

# Ecological debt

## Module Energy/Climate

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“Climate Change and The Concept of Ecological Debt”  
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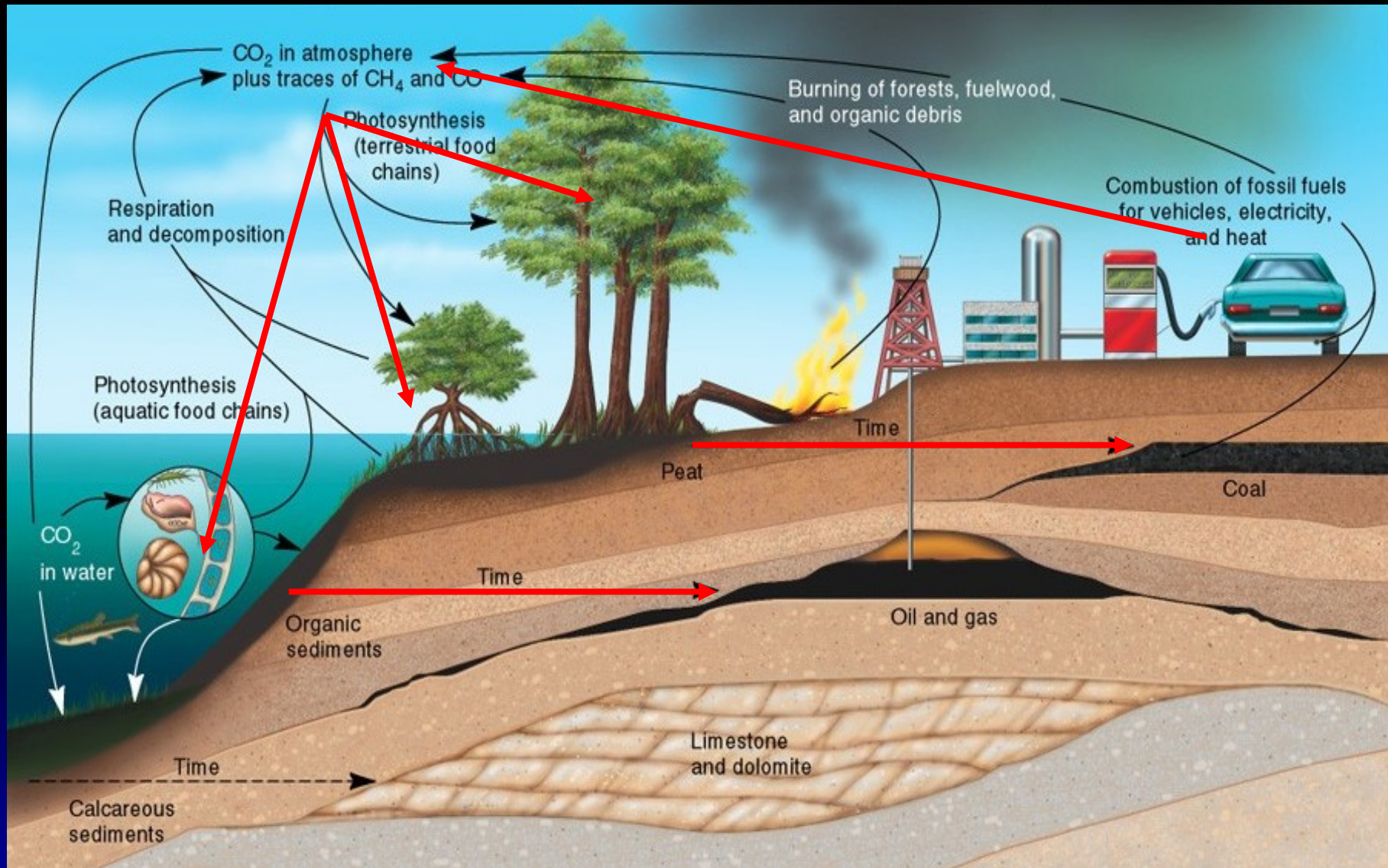
# The **ecological debt of Belgium** consists of

- (1) The ecological damage caused over time by Belgium in other countries or in an area under jurisdiction of another country through its production and consumption patterns, and/or
- (2) the ecological damage caused over time by Belgium to ecosystems beyond national jurisdiction through its consumption and production patterns; and/or
- (3) the exploitation or use of ecosystems and ecosystem goods and services over time by Belgium at the expense of the equitable rights to these ecosystems and ecosystem goods and services by other countries or individuals

