Forests and climate – the carbon cycle

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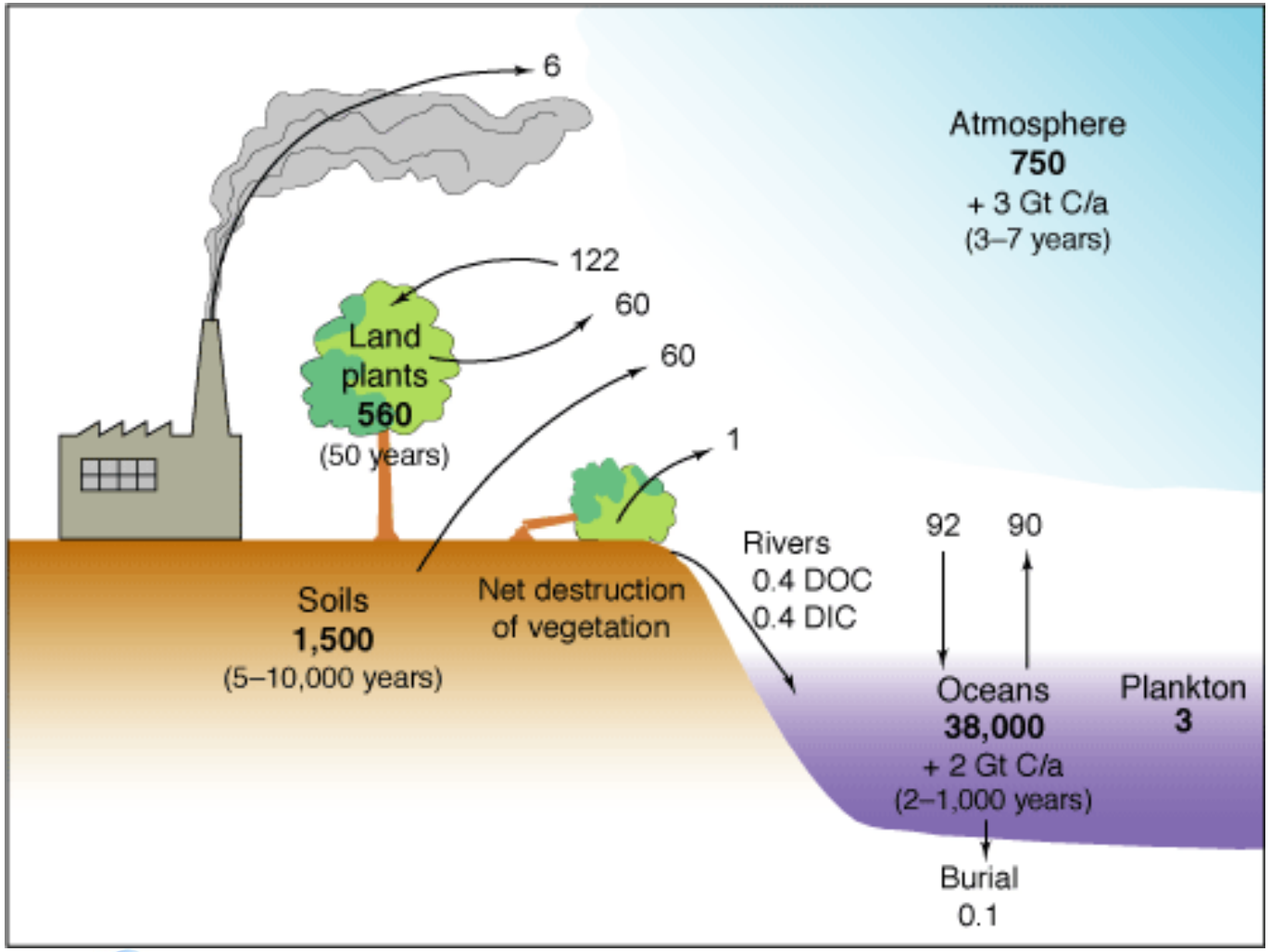
