

Sustainable Economics

North Sea Sustainable Energy Planning
Think Tank Meeting
Worpswede, 29.06.2011

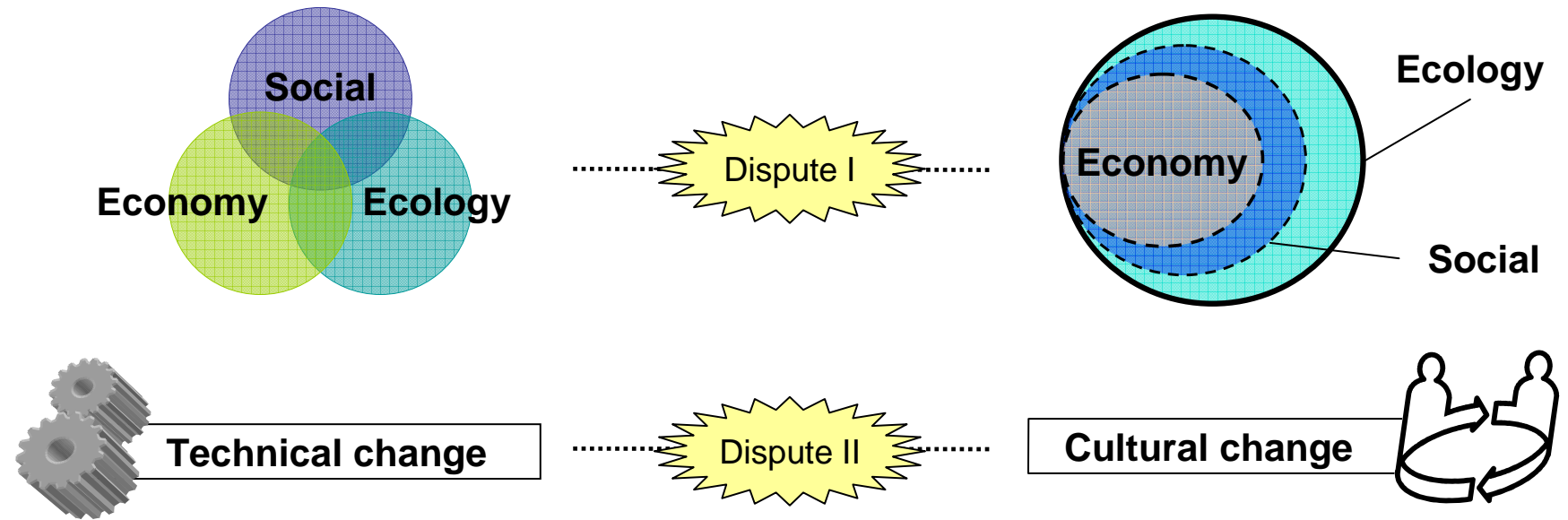
Niko Paech

Sustainability: Origins and State of the Discussion

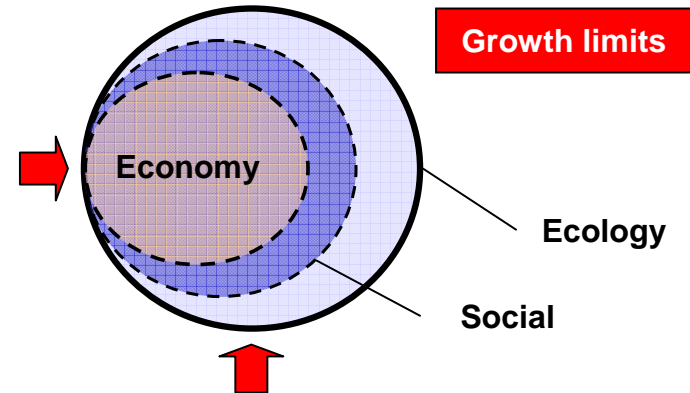
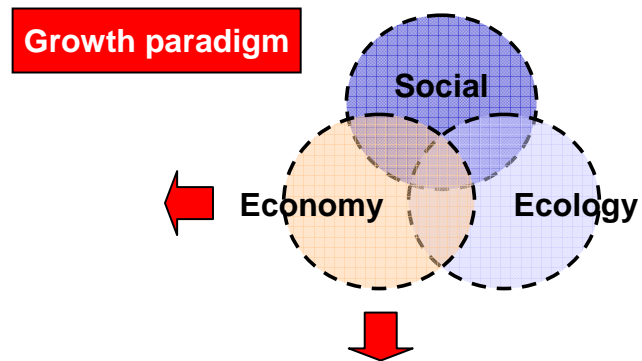
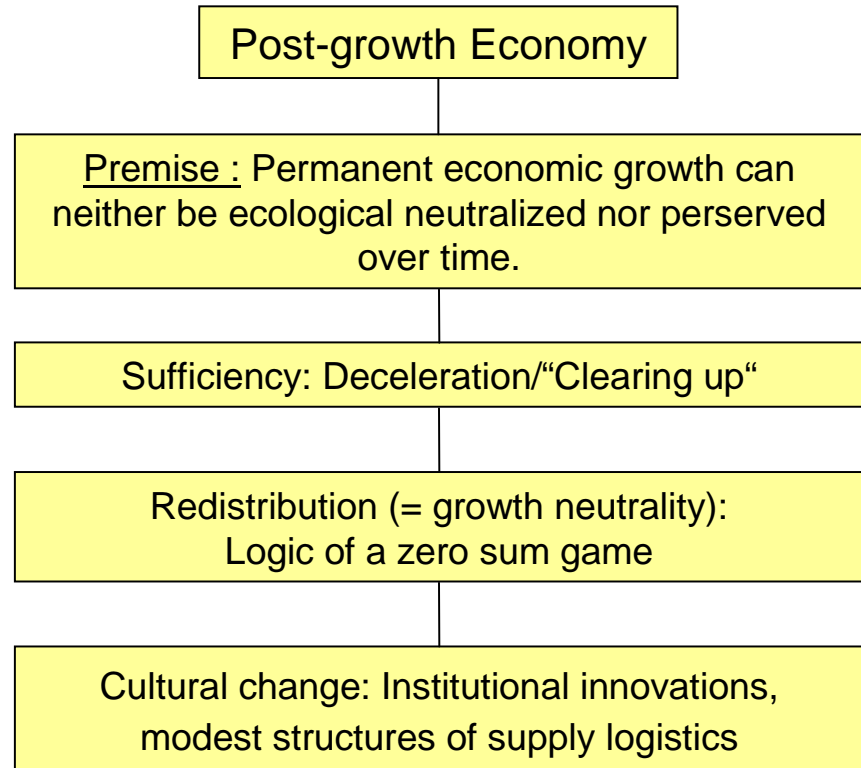
