Post-Durban Expectations for an International Climate Policy

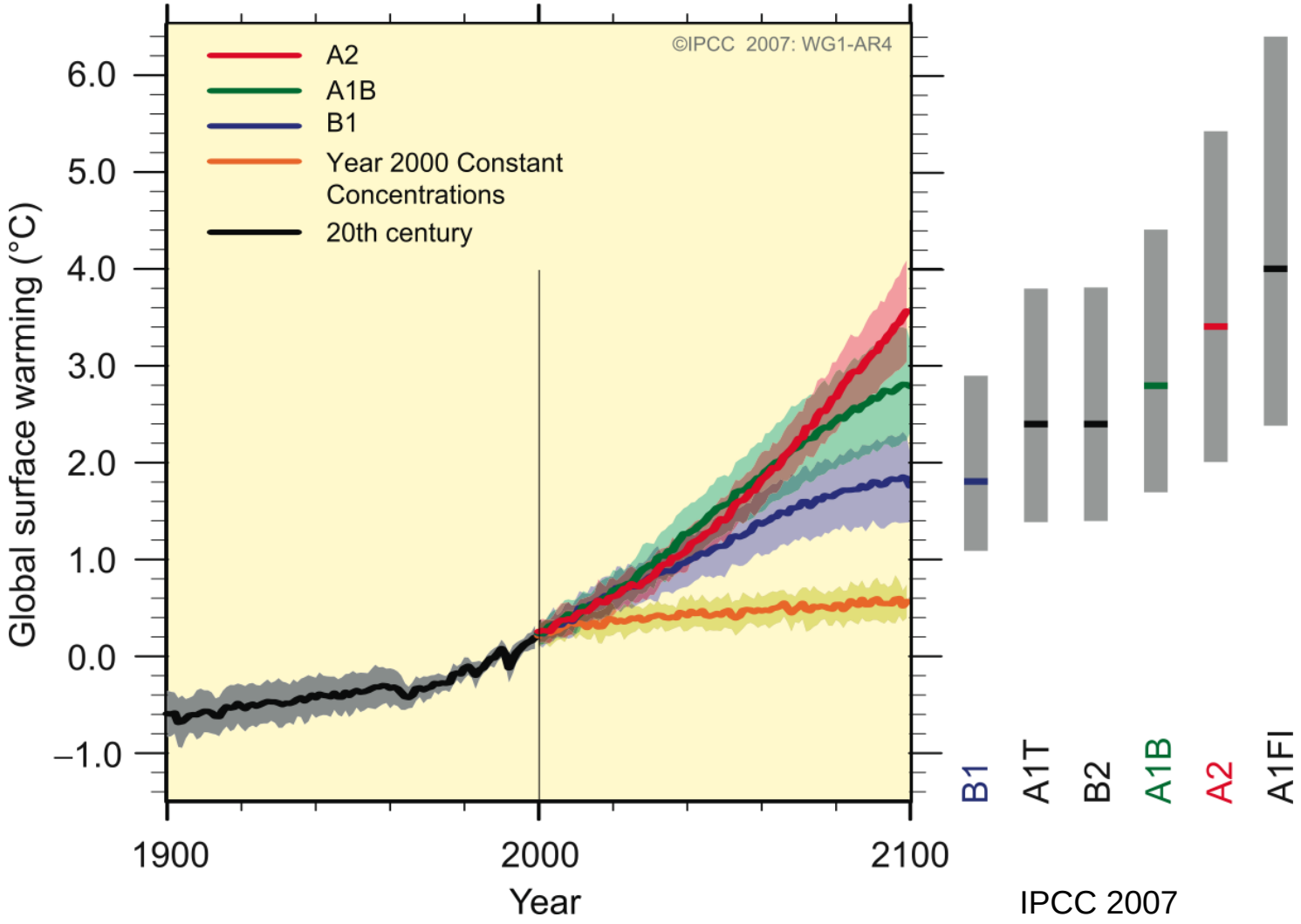
GIZ Winter School "REDD+ Governance"
Berlin, 12 January 2011

Prof. Dr. Ottmar Edenhofer

Overview

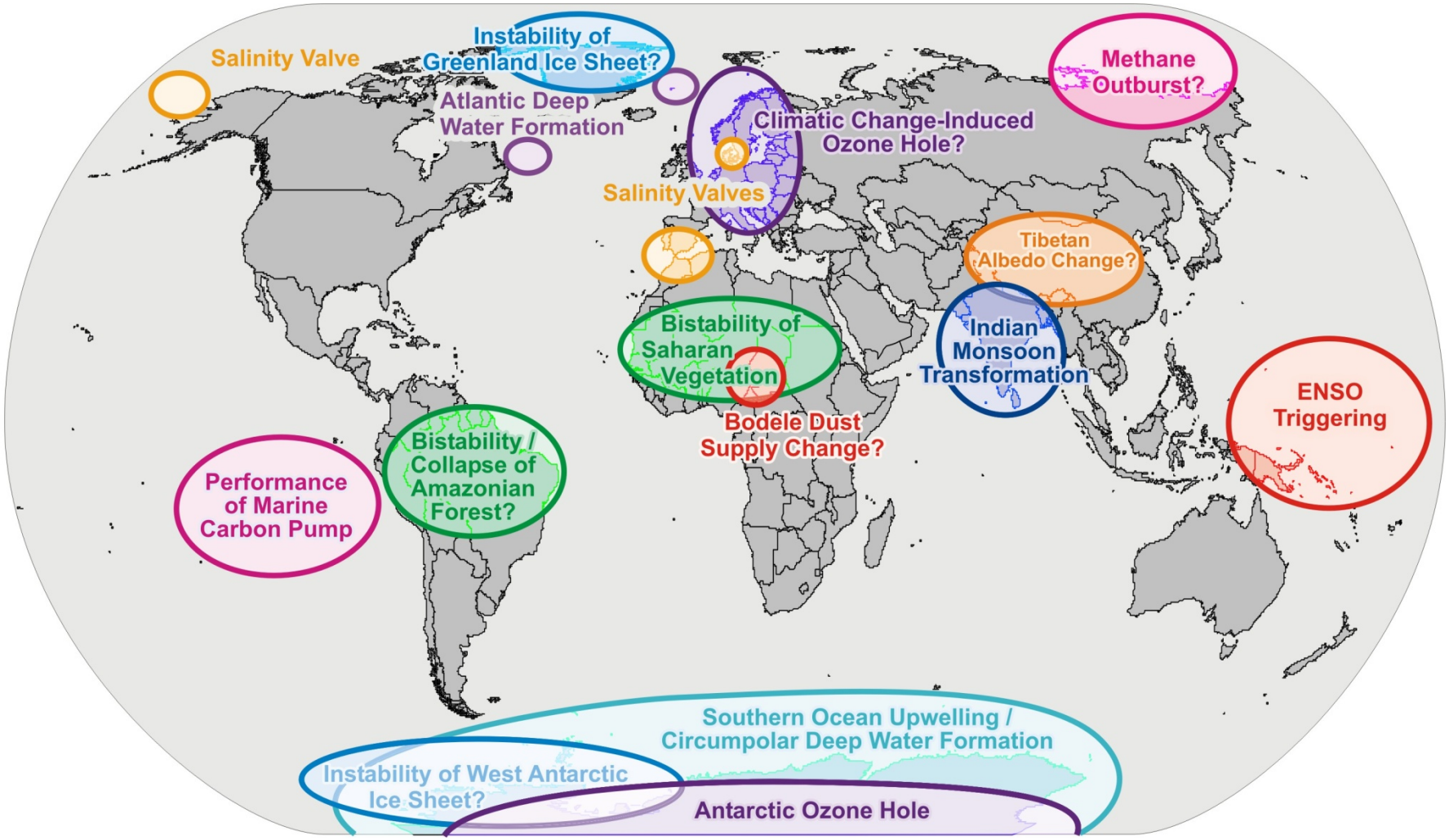
1. The issue of climate change from a global perspective
2. Political economy of international climate policy
3. Durban outcome
4. Outlook

What should we expect?