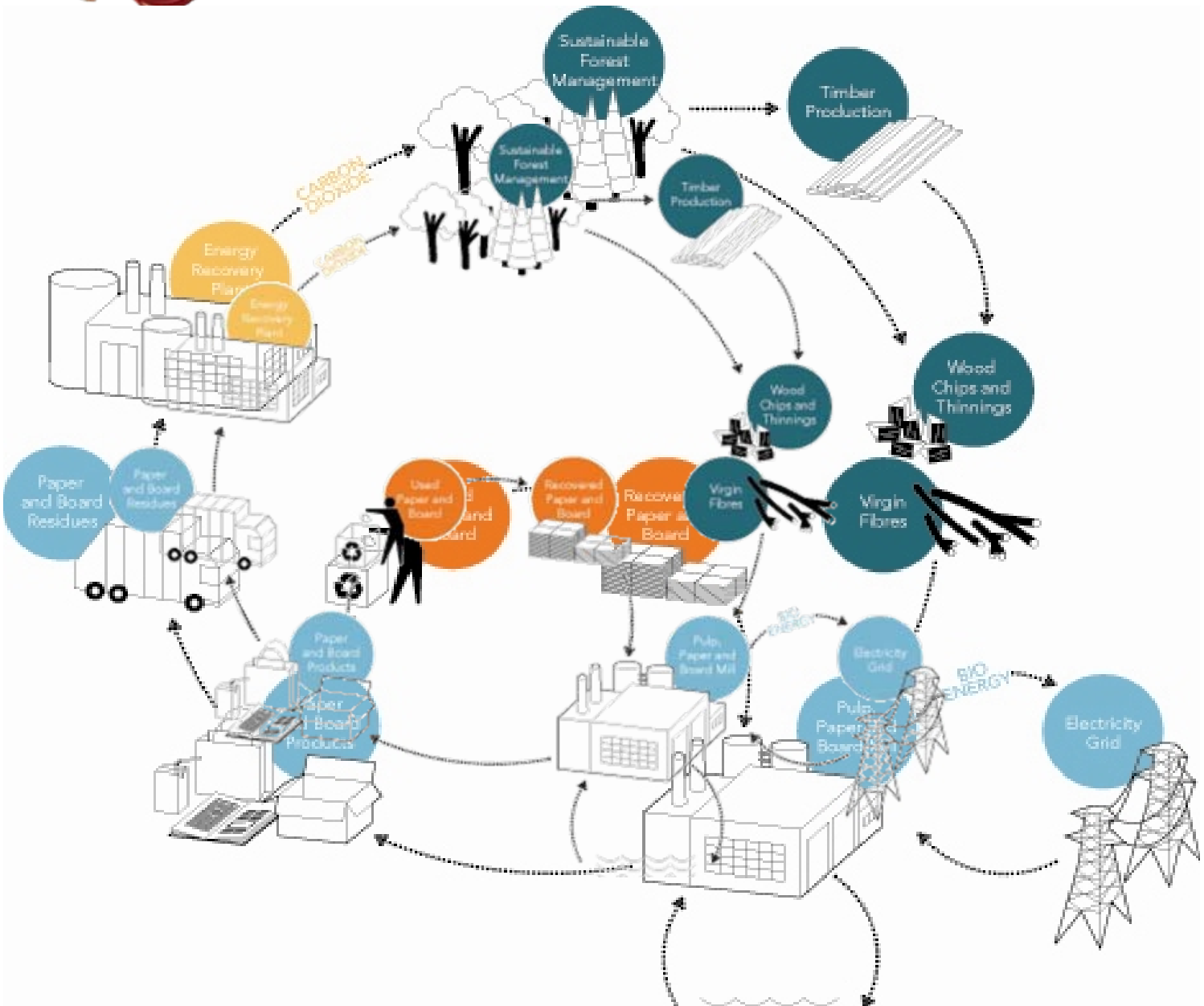
Simple carbon cycle



The forest carbon cycle



What do the scientists say?