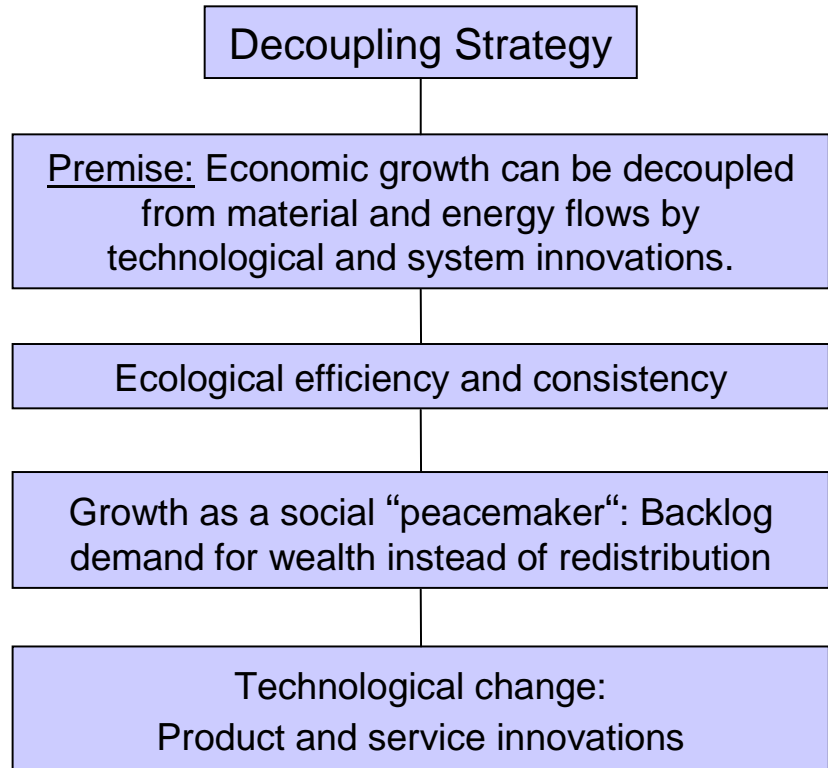
- Forestry (Middle Ages)
- Club of Rome (1972)
- Entropy Law and the Economic Process (1971)
- Brundtland Report (1986)
- Agenda 21 (1992)
- ZD I (1996)
- Economy Beyond Growth (1996)
- Natural Capitalism (2000)
- The New Consumers (2005)
- ZD II (2008)