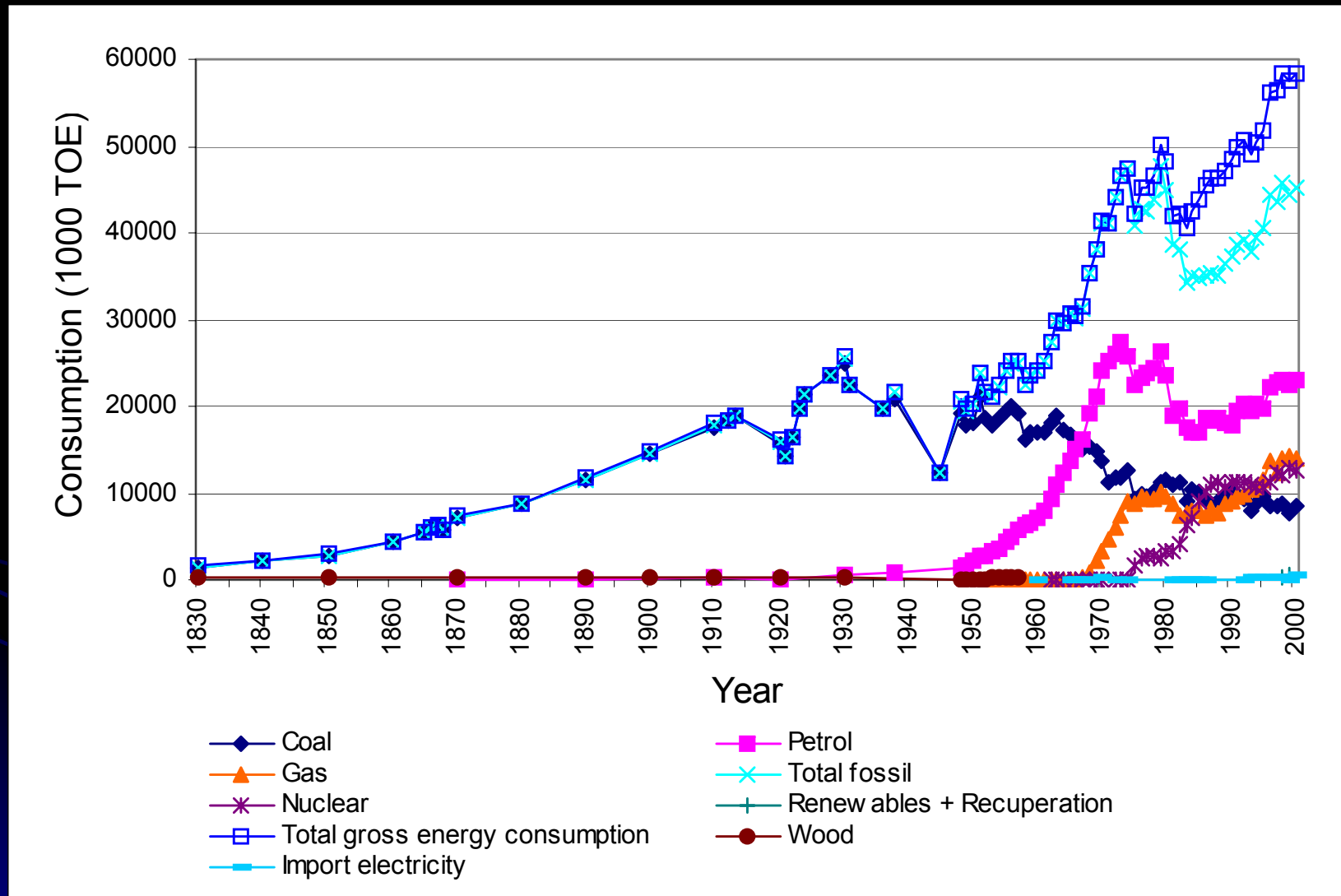
# Overview

- Introduction: the carbon cycle
- Fossil energy consumption in Belgium
- Fossil energy and ecological debt in a global context
- Ecological debt and fossil fuel consumption/depletion
- The Carbon Debt
- Conclusions

