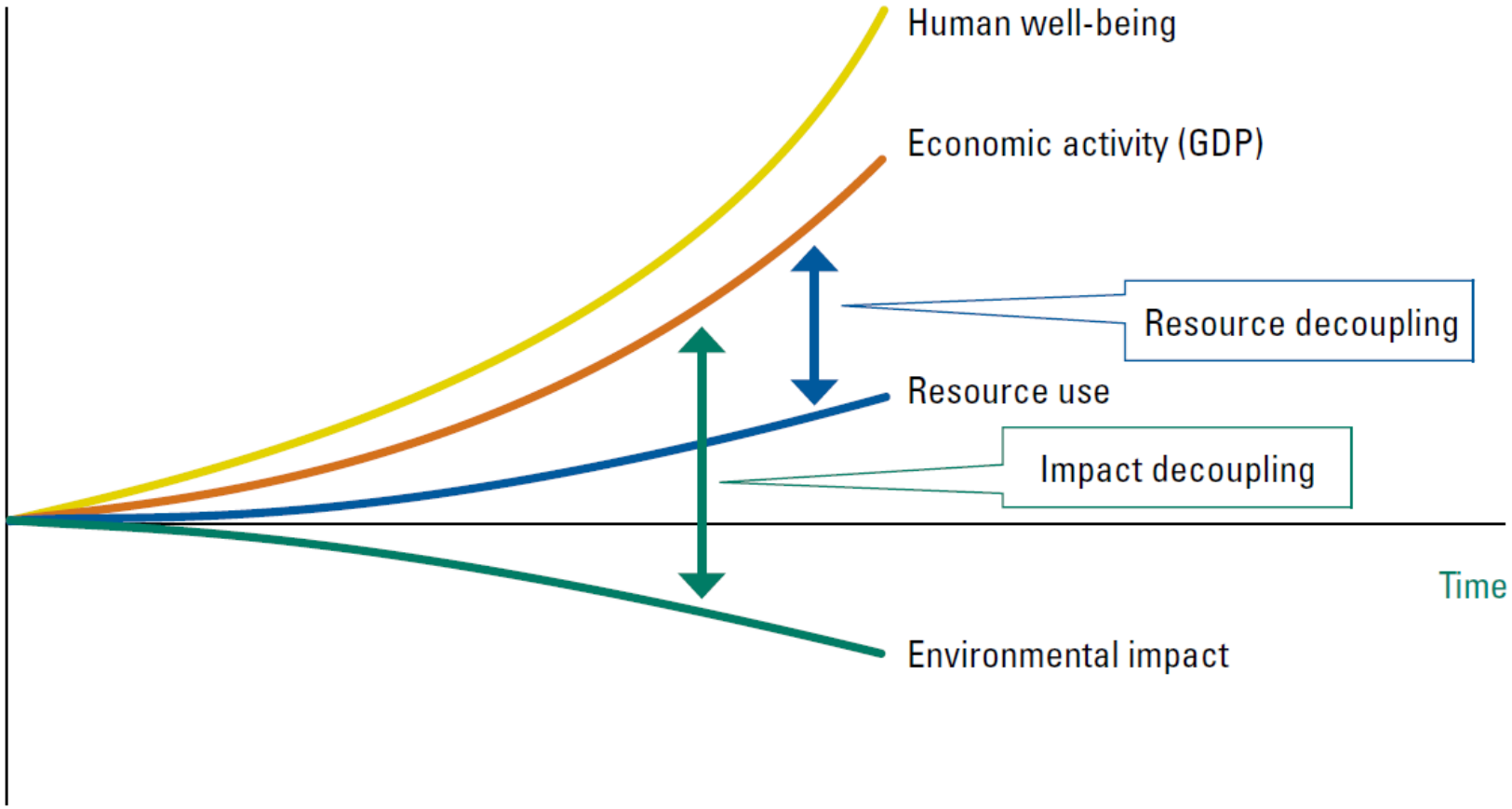
- Crucial for assessment of decoupling
- Based on the DPSIR framework, from the first two areas: driving forces and pressures (OECD definition)
- Questions
  - How well is the indicator linked to environmental degradation or human well-being?
  - Does it cover shifts of environmental burden across countries, impact areas?

Which environmental indicator?