„*In the long term, a sustainable forest management strategy aimed at mitigating or increasing carbon stocks, while producing an annual sustained yield of timber, fibre or energy from the forest, will generate the largest sustained mitigation benefit.*“

IPCC 4th Assessment Report, Chapter 9

EU forest carbon profile

- EU forest area: 154 575 000 ha
- CO2 removals by EU forests (395 $MtCO_2eq$)
  - - 376 $MtCO_2eq$ from forest management
  - - 38 $MtCO_2eq$ from afforestation and reforestation
  - + 19 $MtCO_2eq$ from deforestation
- Storage in harvested wood products
  - Under the production approach: 84 $MtCO_2$
  - Under the Stock Change Domestic approach: 20 $MtCO_2$

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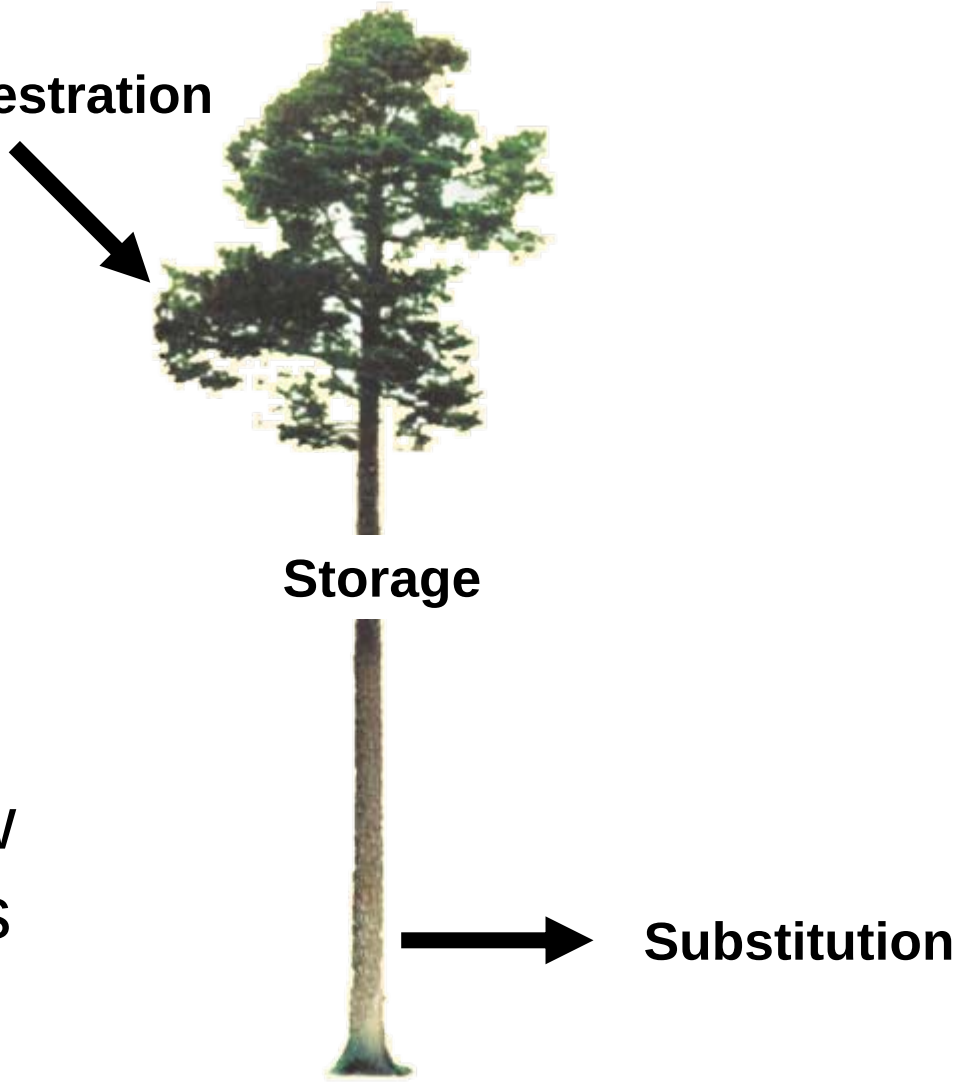
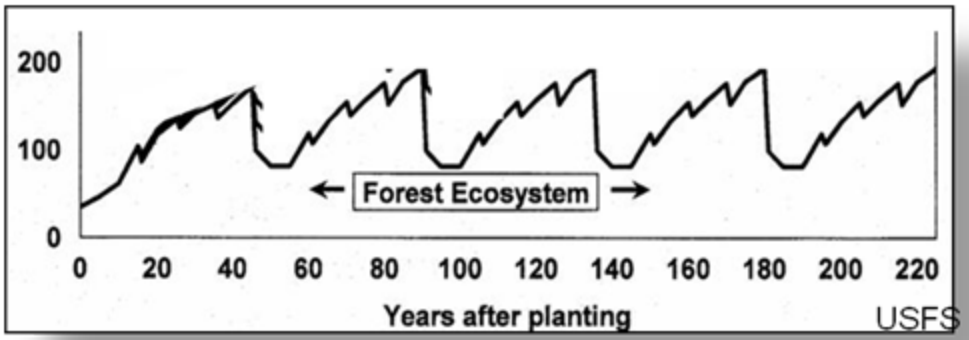
- Sequestration of carbon in forests (sinks)
- Storage of carbon in forest products
- Substitution of other raw materials or fossile fuels