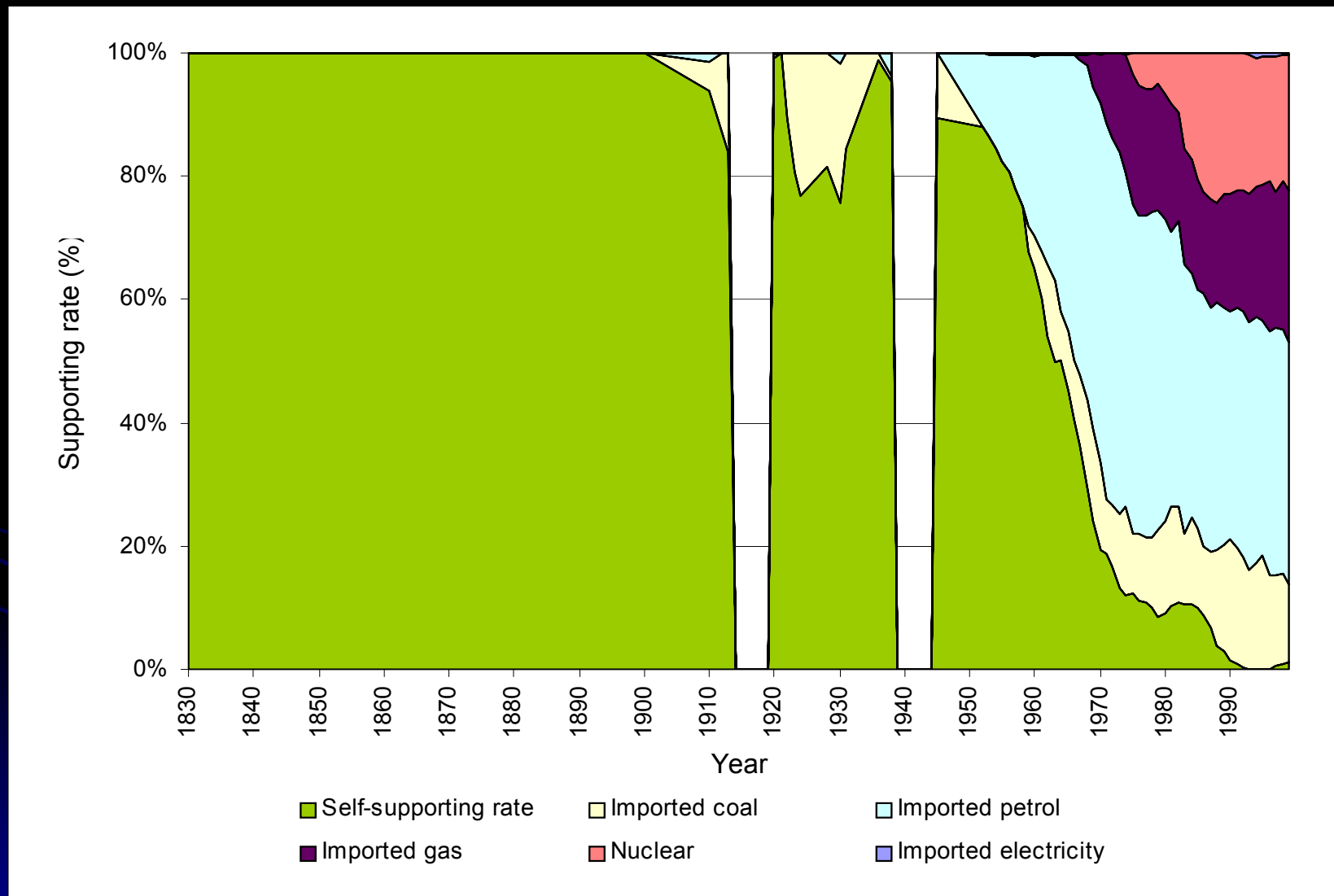
# The carbon cycle



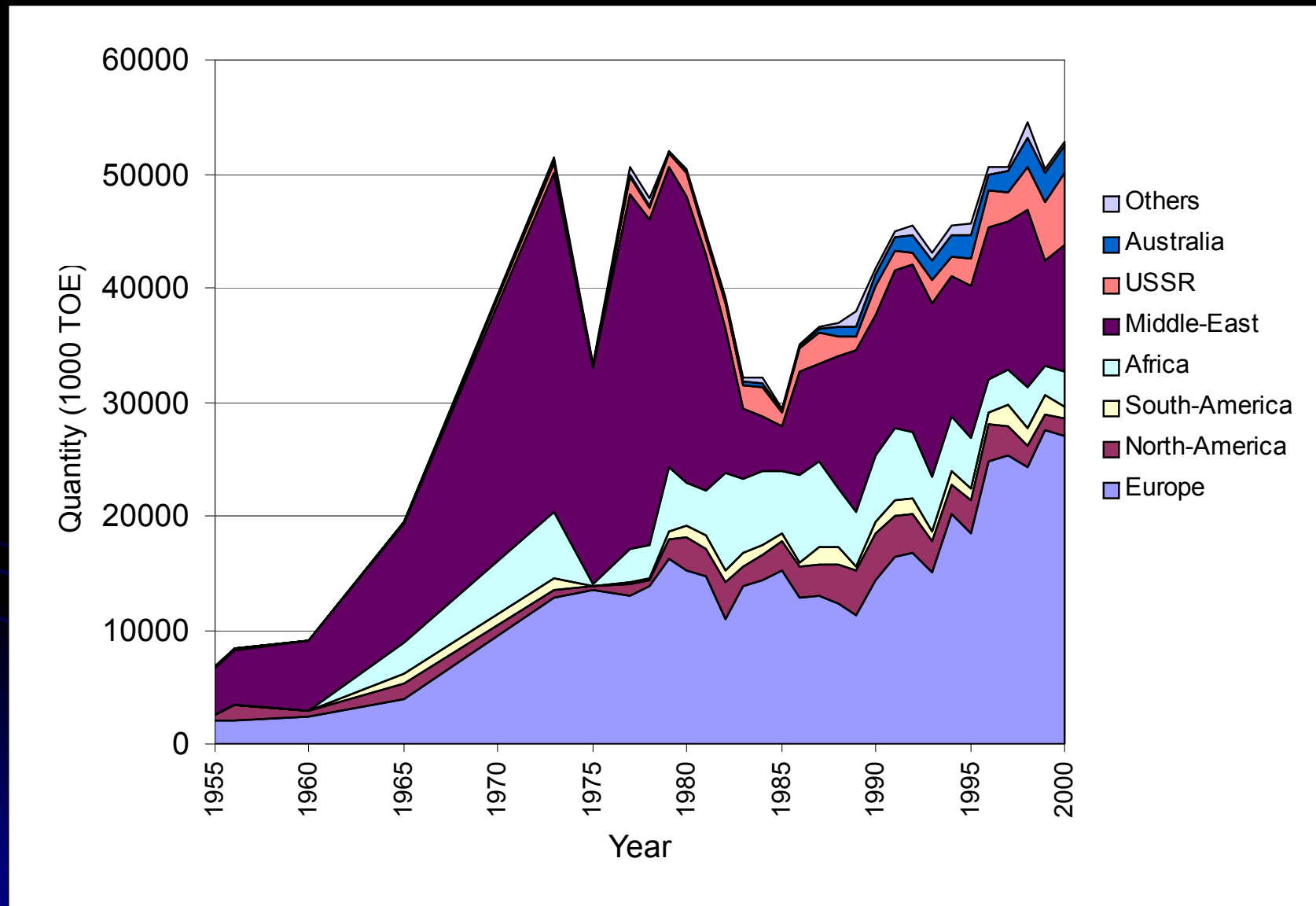
# Fossil fuel consumption in Belgium



# Energy (Self) Supporting Rate



# Import raw fossil fuels



# Belgium & Energy

- 1830-2000: exponential increase in energy consumption
- Belgium: locked into a (fossil) energy based infrastructure
- Energy: from 100% self-supporting to 100% importing
- Exported environmental & social pressure (extraction)