**“Tripple Bottom Line”
“Three Pillars” as coequal aims**

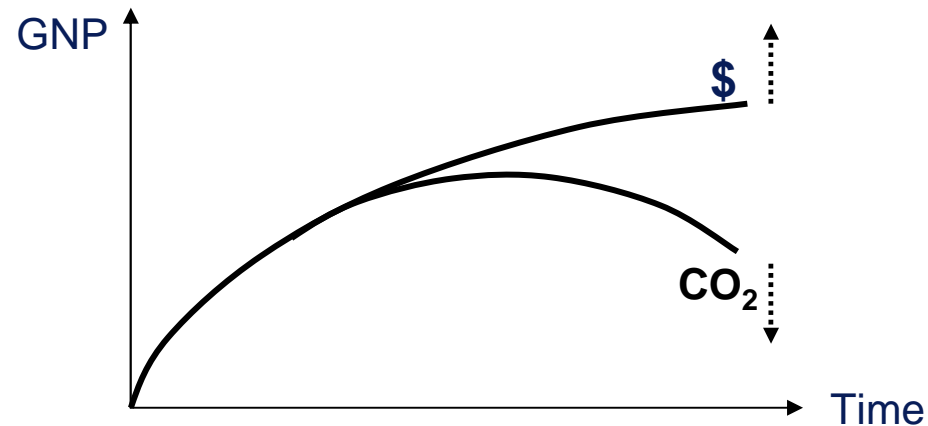
**Long time precautionary principle:
Temporal and spacial generalizability**



Two Philosophies of Sustainability



Ecological Efficiency and Consistency: Decoupling Economic Growth



Ecological **Efficiency** (increasing the resource productivity)

- Minimization of the „ecological rucksack“ and primary energy input
- Optimizing the relation of input and output
- Application to any hardware (products, technology) and services

Ecological **Consistency** (zero emission systems, upcycling, eco-effectivity)

- Vision of an economy consisting of closed loops; waste turns into „food“
- Bionik: Applying the economic design and principles of nature
- Principles: (1) Biodegradable substances, (2) Renewable energy, (3) Technical cycles

Supply Chain Approach

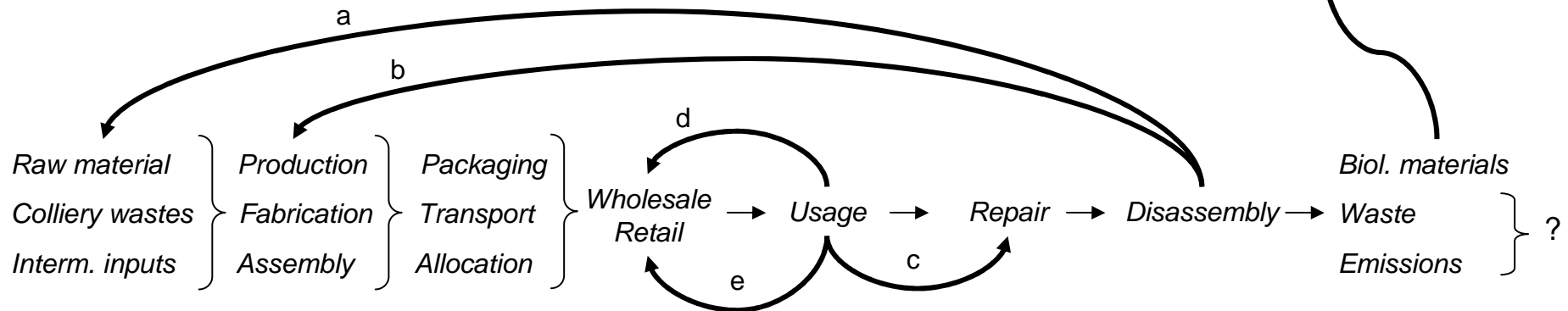
Sustainable supply chain management as a synthesis of efficiency and effectiveness/consistency