Sequestration

Sustainably managed forests act as sinks

- In the regions of the world responsible for most of the global harvest (Northern America, Europe), forest carbon stocks are stable or growing.
- Nearly 90% of forests in industrialized countries are managed “according to a formal or informal management plan”
- Forest certification (FSC, PEFC) guarantees sustainable forest management of
  80 million ha in the EU



Storage

- The amount of carbon stored in products in use is increasing because…
  - Some products remain in use for long times
  - More products are made every year due to population growth and increasing standards of living

- Some products are discarded in landfills where some of the carbon remains for many years
- As more carbon is accumulated in products, more is kept out of the atmosphere
- Even paper, when collected and recycled stores carbon !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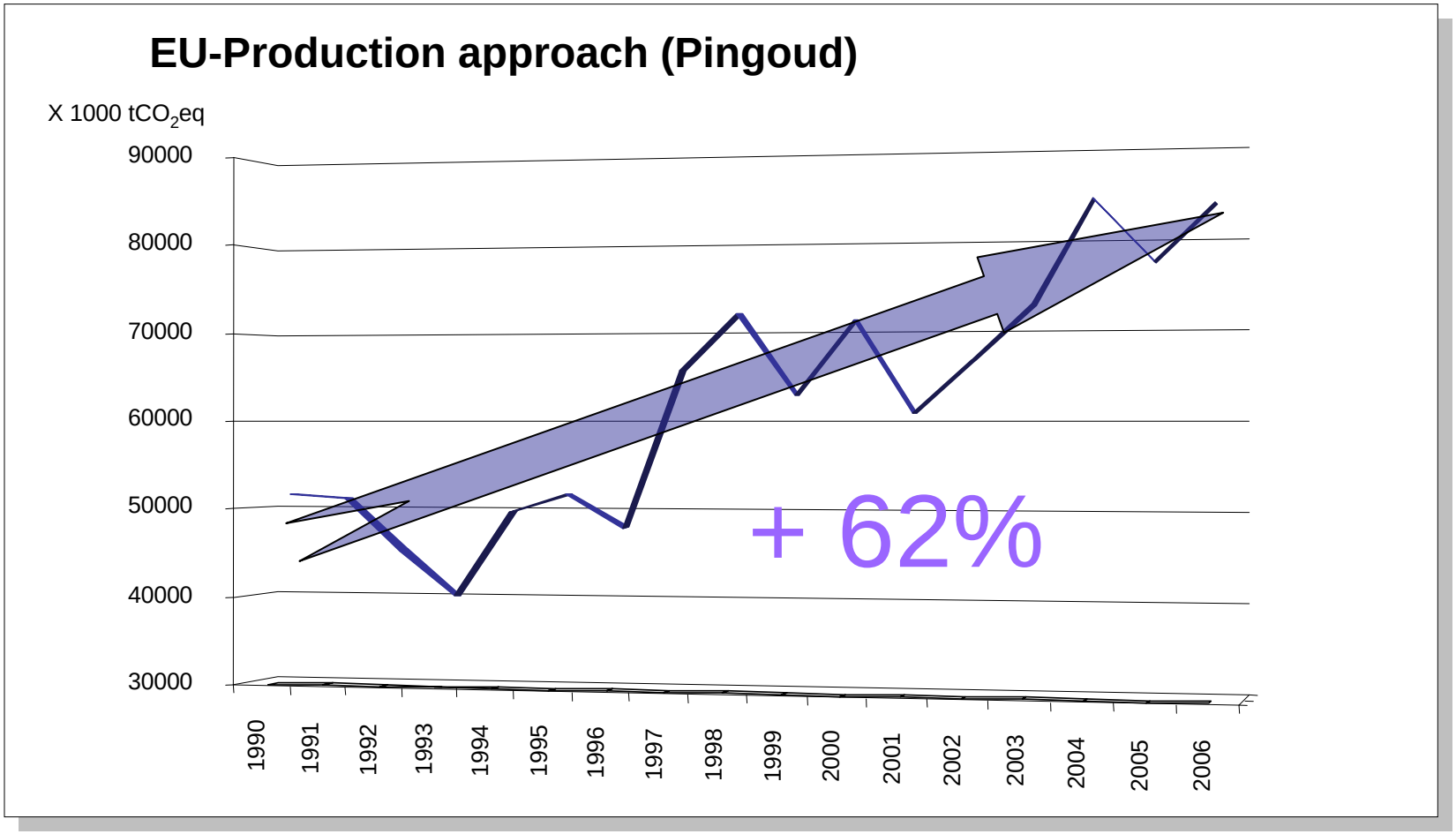
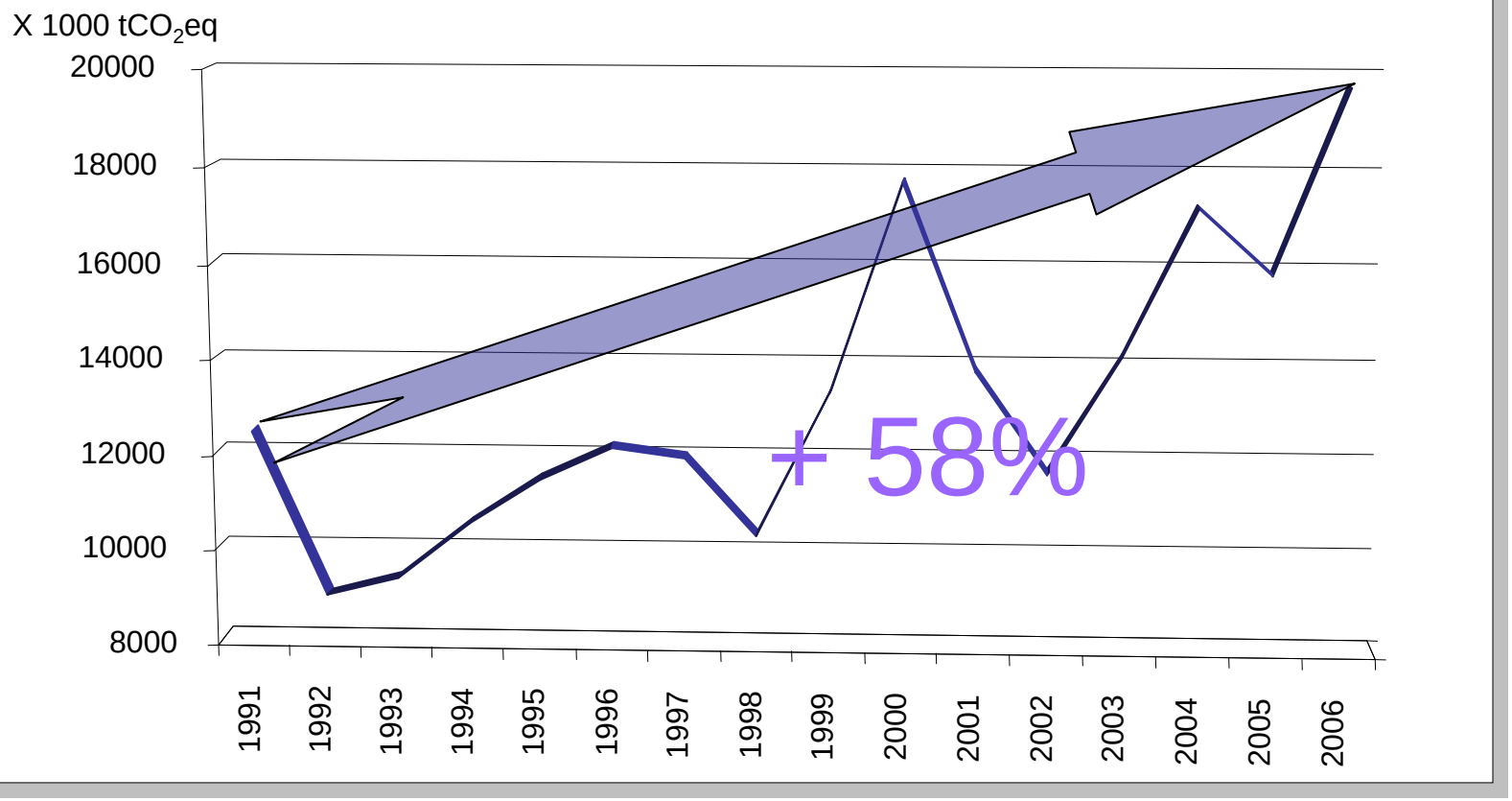
Storage