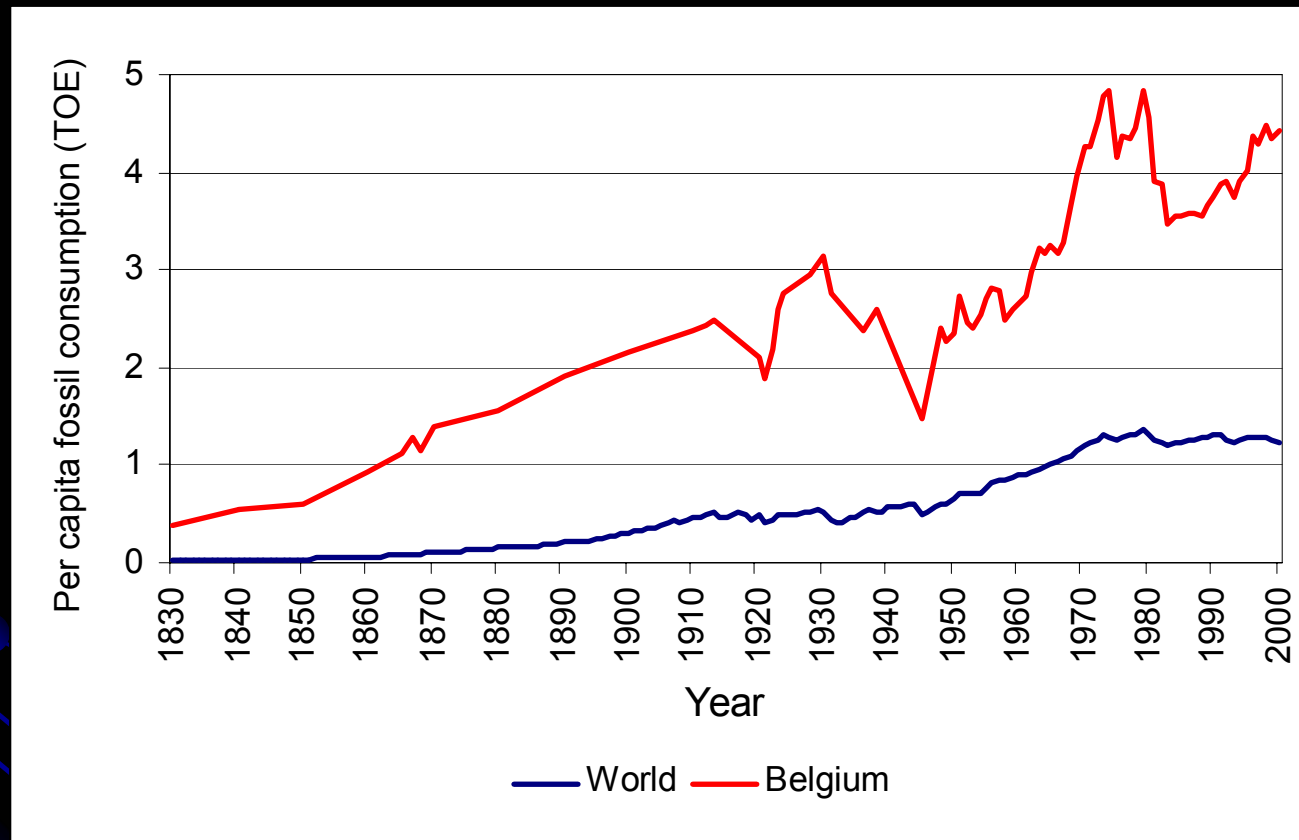
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# Ecological debt

- Ecological damage due to
  1. Extraction activities (degradation & pollution)
  2. Depletion of fossil fuel reserves
  3. Climate change from CO<sub>2</sub> emissions
- Exploitation/use of ecosystem goods at the expense of the equitable rights of others
  1. CO<sub>2</sub> absorption capacity
  2. Fossil fuel reserves

# Ecological debt and fossil fuel consumption/depletion



→ Proven World fossil fuel reserves (BP, 2002):  
850 billion TOE = 140 ton/capita