Efficiency:

Technical measures to reduce material and energy throughput

Effectiveness:

Integration into biological cycles



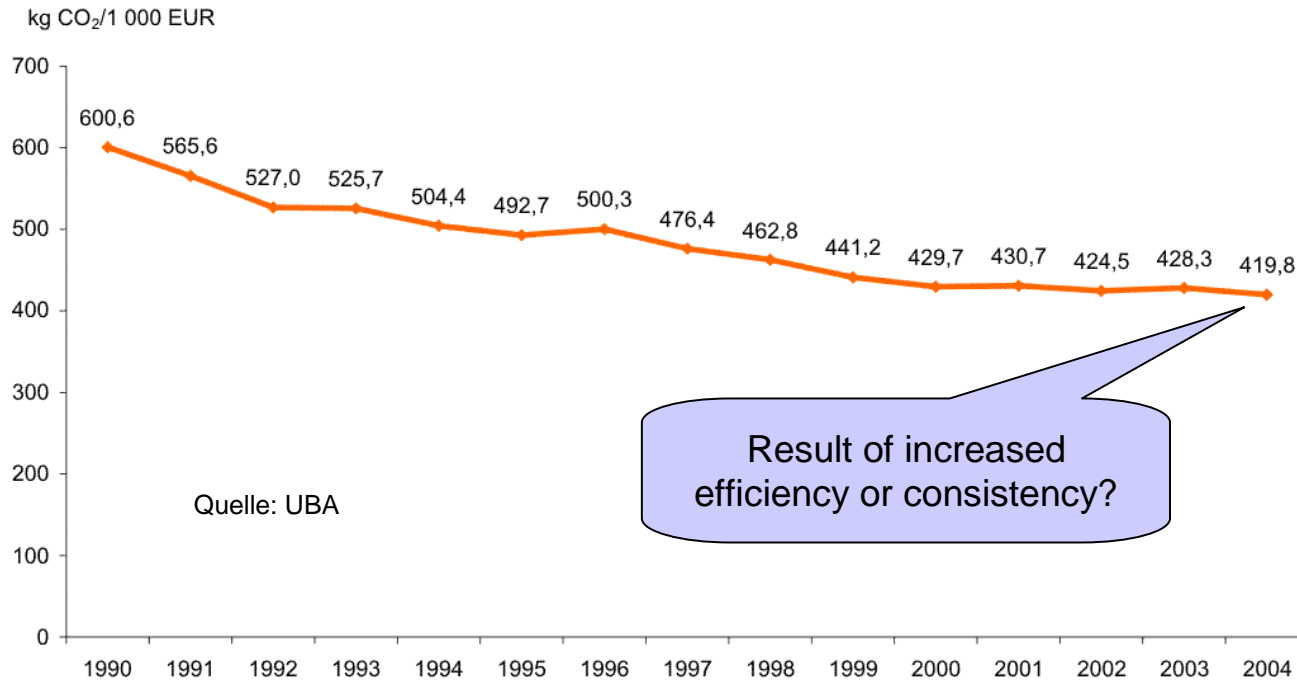
Intersection of efficiency and effectiveness

- a) Recycling of raw materials
- b) Recycling of disassembled moduls
- c) Extension of the use period, maintenance, intensification of use
- d) Remanufacturing
- e) Trading of used goods