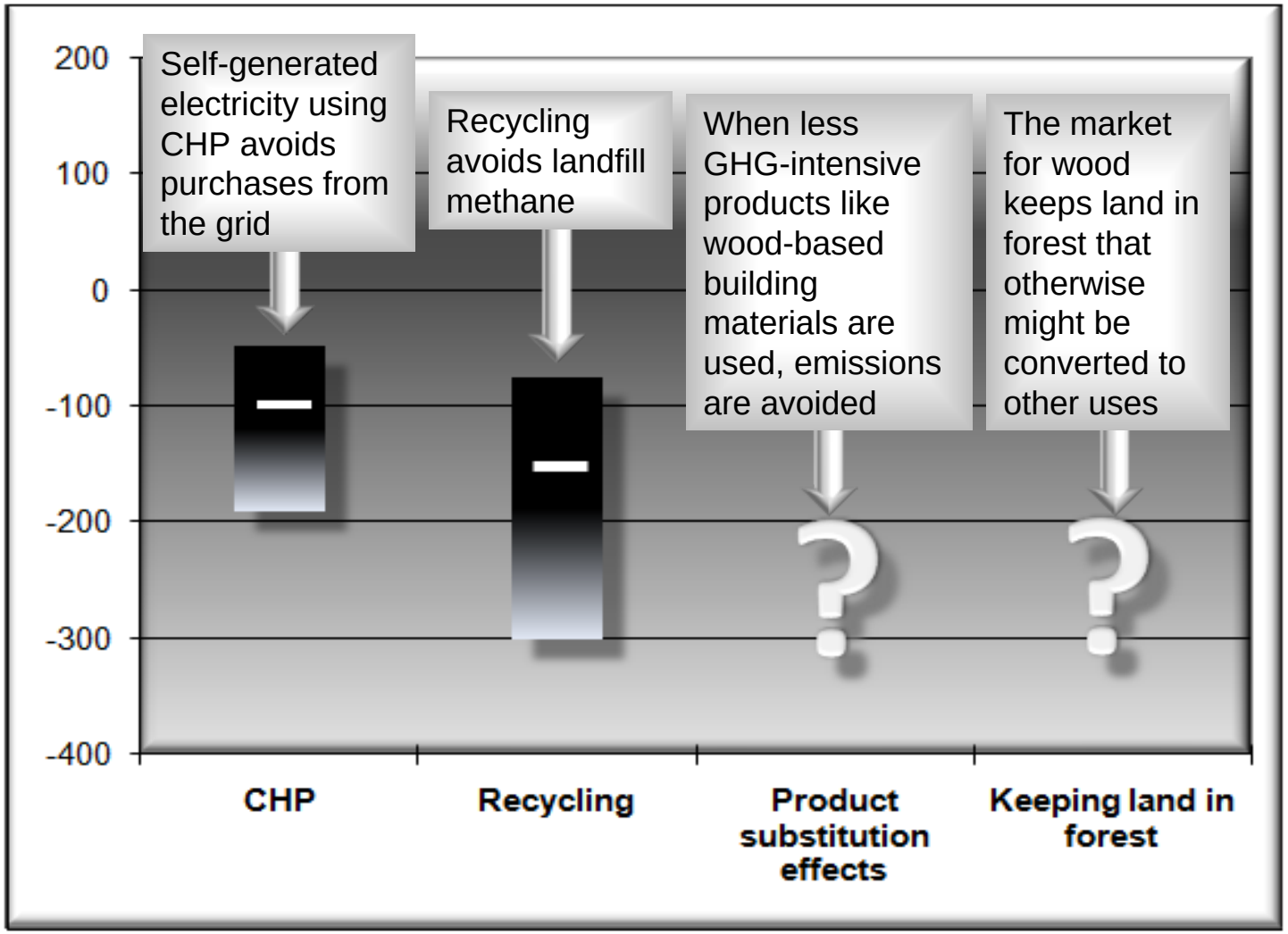

EU-Production approach (Pingoud)
X 1000 tCO2eq
90000
80000
70000
60000
50000
40000
30000
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