IPCC 2007

Tipping points in the earth-system



„Tipping-processes in the climate system“ are characterized by strong responses even to small temperature changes

PIK 2007

Climate mitigation as insurance

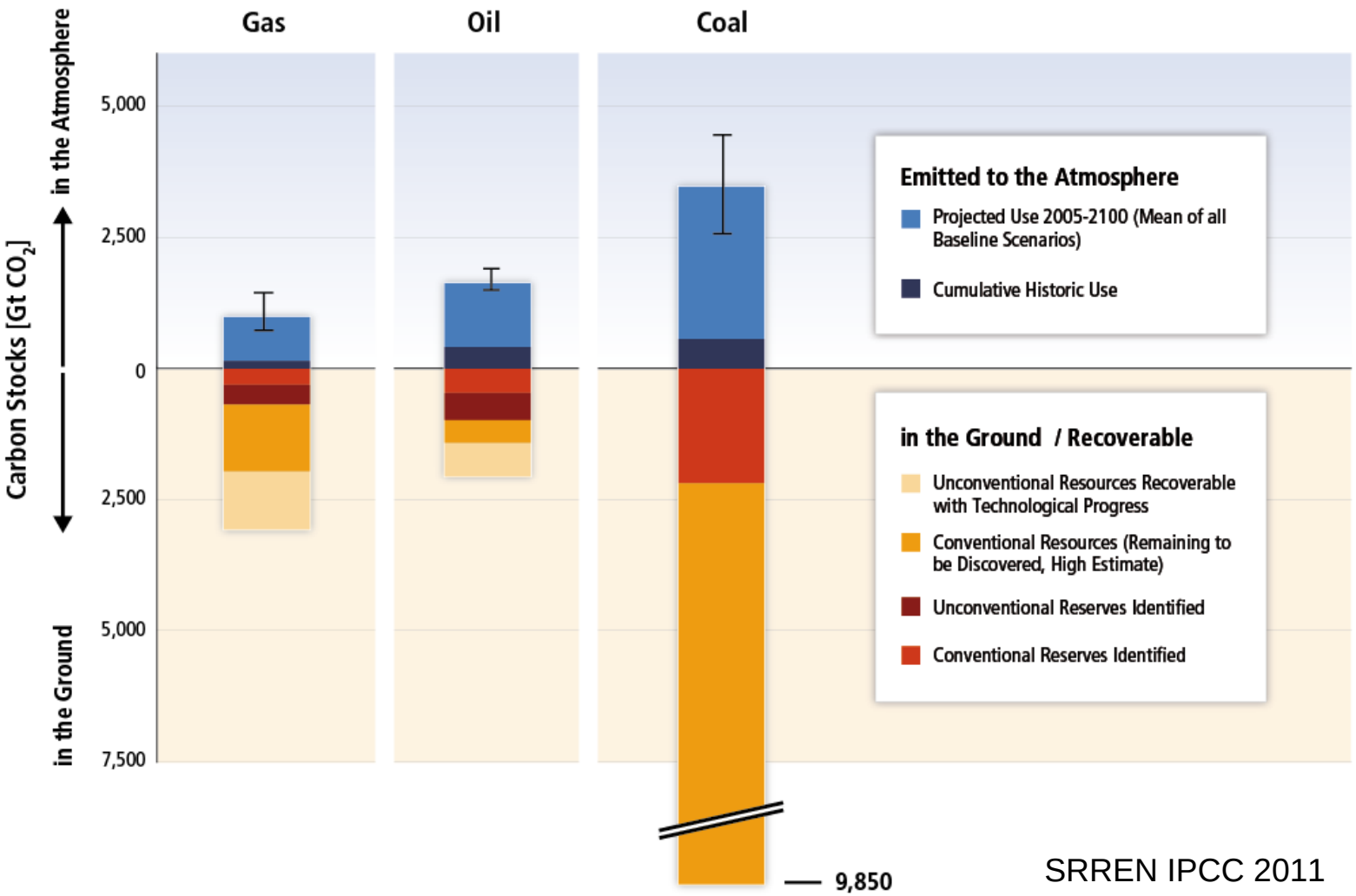
- Martin Weitzman (2009): With the possibility of ‚catastrophic climate damages' the conventional cost-benefit type of analysis does not work anymore, because risk-aversion implies that one would pay any price – e.g. entire income – in order to avoid the catastrophe.
- Climate policy as an **insurance against catastrophic climate change!**

Probability (in percent) to exceed given global temperature increase

Stabilization level in ppm CO_2-eq	2°C	3°C	4°C	5°C	6°C	7°C
450	78	18	3	1	0	0
500	96	44	11	3	1	0
550	99	69	24	7	2	1
650	100	94	58	24	9	4
750	100	99	82	47	22	9