Source function/
Input side

Drain function/
Output side

Intensity of CO₂ Emissions of the German Economy

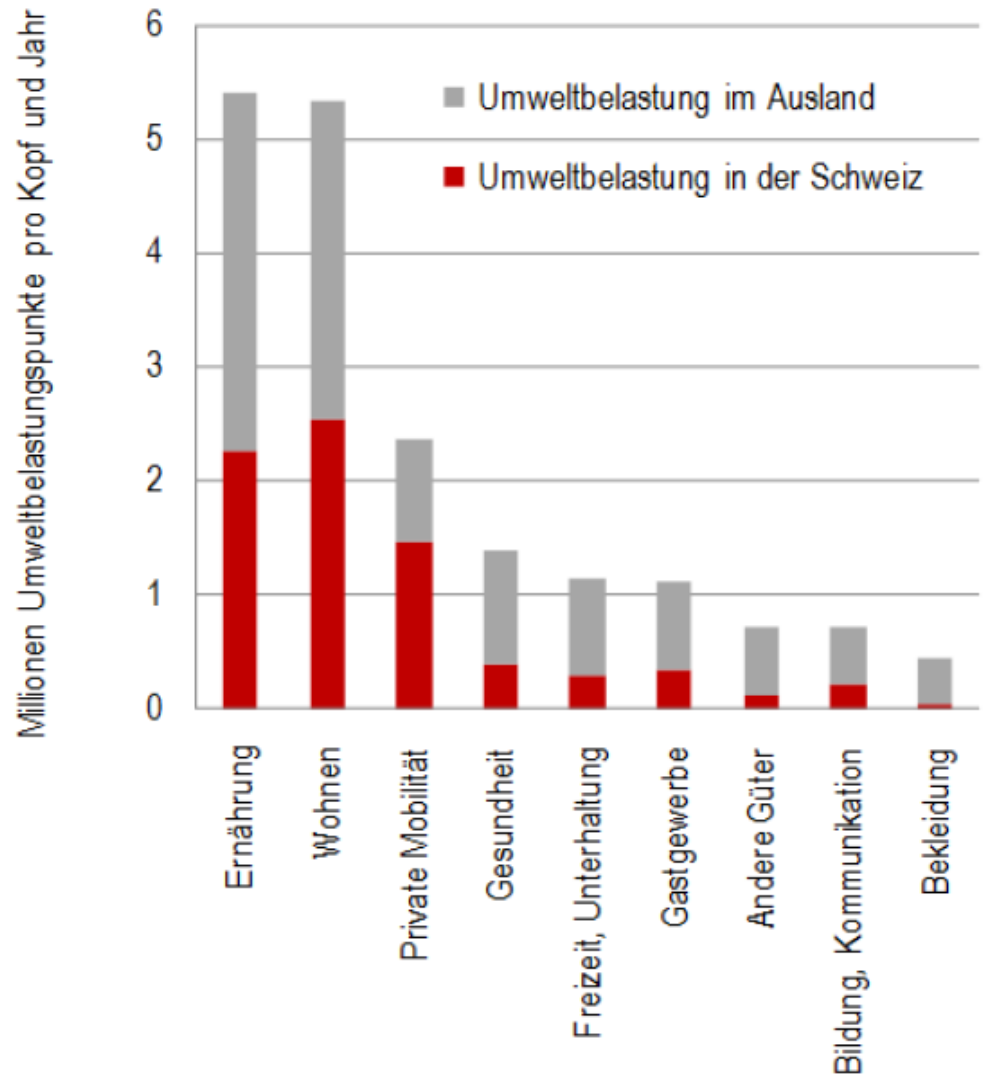


...but what does this information say?