+ 62%

Storage

EU- Stock change domestic production & consumption (Pingoud)



Substitution = avoided emissions

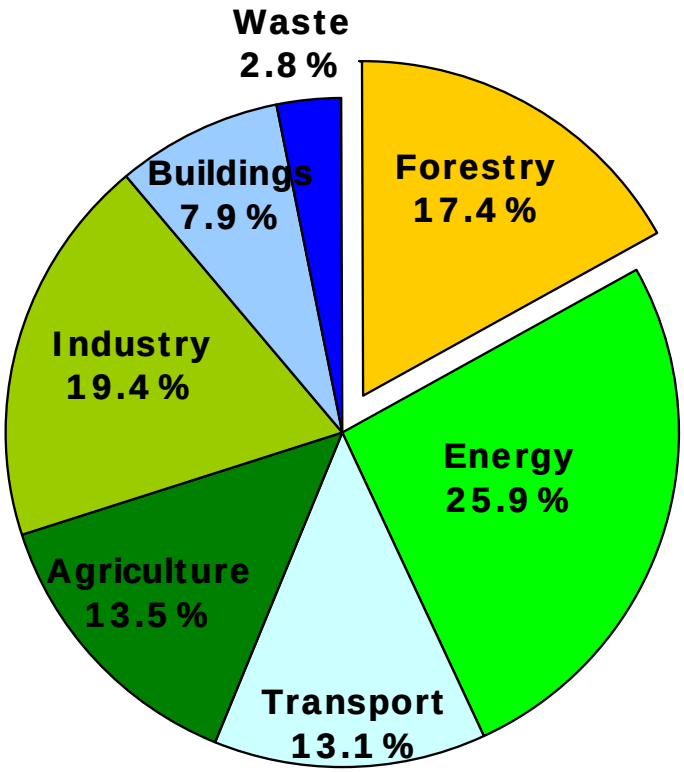


And paper?...