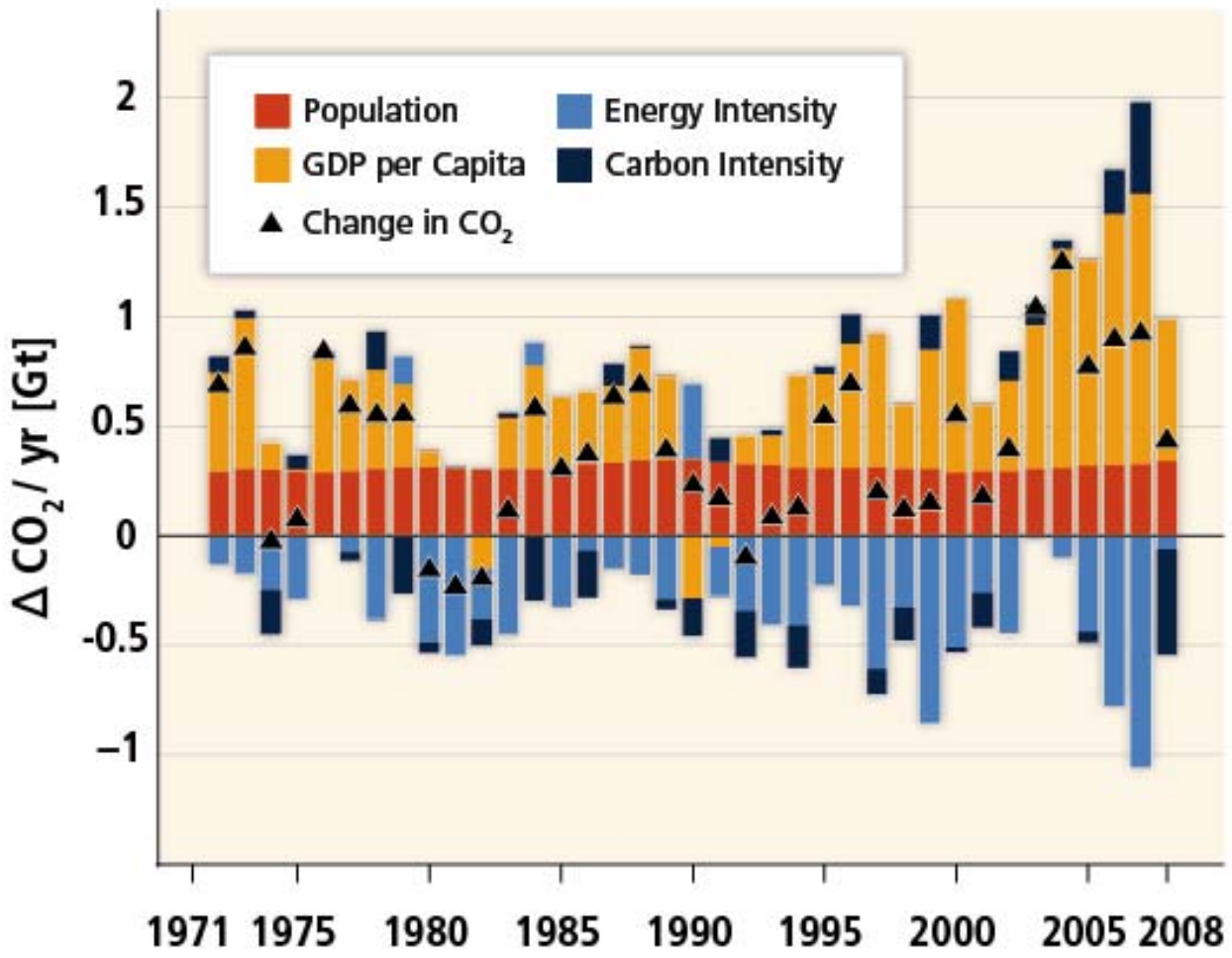
Stern 2008

Scarcity of fossil resources will not prevent climate change



SRREN IPCC 2011

We are not on the right track…



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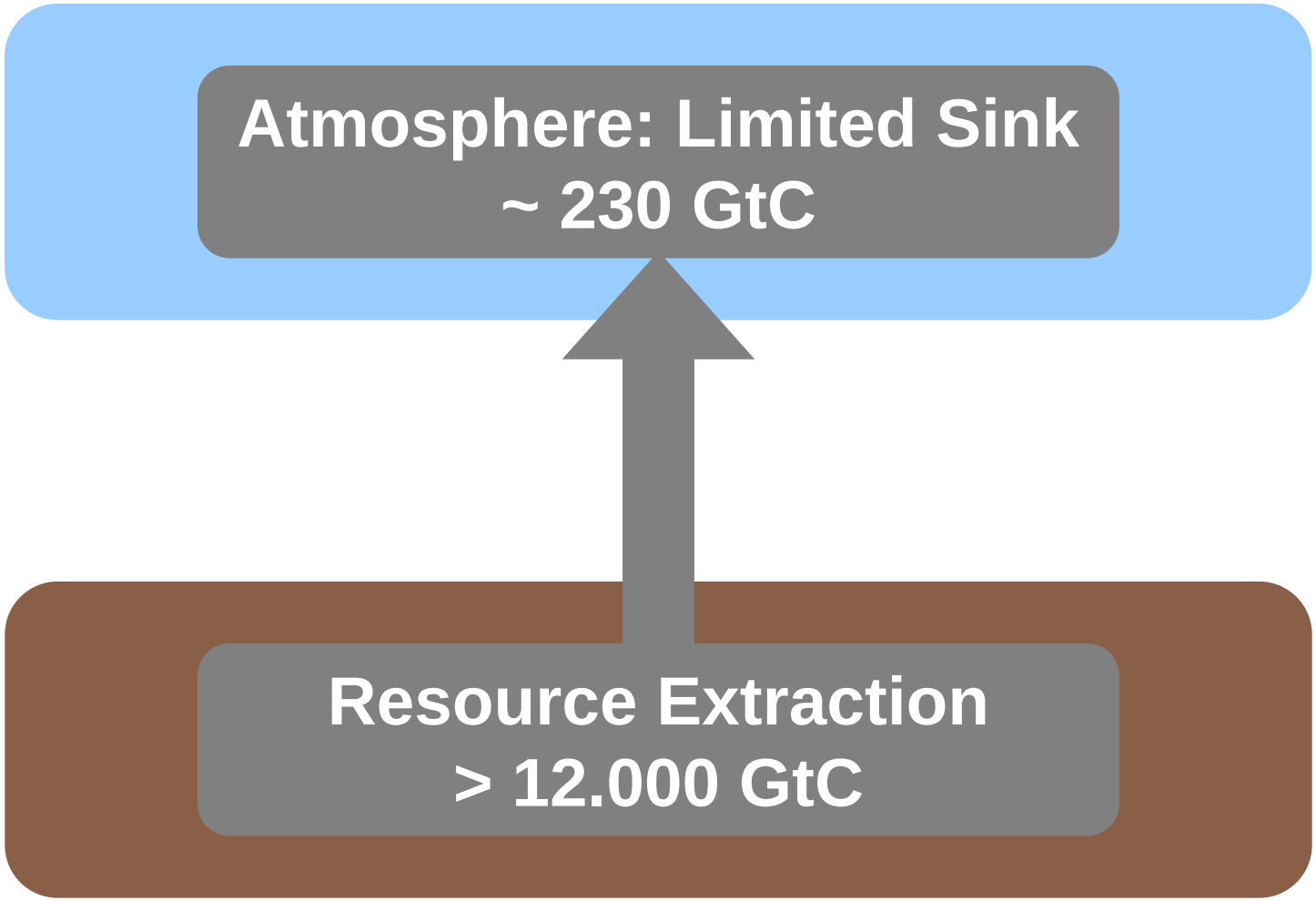
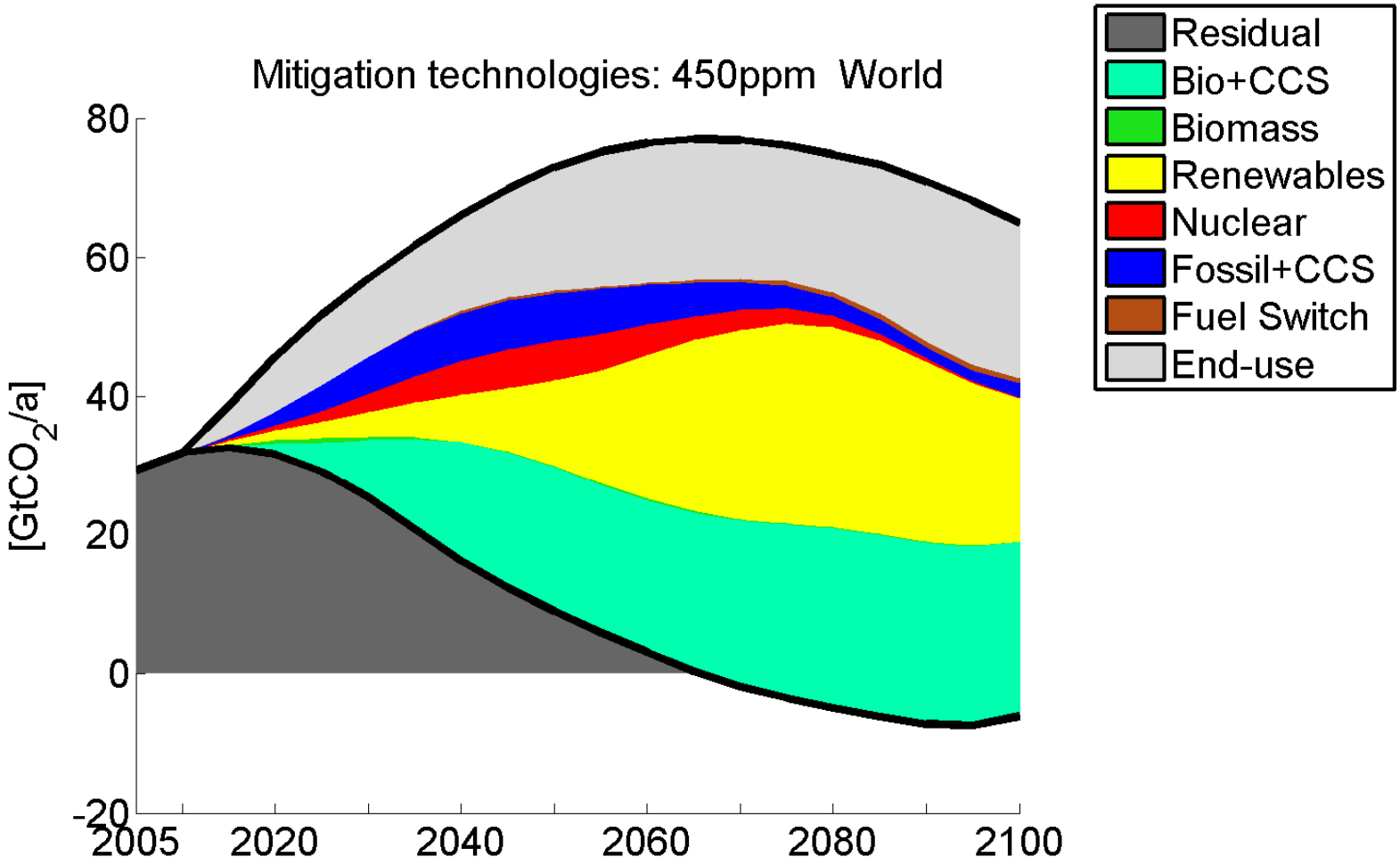
The Atmosphere as a Global Common



Is de-coupling possible?



Luderer et al. (2011)

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Global climate policy – a social dilemma

- Common sense and theory: Low prospects for international cooperation on climate change mitigation
  - abatement of emissions is a pure public good

- free-riding incentives inhibit cooperation, especially when there is much to gain from it (Carraro & Siniscalco 1993, Barrett 1994)

Copenhagen Pledges – policy with a ‚Klingelbeutel‘

Pledged reduction targets for 2020:

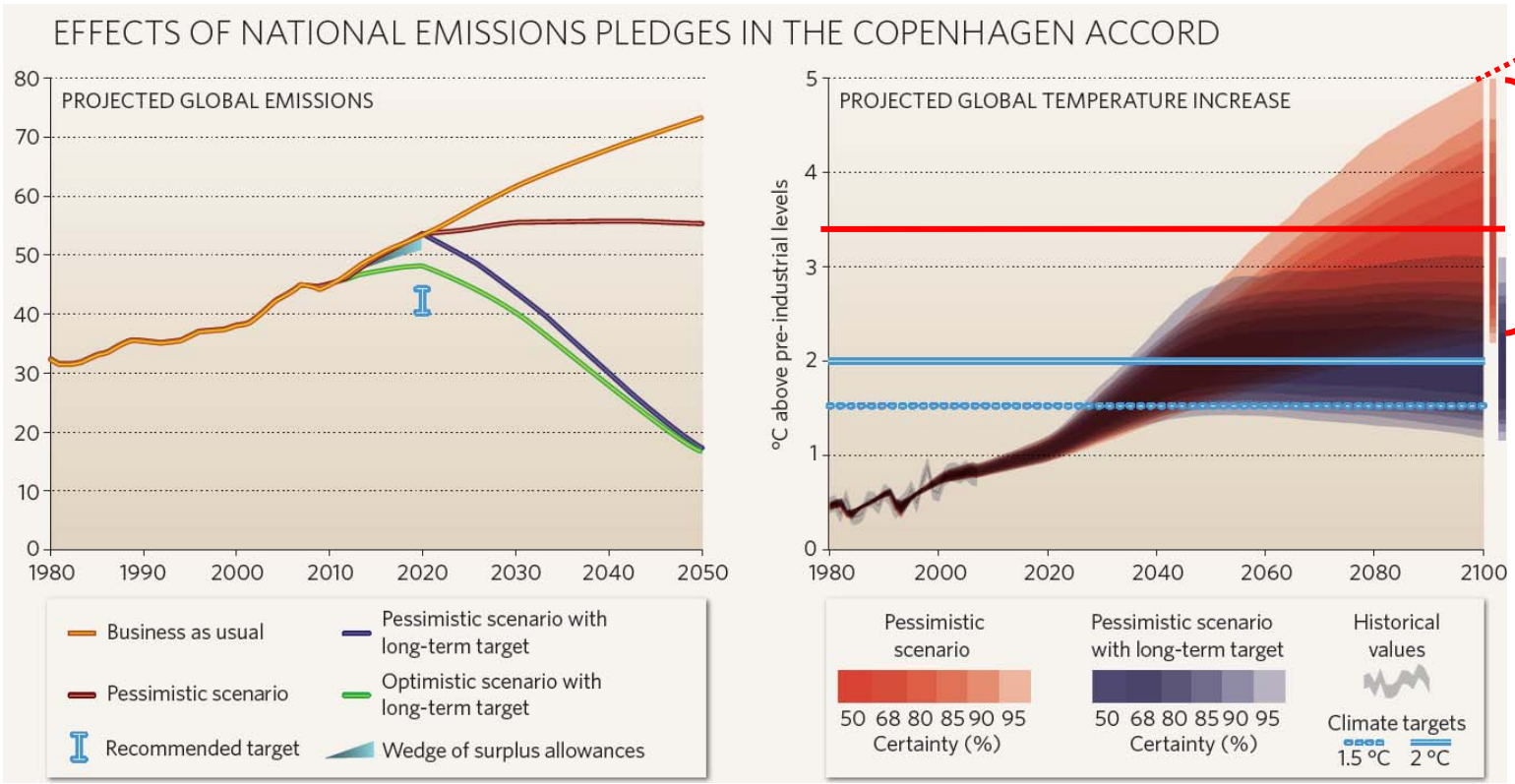
- Japan: 25% wrt 1990
- EU: 20-30% wrt 1990
- USA: 17% wrt 2005
- Canada: 17% wrt 2005

➡ Implementation of the minimal Copenhagen targets means that emissions in 2020 will be 10-20% higher than today

➡ Copenhagen implications for 2050: high probability for exceeding 2˚C warming target, 50% chance for exceeding 3˚C

Rogelj et al. 2010, *Nature*

Copenhagen Pledges – insufficient for 2˚C



?

„Copenhagen forever“

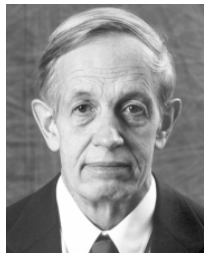
Rogelj et al. 2010, *Nature*

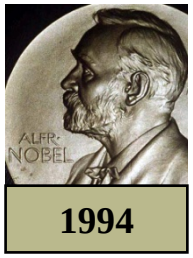
Searching for economic explanations: game theory

- *Game theory*:
  Analysis of strategic behavior in situations of conflict

- Equilibrium-state according to John Nash:
  Everybody chooses the strategy (=behavior) that is most advantageous for him/herself – given the behavior of everybody else

⇒ Incentives in the „climate-game“ correspond to famous *prisoners dilemma*

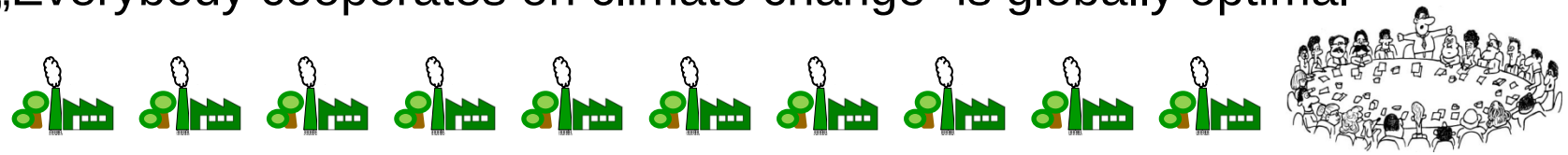




John F. Nash *1928,
Nobel prize in 1994

Searching for economic explanations: game theory

- Dilemma: Incentives in the „climate-game“
  - „Everybody cooperates on climate change“ is globally optimal



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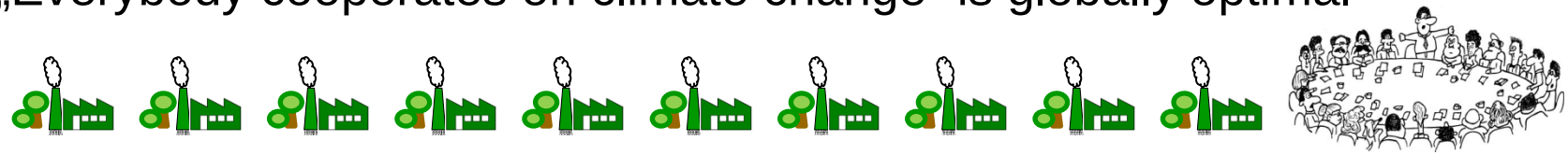

  - Every single country is better off if only the others mitigate

Searching for economic explanations: game theory

- Dilemma: Incentives in the „climate-game“
  - „Everybody cooperates on climate change“ is globally optimal

  - Every single country is better off if only the others mitigate

  - „No climate mitigation“ is the globally least-desirable state

Searching for economic explanations: game theory

- Dilemma: Incentives in the „climate-game“
  - „Everybody cooperates on climate change“ is globally optimal

  - Every single country is better off if only the others mitigate

  - „No climate mitigation“ is the globally least-desirable state

Nash Equi-librium

- **Is it possible to modify the incentive structure?**

From Tragedy to Drama: Strategic Options

Country Calculus for Mitigation Program

	Benefits	Costs
Domestic	Avoided domestic damages & Co-Benefits	Domestic mitigation costs (energy, growth)
Global	Avoided damages in other regions (ethics)	Costs for other regions (ethics); Access to mitigation in other regions

Demand for Mitigation

Supply of Mitigation

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Durban outcome

1. Ad Hoc Working Group on the Durban Platform for Enhanced Action (AWG-DPEA)
   - *“develop a protocol, another legal instrument or an agreed outcome with legal force under the UNFCCC applicable to all Parties”*
   - negotiation until 2015 / COP 21
   - implementation from 2020 onwards

2. Kyoto 2nd commitment period
   - agreement on length (2017 or 2020?) and ambition (targets for signatories) postponed → COP 18 in Qatar

3. “Operationalization” of Cancun Agreements
   - Establishment of Green Climate Fund

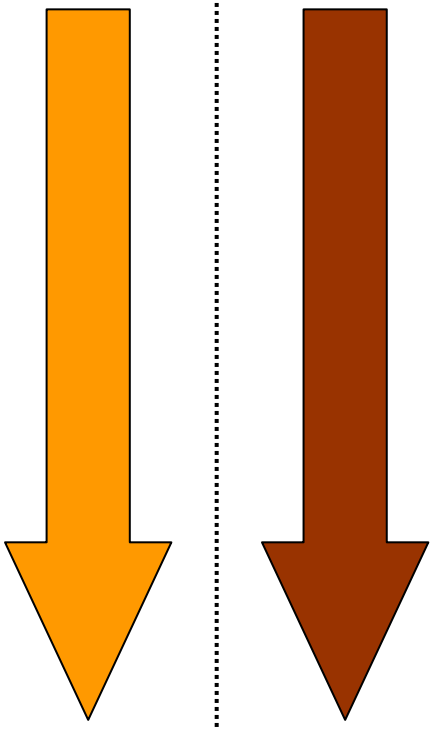
Phase-out of developed/developing differentiation