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## → ● The Carbon Debt

- Definition
- General elements for implementation
- The Belgian Carbon Debt

## ● Conclusions

# Defining the Carbon Debt

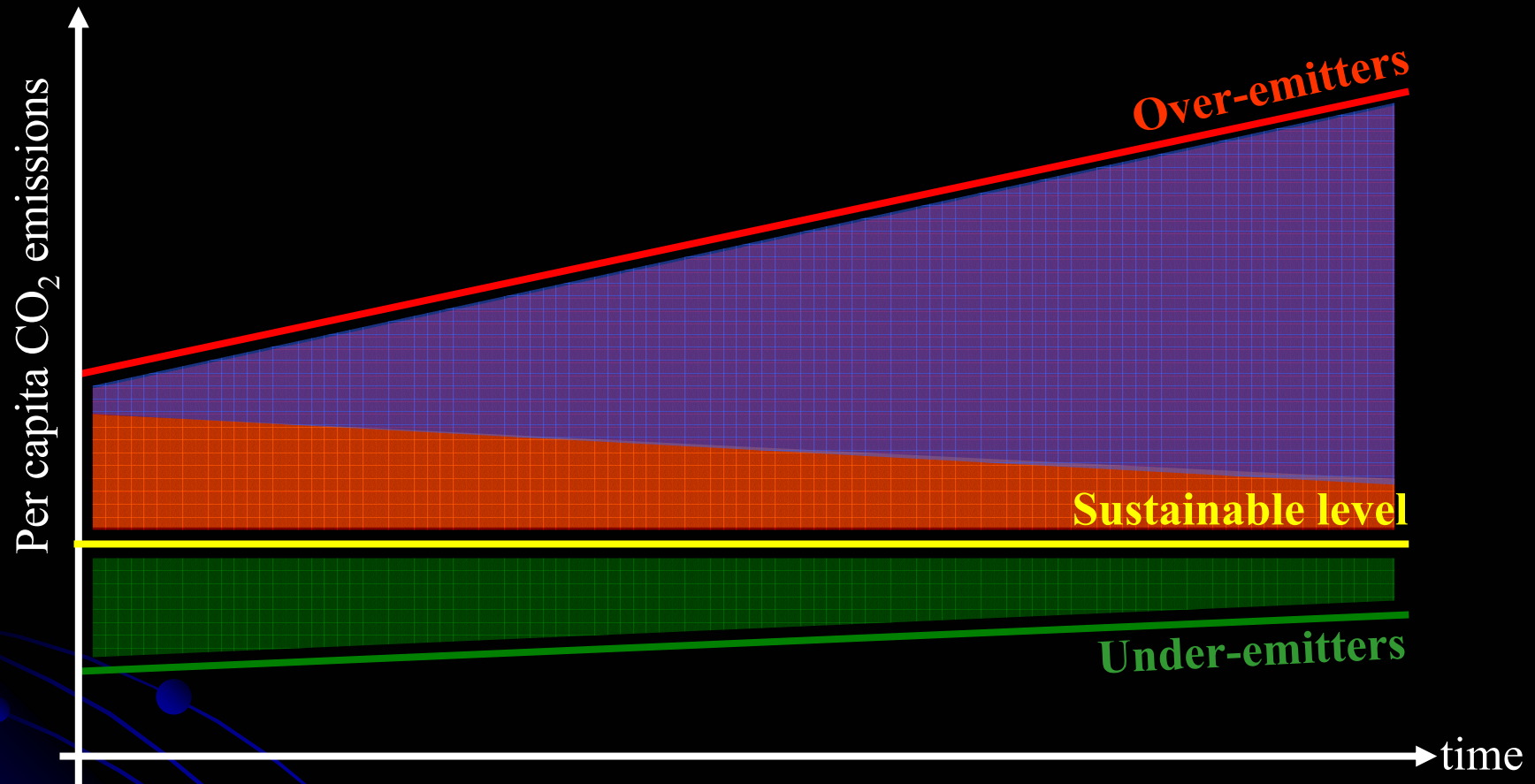
The **carbon debt** of a country A consists of:

1. “over-emission of CO<sub>2</sub> by country A over time with respect to **a sustainable level**”, and/or
2. “over-emission of CO<sub>2</sub> by country A over time at the expense of the **equitable rights** to the absorption capacity of the atmosphere by other countries or individuals”

# Defining the Carbon Debt

- **Sustainable level:** 60% reduction (cfr. 1990)
  - no 'absolute' levels of sustainability
  - to "stabilise the world's climate & to avoid worst consequences" (IPCC)
  - Kyoto reduction for Belgium: 7,5%
- **Equitable rights:** equal per capita?
  - atmosphere 'belongs' to nobody
  - varying geographical, climatic, ... conditions
  - adjusted egalitarianism

# Debtors and Creditors



Carbon debt:

partly interstate: Historical Carbon Debt (HCD)

Over-emitters:  $HCD +$  (debtors)

Under-emitters:  $HCD -$  (creditors)

intergenerational: Generational Carbon Debt (GCD)