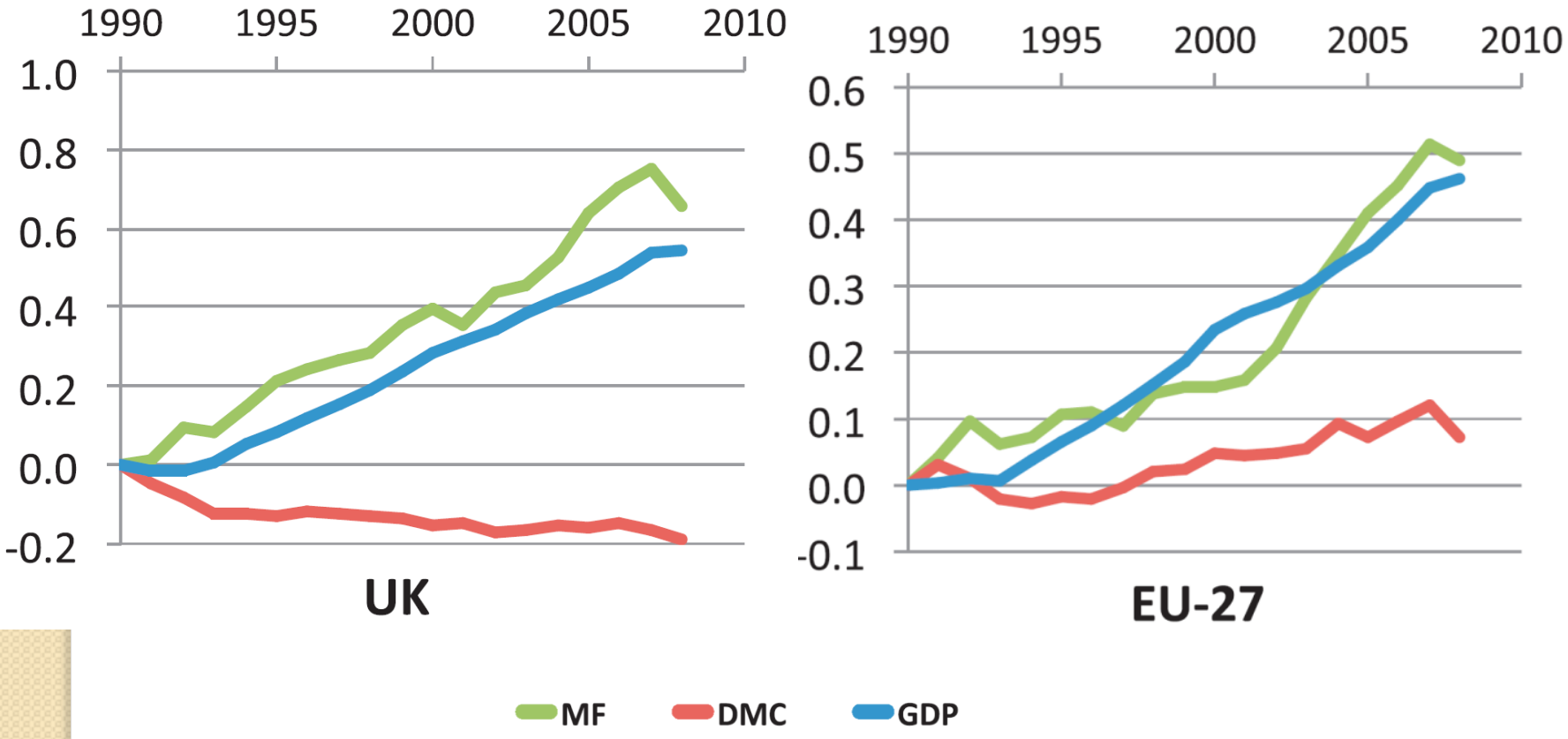
- DMC?
- CO2 emissions?
- NOx emissions?
- Carbon footprint?
- Land footprint?
- Water footprint?
- Material footprint?

- There is no single environmental indicator to assess the total environmental burden.
- One indicator is not enough!