Durban

AWG-KP

2nd commitment period under Kyoto

likely participants:
EU, Norway, Switzerland

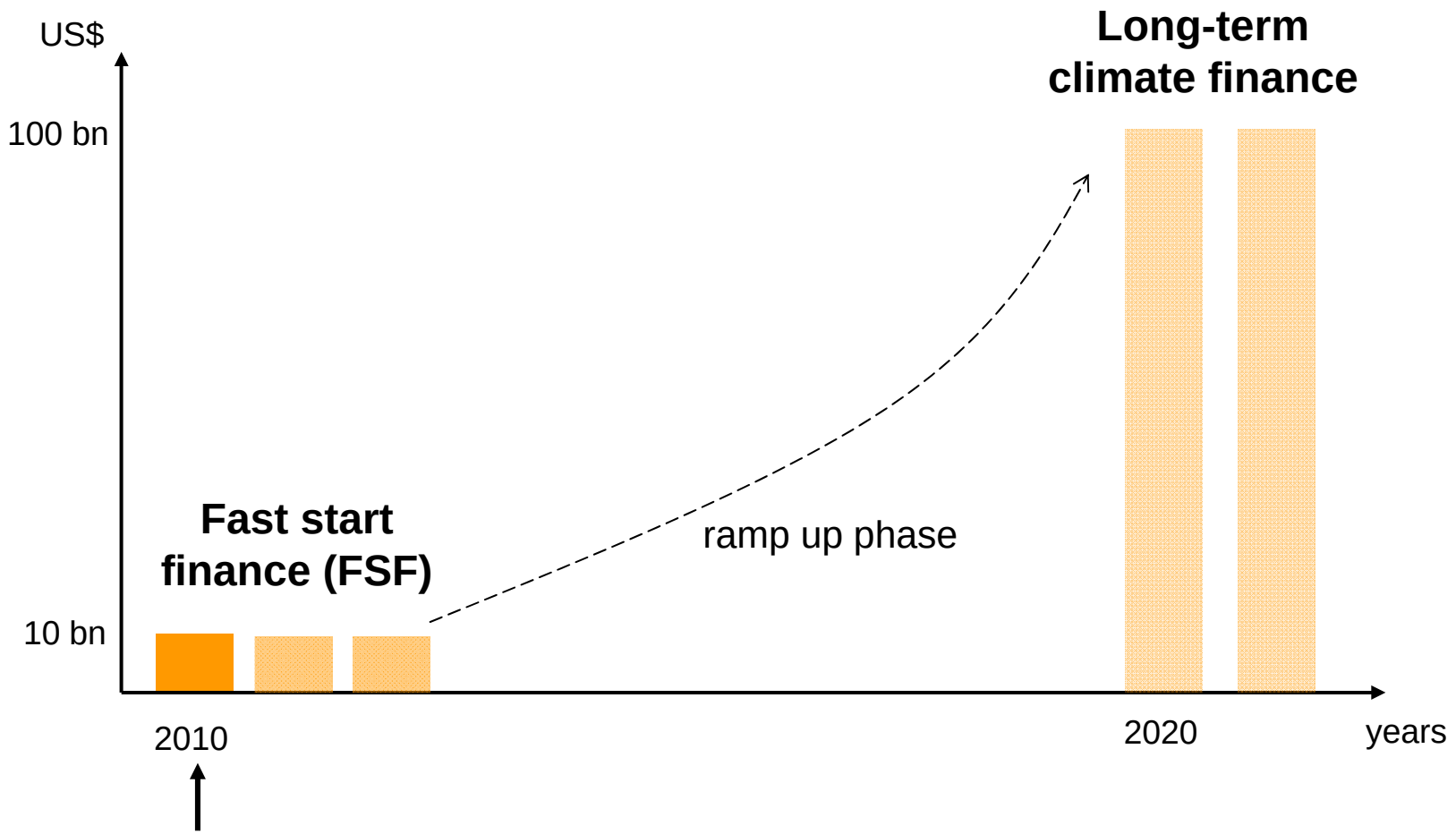


AWG-LCA (until 2012) and then AWG-DPEA

by 2015, prepare
“outcome with legal force”
and “applicable to all Parties”

2020 International Agreement
for both developed & developing countries

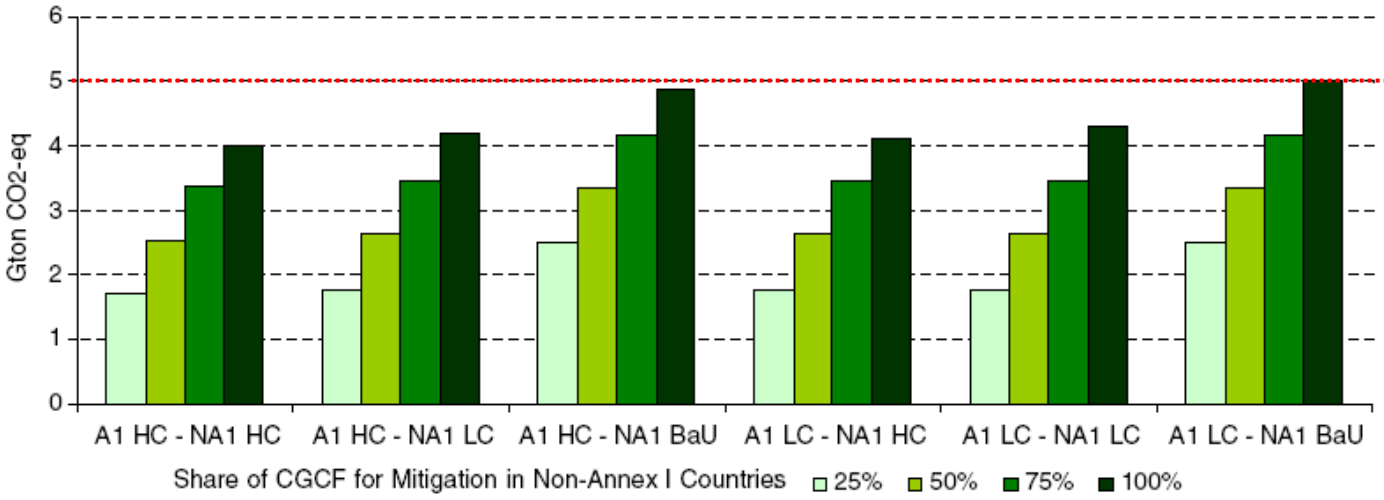
Operationalization of Green Climate Fund



For 2010 industrialized countries have earmarked US$ 12 billions (Source: WRI 2011)

Green Climate Fund

- Allocation of money between mitigation and adaptation still completely open
- If used overly (and efficiently) for mitigation, 2˚C target could again come within reach (Carraro/Massetti 2011)



up to 5Gt CO_2-eq.

Green Climate Fund

Funding

- Auctioning of emission allowances
- Levy on air and maritime transport
- Investments from private sector

?

Governance

- Institutional structure still unclear
- UNFCCC vs. World Bank under discussion
- „Access“ and „Ownership“: who will decide over allocation of funds?

Still unclear!

Deployment

?

- Transformation of the energy system (e.g. NAMAs)
- Avoiding deforestation (REDD+)
- Technology transfer
- Adaptation