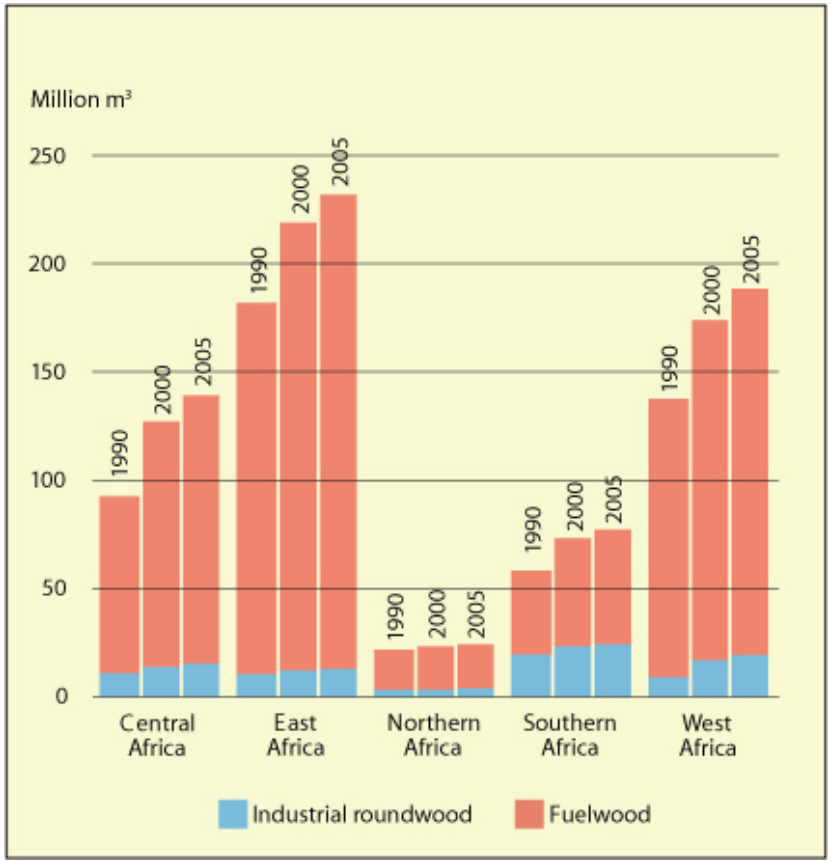
- Half-life: 2 years
- Storage 2006: 107 million tons CO_2
- Annual removal 2006: 9.4 million tons CO_2
- Recycling rate: 66%
- RES producer and user
  - 20% of EU-biomass-based energy production
  - 55% biomass-based energy consumption

Few words about REDD

Anthropogenic GHG emissions in 2004



Wood removals in Africa



Source: FAO

Few words about REDD

- Money transfer?
- Move towards Sustainable Forest Management?
- Contradicting approaches (restoring degraded and deforested land vs. Feedstocks needs for bioenergy)?
- What is needed?
  - Identify the drivers of deforestation
  - Establish good forest governance
  - Secure clear and stable tenure rights
  - Promote sustainable development

Take home !

- To obtain the carbon advantages and other benefits of forests and forest biomass you need…
  - Land remaining in sustainably managed forests
  - Adequate supplies of forest biomass (increased recovery rates and higher forest productivity)
  - Efficient use of forest biomass
  - Energy efficient manufacturing
  - End-of-life management that reduces CH4 releases
  - Forest-derived products that store carbon and substitute for more GHG-intensive products
  - Proper attention to the role of avoided emissions