

# Characterization of the development of European industry based on disaggregated indicators for different environmental impacts, exemplarily for Germany

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## Introduction

In the current international political debate how to achieve sustainable development OECD for example, as well as the UNESCAP, have identified decoupling of environmental use from economic activities as one of the most important objectives for the first decade of the 21st century. Generally decoupling means breaking the link between "environmental bad" and "economic goods". Appropriate indicators are a necessity to assess the ways to achieve decoupling. In the context of decoupling, an indicator should consider a meaningful link between economic activity and environmental impacts of economic activities. Although the aim of decoupling has to be reached on a macroeconomic scale, to map the driving forces (and the trailing one) of decoupling a more sophisticated information base is necessary, i.e. the indicator should capture on the one hand the activities of industries. On the other hand the chosen indicator should allow to plot the whole economy comprehensively. Additionally, the underlying data should be publicly available and regularly updated. This poster show a decoupling indicator exemplarily for Germany on the level of industrial classes. The presented indicator – environmental impact, in Eco-Indicator points, per turnover, in Euro, of an industrial class – make use of the emission data base European Pollutant Emission Register (EPER) in combination with the life cycle impact assessment method Eco-Indicator 99.

## Decoupling Indicator

-> of industry class  $i$ :

$$\Delta e_{i,t} = \frac{E_{i,t}}{V_{i,t}} - \frac{E_{i,t-1}}{V_{i,t-1}},$$

-> of industry class  $i$ , regarding the impact category  $ic$ :

$$\Delta e_{i,t}^{ic} = \frac{E_{i,t}^{ic}}{V_{i,t}} - \frac{E_{i,t-1}^{ic}}{V_{i,t-1}}$$

for each industry class  $i$  and period  $t$  is:

$\Delta e$  = decoupling indicator

$E$  = environmental impact

$V$  = economic performance

$e^{ic}$  = decoupling indicator regarding the impact category  $ic$

$E^{ic}$  = environmental impact regarding the impact category  $ic$

## Data Source – environmental performance

- reference parameter: emissions of industry classes, valued by Eco-Indicator points
- data base: European Pollutant Emission Register (EPER)
  - Implementation under the IPPC Directive of the European Union
  - EPER registers 37 emissions to air, 26 emissions to water, e.g. - CO<sub>2</sub>, NH<sub>3</sub>, dioxins, metals and compounds
  - compulsory reporting by companies:
    - for categories of industrial activities (ANNEX I, IPPC Directive)
    - if threshold values of emissions are exceeded

However:  
EPER is discontinued -> new: PRTR

- more pollutants
- more industrial sectors
- annual reporting
- pollutants in water, air and soil

## Data Source – economic performance

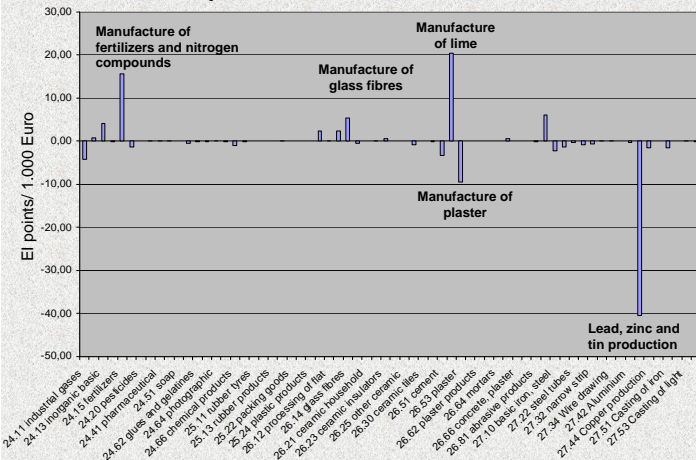
- reference parameter: turnover of industry classes
  - + only consistent data source available
  - bias due to incorporating of intermediate goods into the calculation
- data base: statistics on sales tax

## Eco-indicator 99

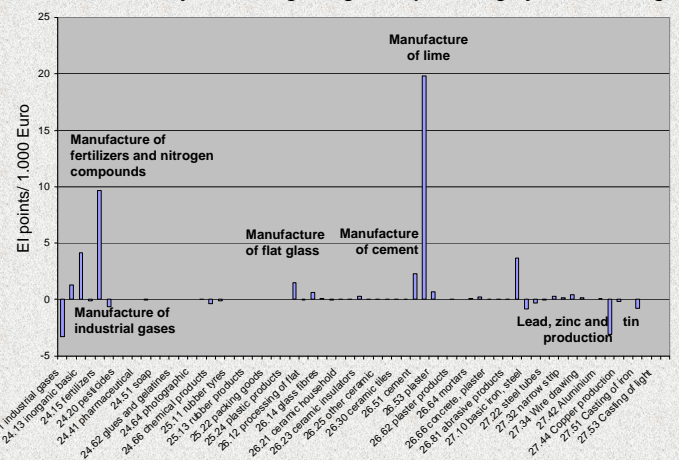
- method for the determination of the potential environmental impacts
- analysis of the damages on human health, ecosystem quality, resources
- aggregation of the results by means of normalisation and weighting to Eco-Indicator points (EI points)

## Results: decoupling indicators of industry classes in Germany - comparison of 2004 and 2001

Indicator of industry classes



Indicator of industry classes regarding the impact category climate change



## Conclusions

- The used method allows not only to give an overall picture of an industrial class but also to differ along different impact categories, e.g. climate change.
- The development in an impact category could differ from the one of aggregated environmental impacts, e.g. lead, zinc and tin production.
- The indicator captures the activities of disaggregated industries and also plots the whole economy comprehensively.
- A possible decoupling of industry classes in an economy can be shown by the development and change of the industry classes in a time period.
- Due to data constraints in a first approximation, the results for just two years are shown. Since in the future the data sources will be updated annually, the indicator could be used for an analogous time period.