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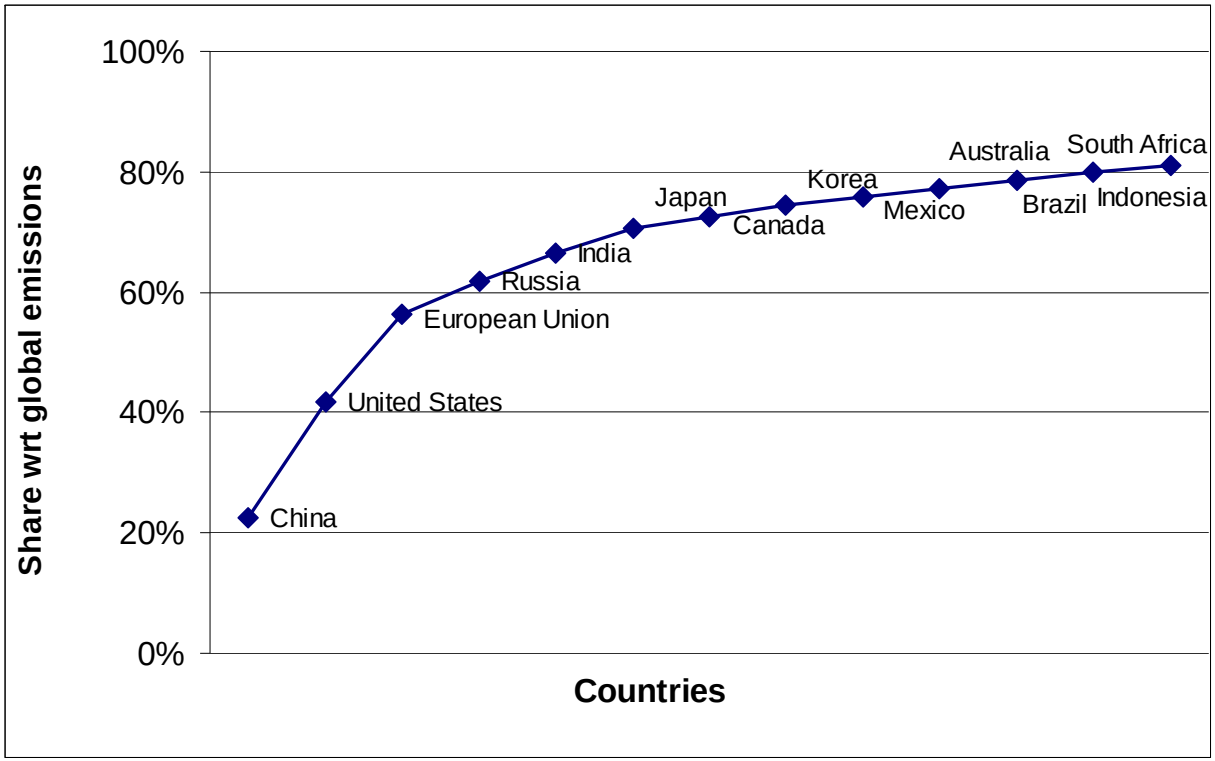
   I. Less players: ‚Major Economies' approach
   II. More issues: ‚Issue-Linking'
   III. Strategies not focusing on emission reductions

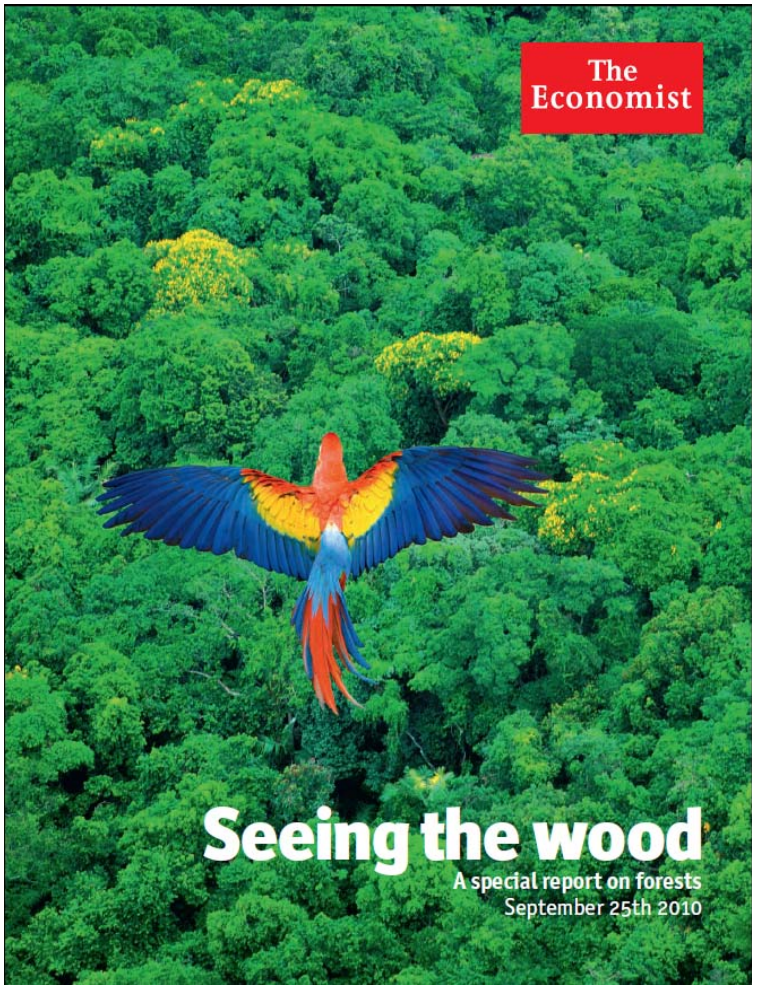
I. Less players: ‚Major Economies' approach

Cumulative emissions of countries in the *Major Economies Forum on Energy and Climate* (MEF). [Year 2008. Only CO_2, without LULUCF emissions]



- Reducing the complexity of negotiation process
- ... but at the price of cost-effectiveness

Cancun - Better REDD than dead?



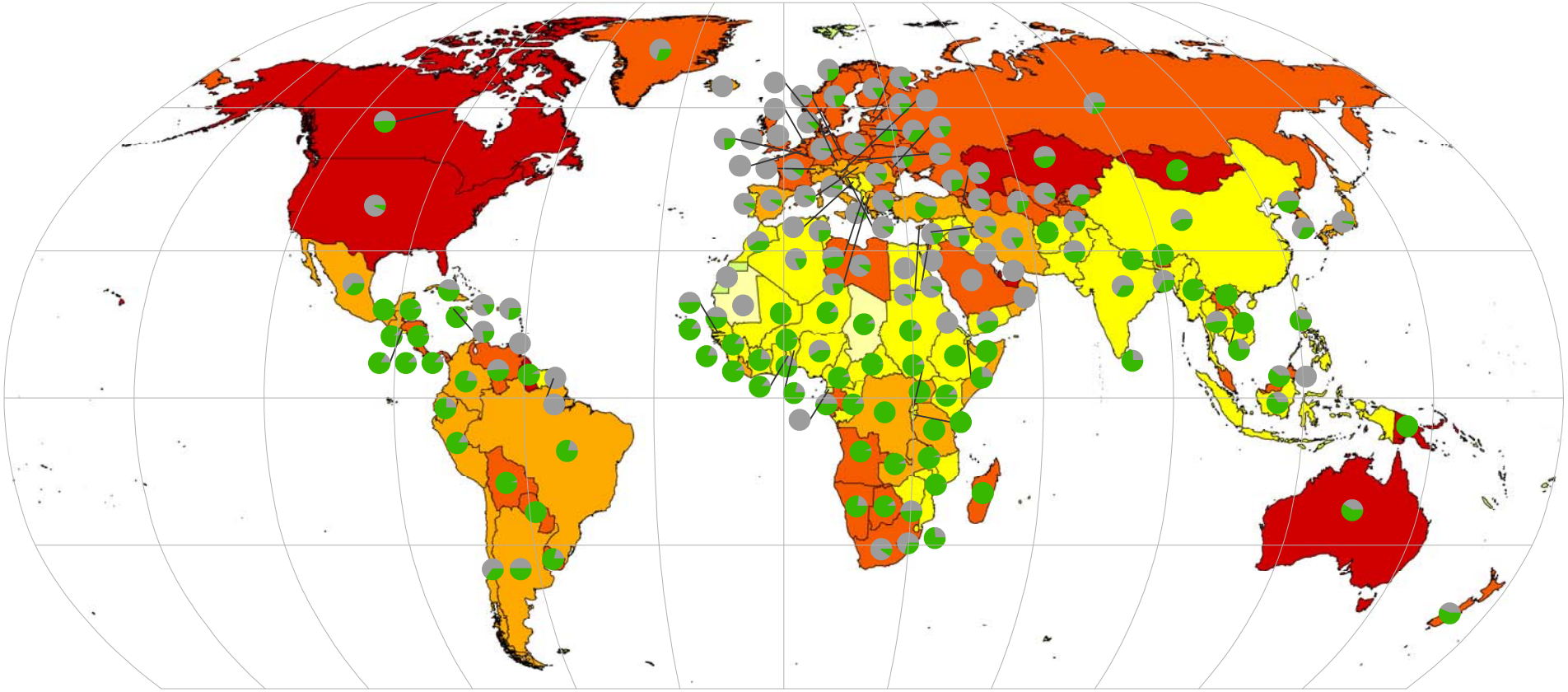
Durban outcome regarding REDD+

- Final decision on (long-term) financing of REDD+ postponed to 2012
- Explicit link with adaptation, poverty and biodiversity objectives
- Clearer conditionalities on long term finance (safeguards, MRV)
- Consensus on reference levels
- Social and environmental safeguards reporting watered down

→ Mixed outcome for REDD+

Reducing Deforestation: Fossil vs. LUCF CO_2 Emissions

CO_2 emissions per person and year, 1950 - 2003



CO_2 emissions from fossil fuel combustion and cement production, and including land use change (kg C per person and year from 1950 - 2003)