- Rebound effects due to growing consumer demand are not included
- NOT decoupling but the break down of entire industries in east Germany which is an non-recurring occasion was the reason
- The “dirty“ part of the production chain has been shifted to other regions

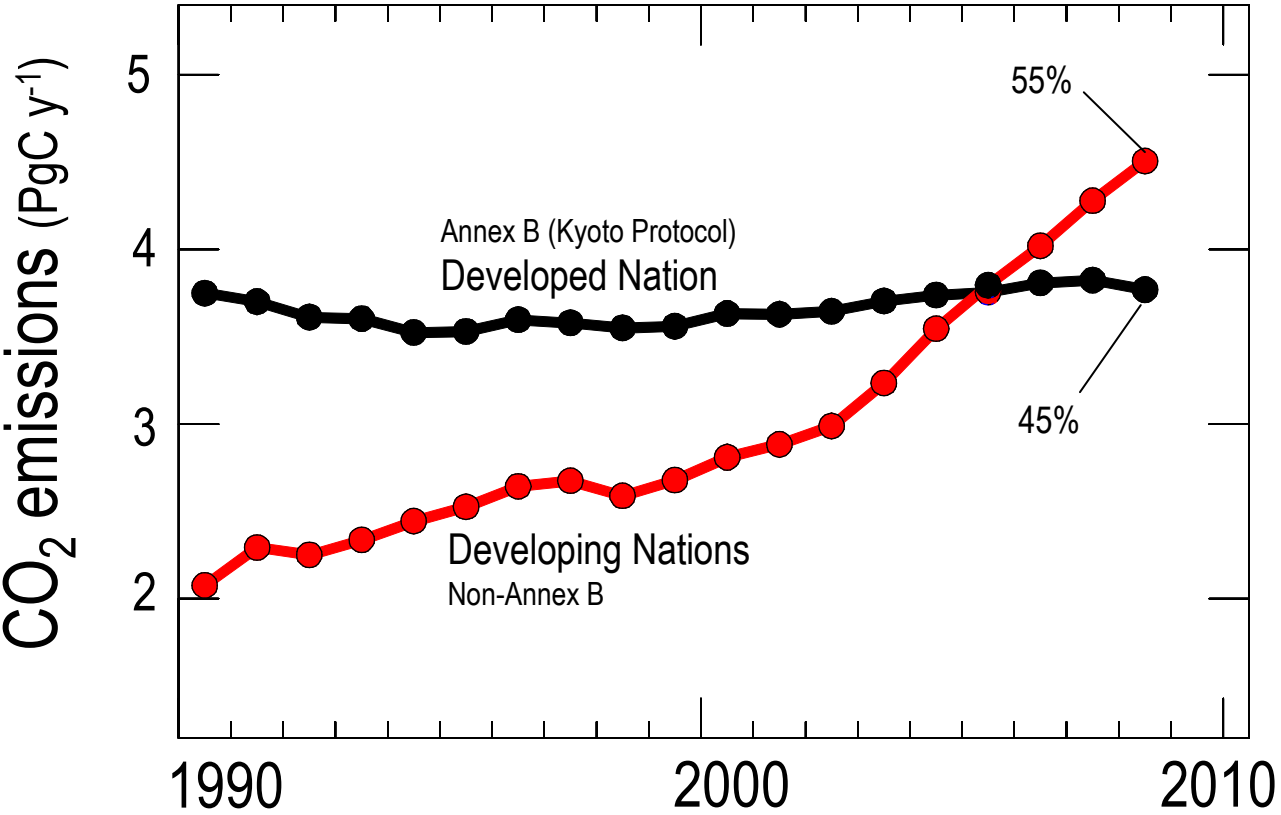
Shifting Environmental Damages to other Regions

Example Switzerland: 60%



Quelle: Federal Office for the Environment FOEN Switzerland (2011): Environmental impacts of Swiss consumption and production (www.bafu.admin.ch/uw-1111-e)