# Implementing the carbon debt

- GCD: a fund to assist future climate change victims?
- HCD: basis for allocating future emission rights?
  - HCD as a measure for historical responsibility
  - Common but differentiated responsibilities (UNFCCC)

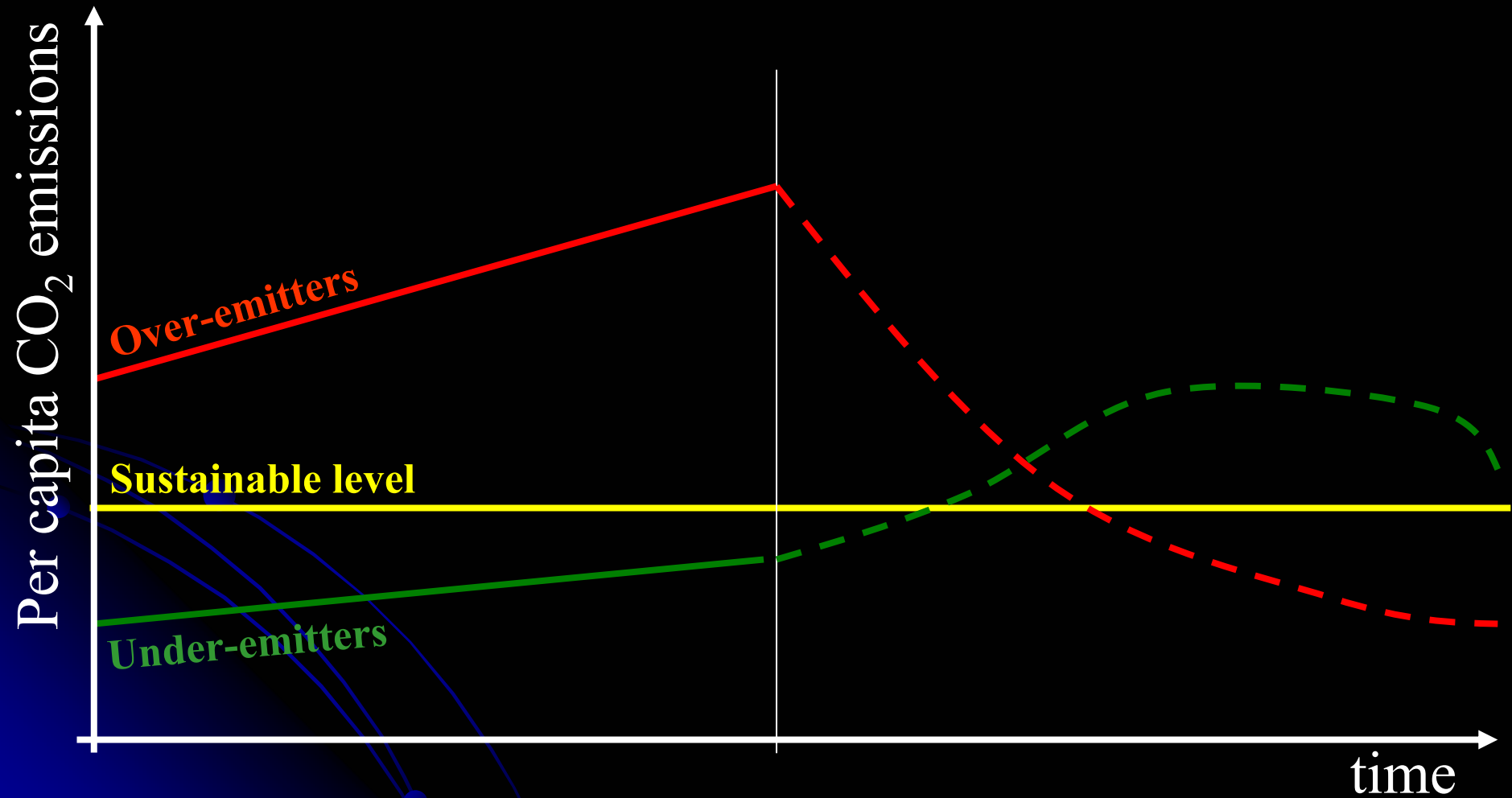
$$\text{emission right} = \text{target emission} - \text{HCD}/N$$

(Compensation of the interstate HCD over N years)