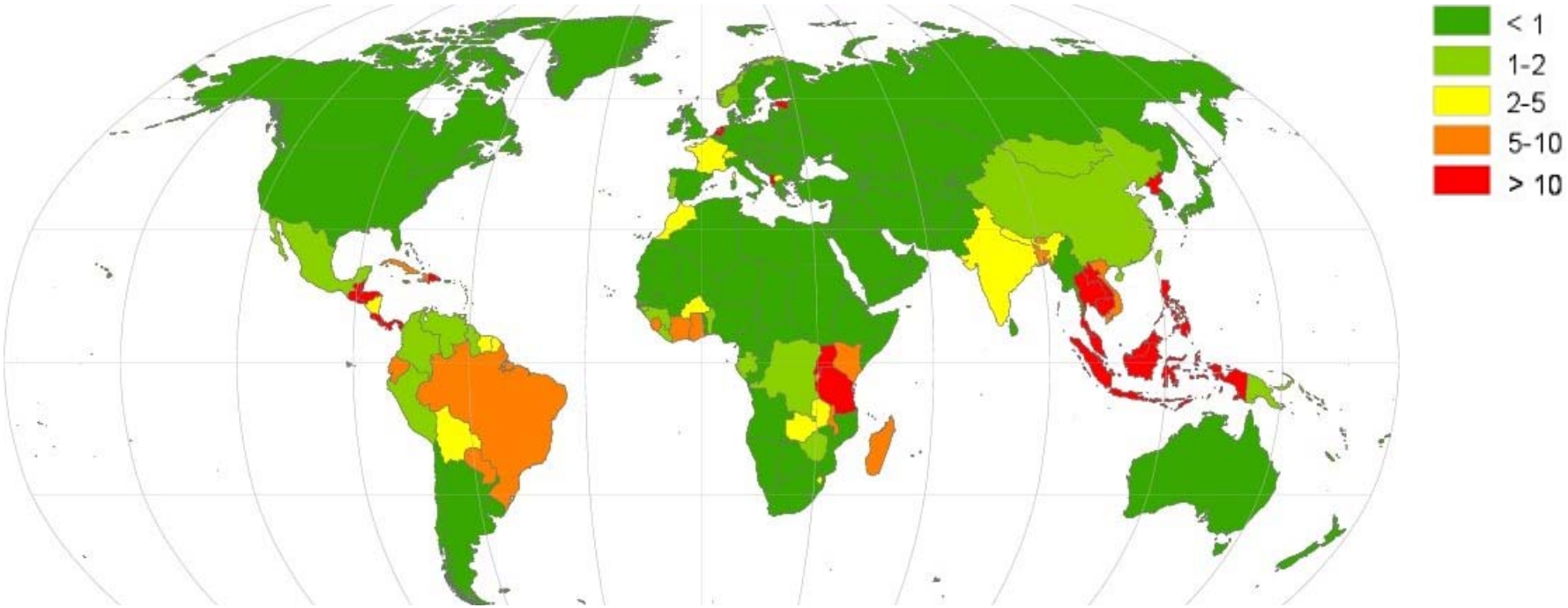
-1000 - 0
0 - 100
100 - 1000
1000 - 2000
2000 - 5000
5000 - 15000

Ratio

Emissions per year from fossil fuel combustion and cement production

Emissions per year from land use change

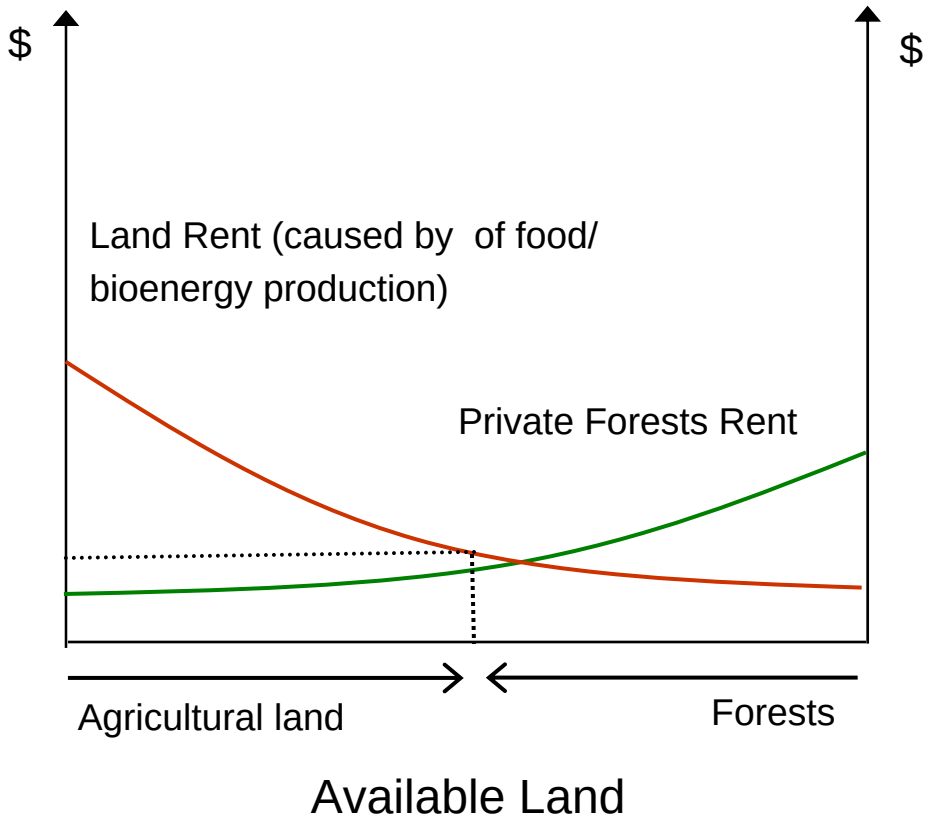
Global Deforestation



Loss of biomass (carbon) due to land use change (mostly deforestation), 1998-2003 average in g C/m2 per annum

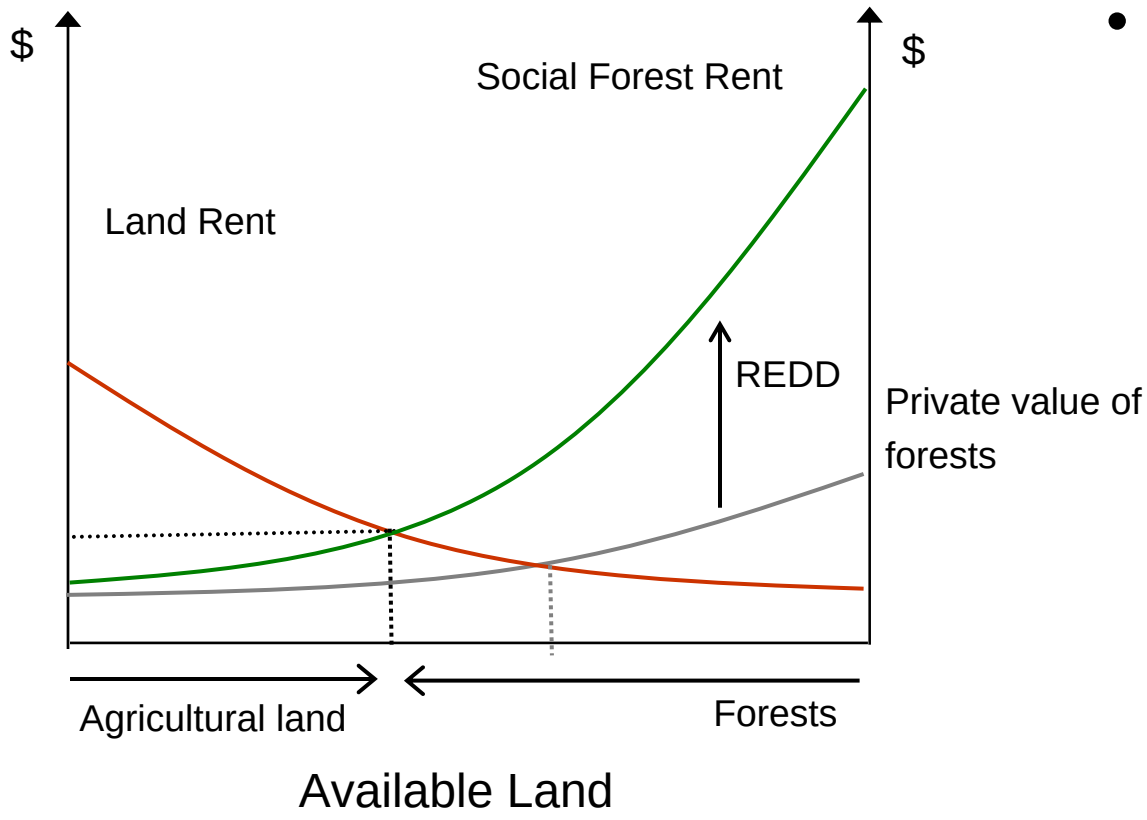
Vohland et al. 2008

Agriculture versus Forest Protection



- Agriculture and forest protection compete for scarce land
- Optimal allocation of available land