Concept of double decoupling

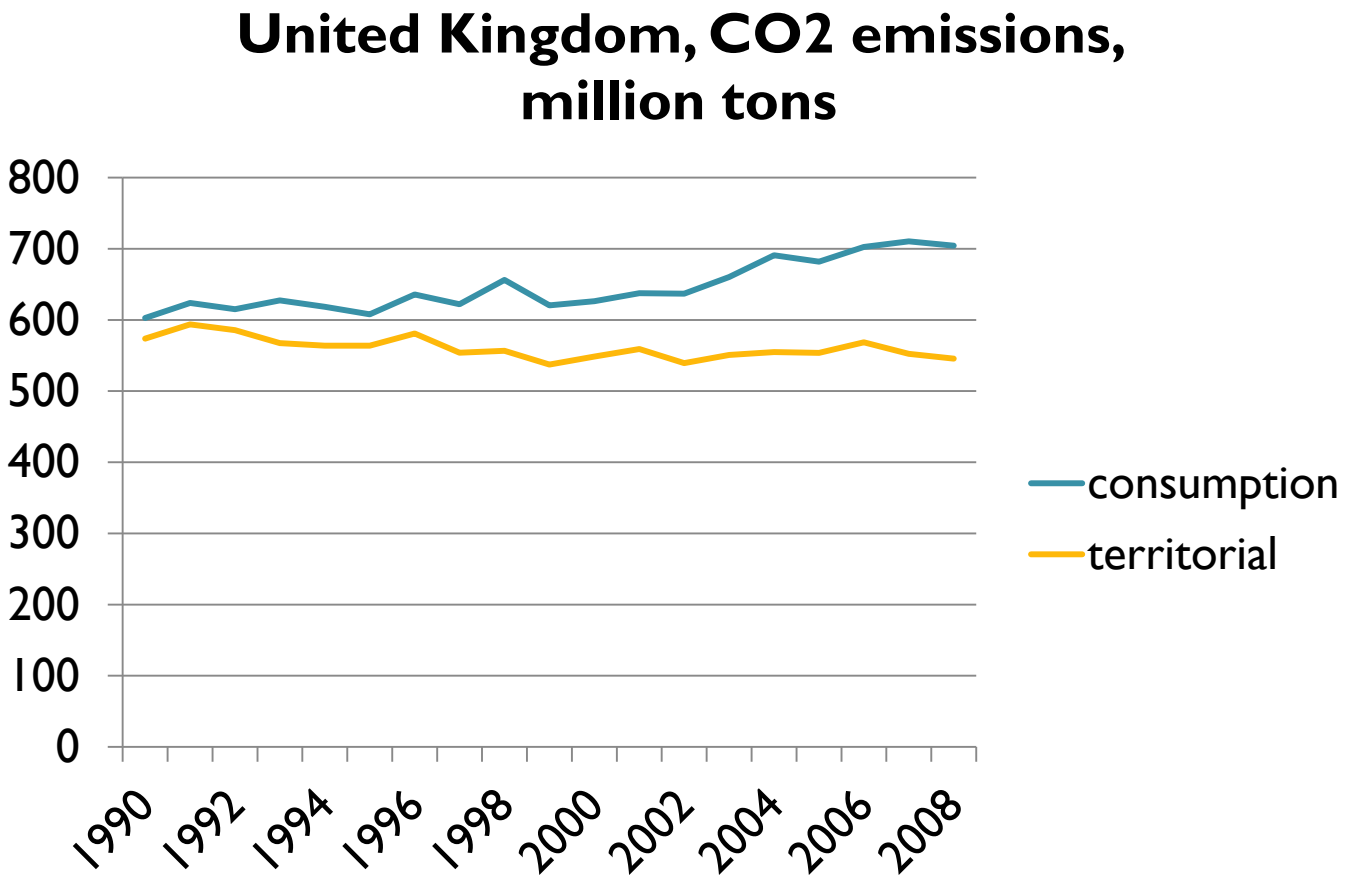


Case studies: Decouping of material use



Source: Wiedmann et al. in press

Case studies: CO2 emissions



Source: Peters et al. 2011

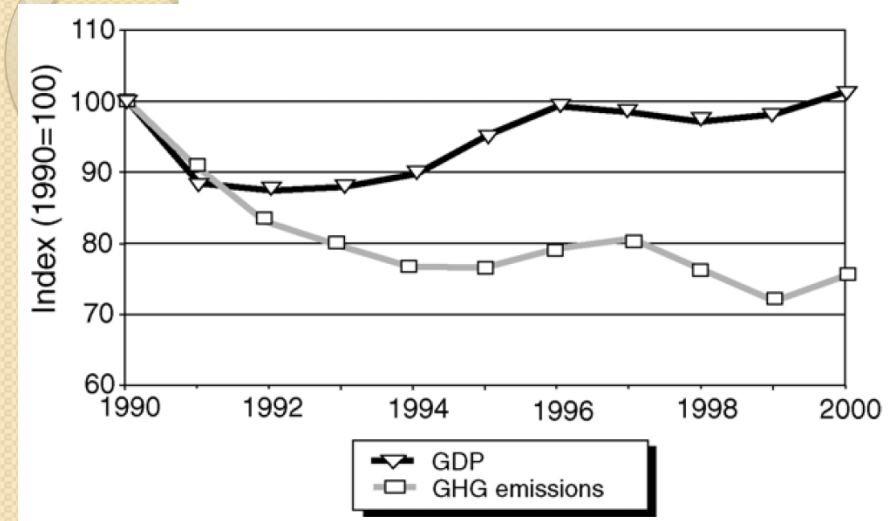
Decoupling on a sector level

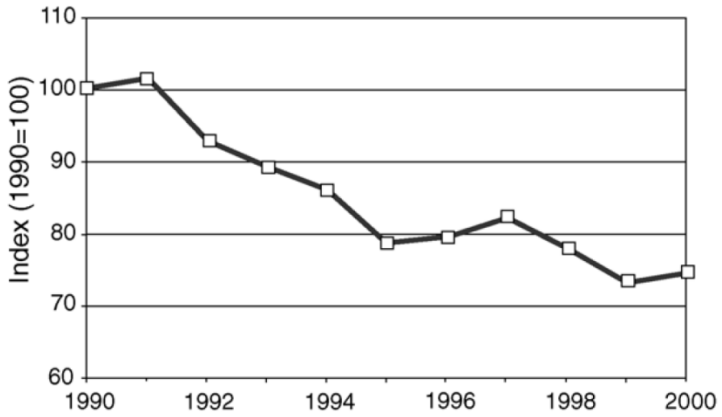
- What can be compared on a sector level?
  - „Positive“ indicator: Value added, employment, employment footprint, total economic output
  - „Negative“ indicator: direct environmental pressure, environmental footprint
- Best choice
  - Total economic output x total footprint of the sector?