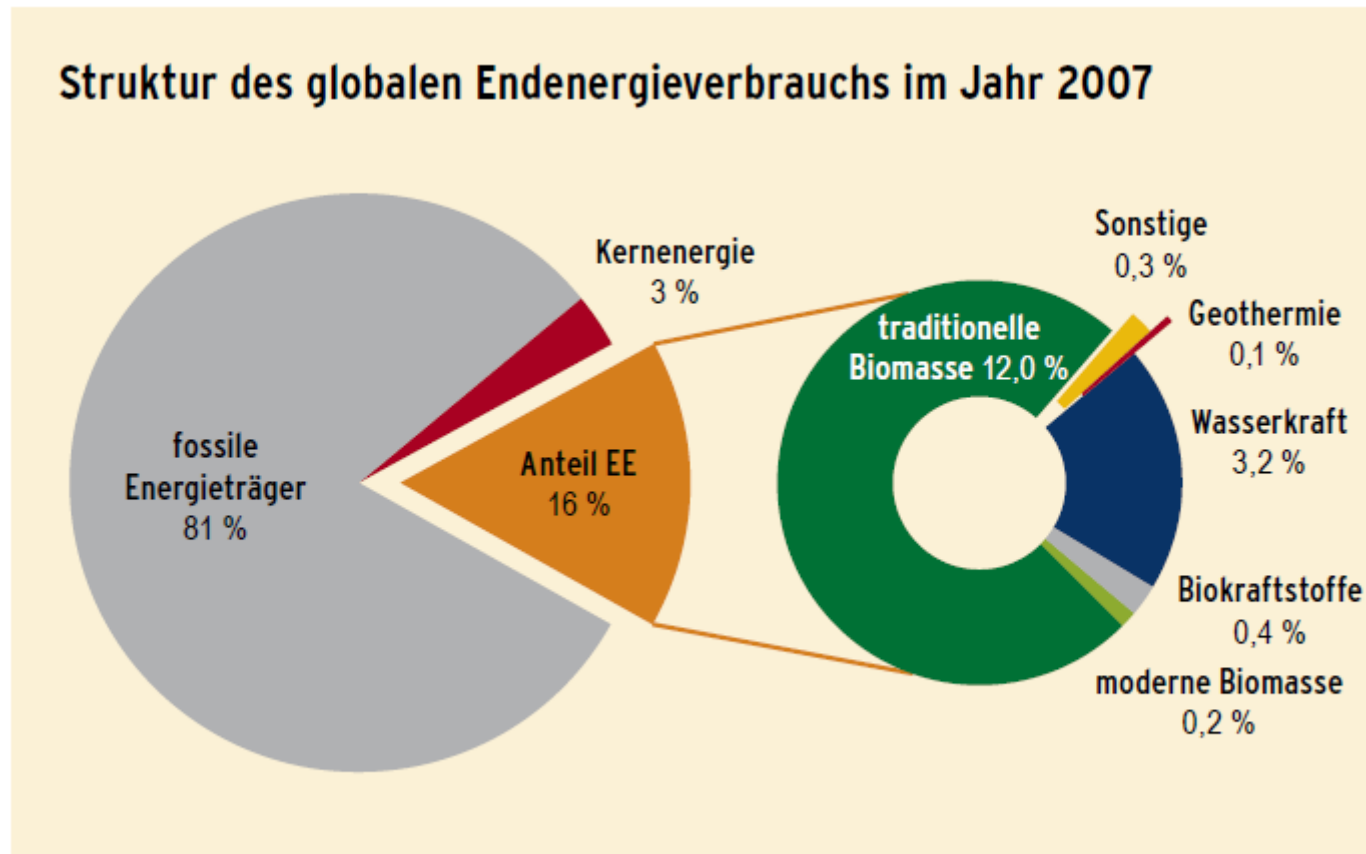
CO₂-Emissions: Global Dimension



Quelle: Le Quéré et al. 2009, Nature Geoscience; CDIAC (2009)