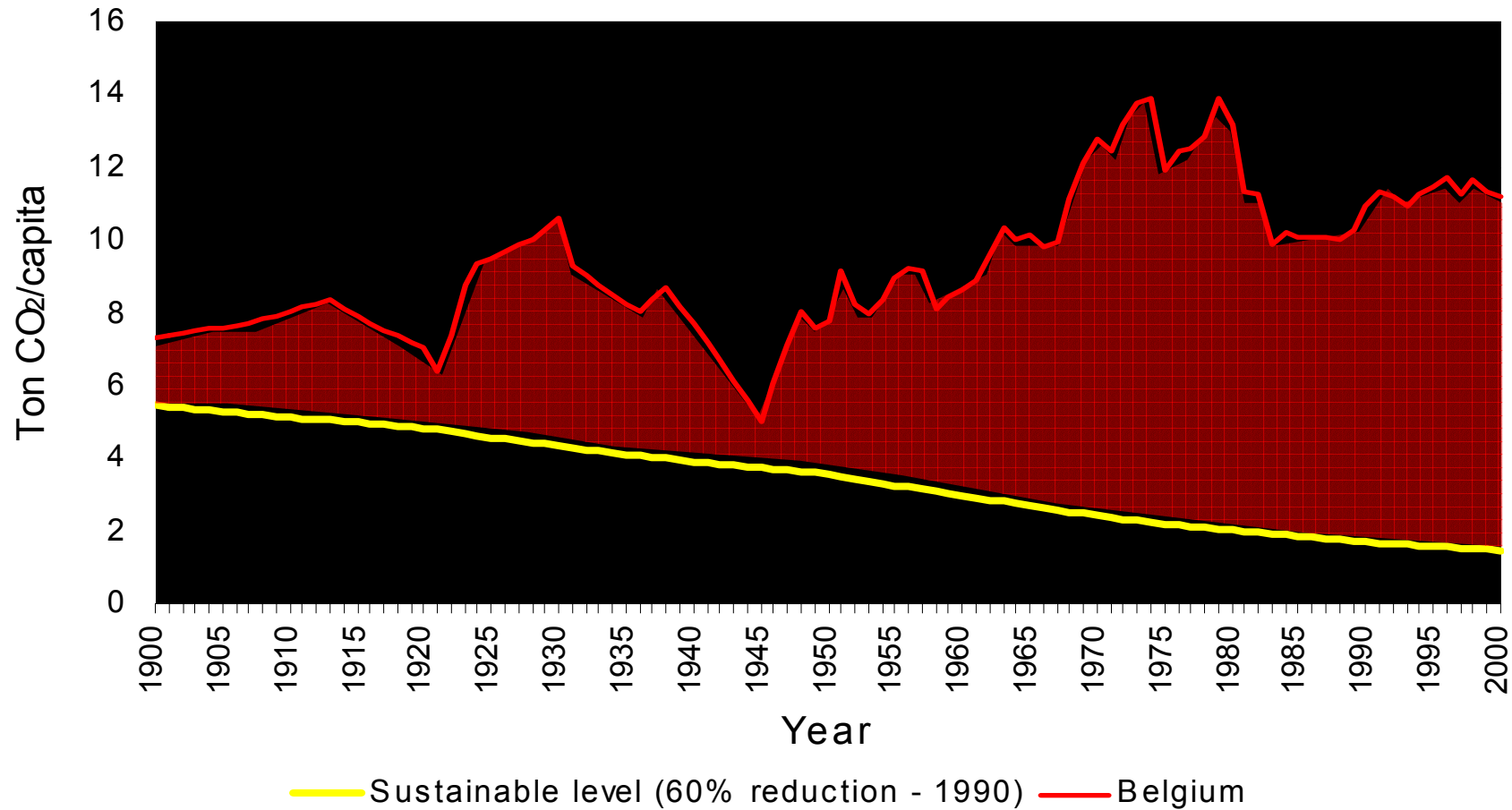
- Developed countries (HCD +) take the lead
- Developing countries (HCD -) get space to grow



# Contraction, Convergence and Compensation



# The Belgian Carbon Debt



total carbon debt = 5787 million ton CO<sub>2</sub>

≅ 58 billion €



# Conclusions

- Belgium's infrastructure has been increasingly based on *finite foreign (fossil) energy*
- Need for 'Post-Fossil' Development Patterns
- Developed countries could take the lead by recognizing and compensating their Carbon Debt