  - Total employment footprint x total environmental footprint?

Input-output analysis for decoupling

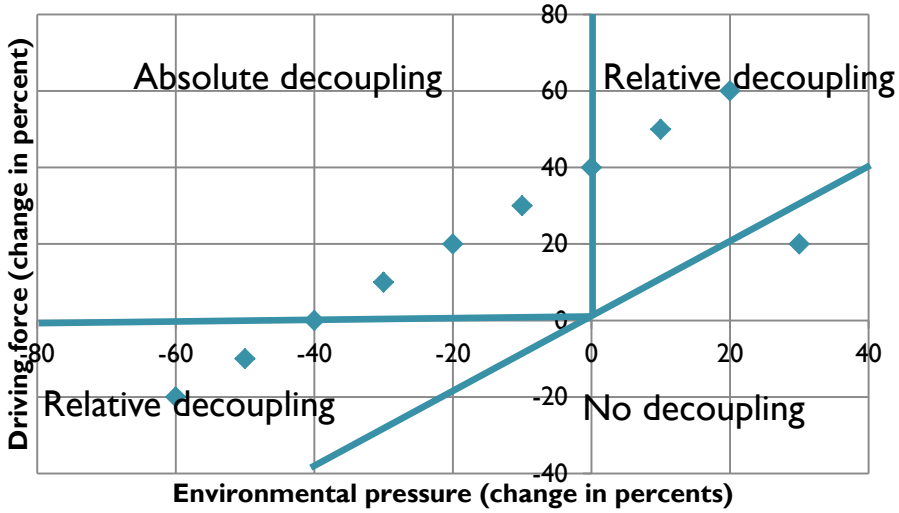
- Possibility to study decoupling on national and sector level
- Possibility to include upstream flows
- Possibility to assess the role of changes for the total decoupling

Decoupling presentation





GHG/GDP



Decoupling factor

$$decoupling\ \ factor = 1 - \frac{\frac{EP_{end}}{DF_{end}}}{\frac{EP_{start}}{DF_{start}}}$$

Decoupling ocures when decoupling factor is between 0 and 1.

Impossible to distinguish absolute and relative decoupling.

References

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