The Role of Renewable Energy Resources: Global Dimension

Solar and Wind Energy: 0,2 %

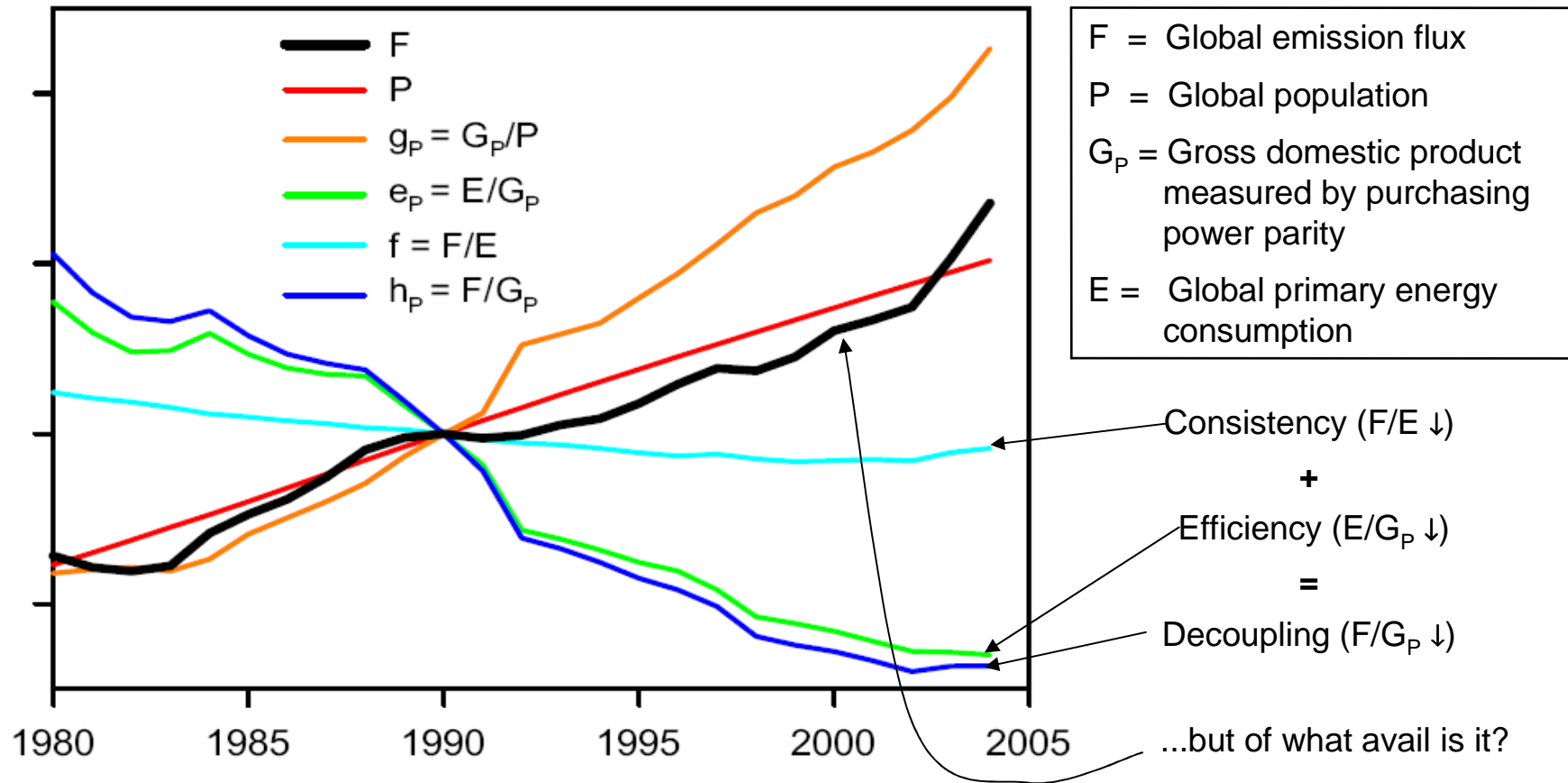


Quelle: IEA 2009 und BMU 2010

Decoupling Growth from CO₂ Emission is not Sufficient!

Study of the Global Carbon Project:

Raupach/Marland/Ciais/Quere/Canadell/Klepper/Field (2007): Global and Regional Drivers of Accelerating CO₂ Emissions, in: Proceedings of The National Academy of Sciences of the USA



Turning Points

- There are serious shortcomings of the prevailing decoupling strategy; technology centered concepts may fail because of so called „rebound effects“
- Reconsidering the growth paradigm: Do we need a new interpretation of prosperity?
- Sustainability: A shift from moral imperatives to pure resilience
- Life style issues become more important: Individual carbon footprint as the only „true“ or consistent measure for sustainability performance?

Types of innovation

Product – Process – Service – System – Organization – Institution