Agriculture versus Forest Protection



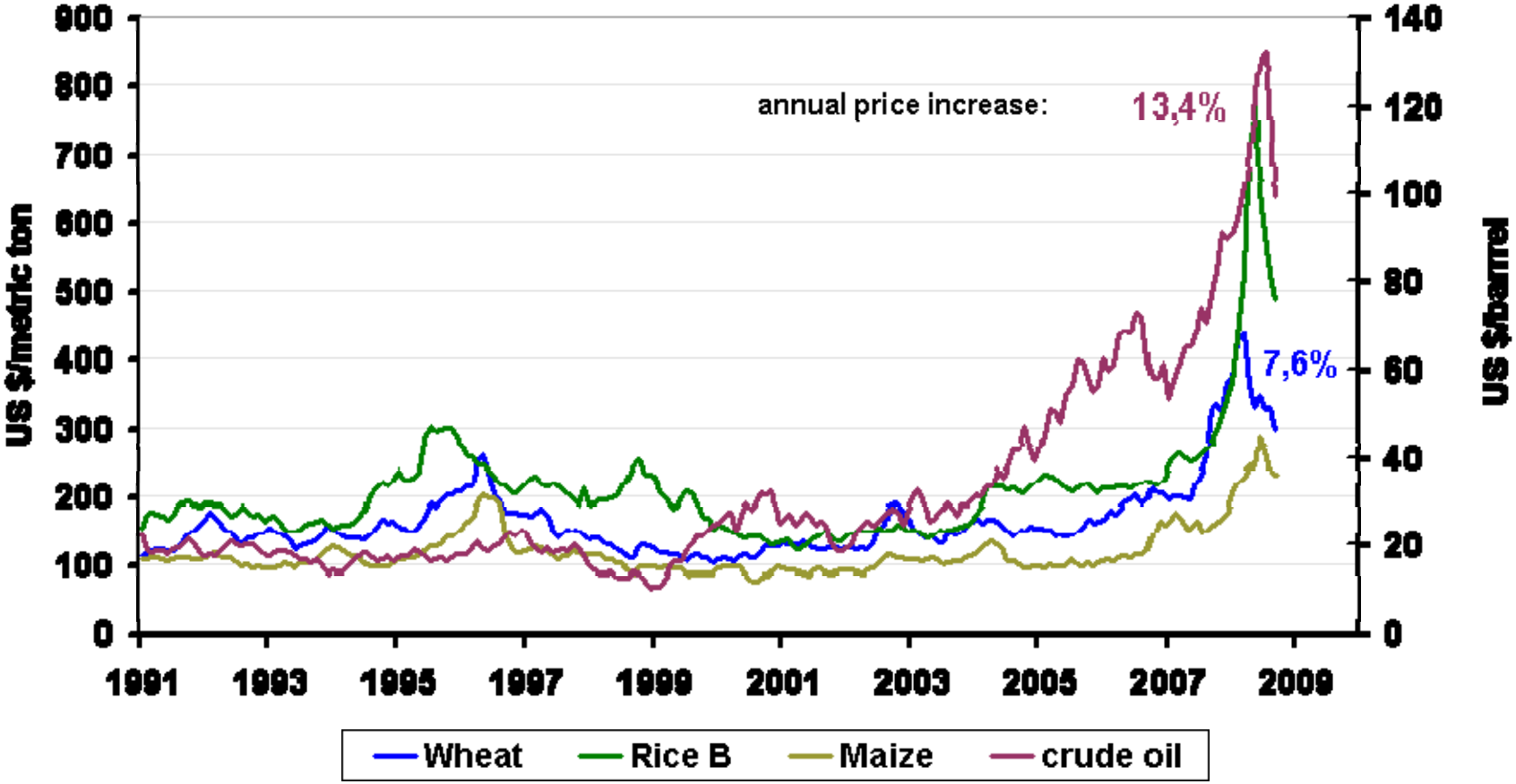
- REDD protects forests

Supposed Effects (I)

However, even an emission trading scheme would only count the carbon storage capacity.

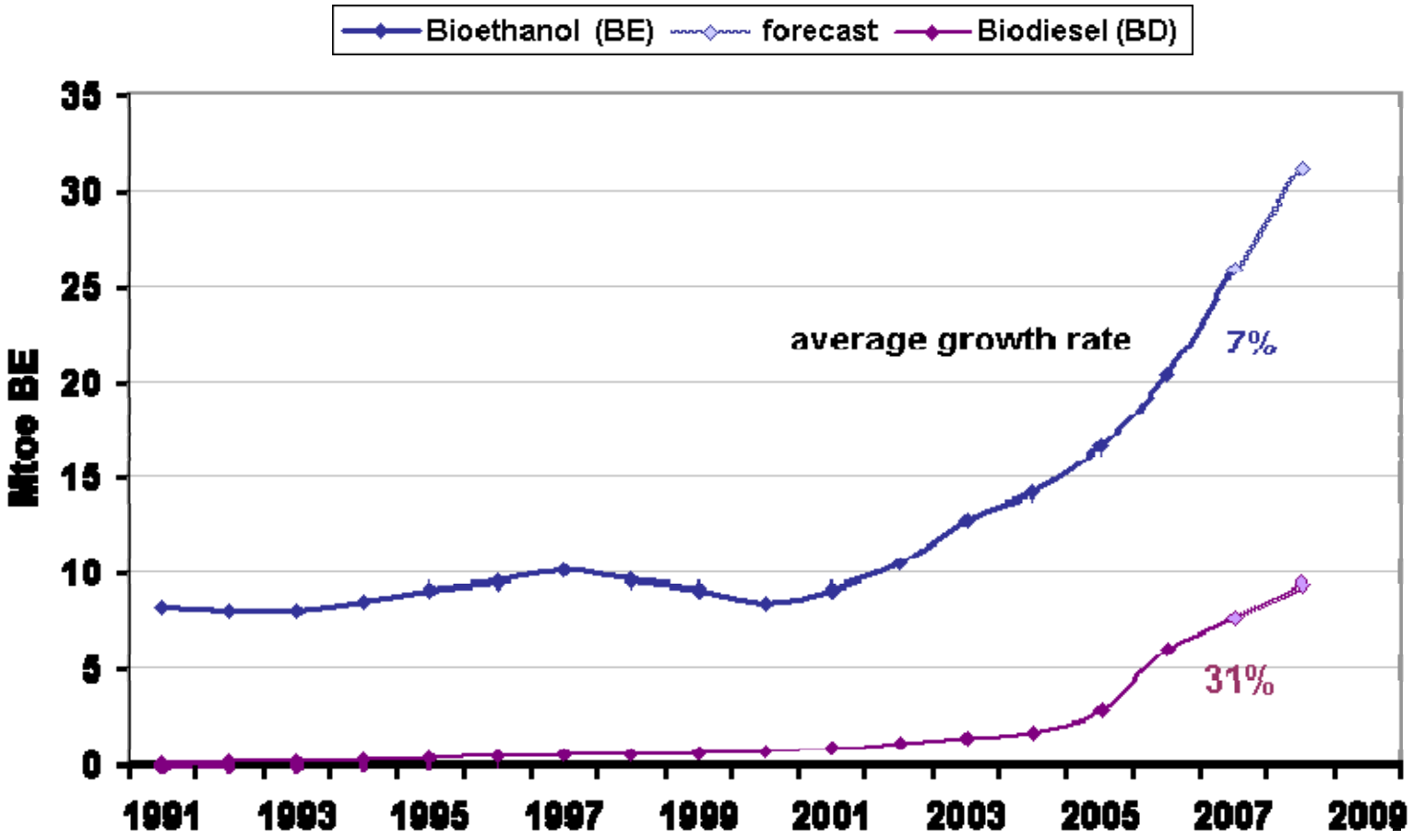
In an ETS, forests would compete with other carbon storage technologies like CCS, Biomass+CCS. The ecosystem services have to be compensated otherwise.

Market Prices for staple foods and crude oil
monthly averages 1991 - 2008



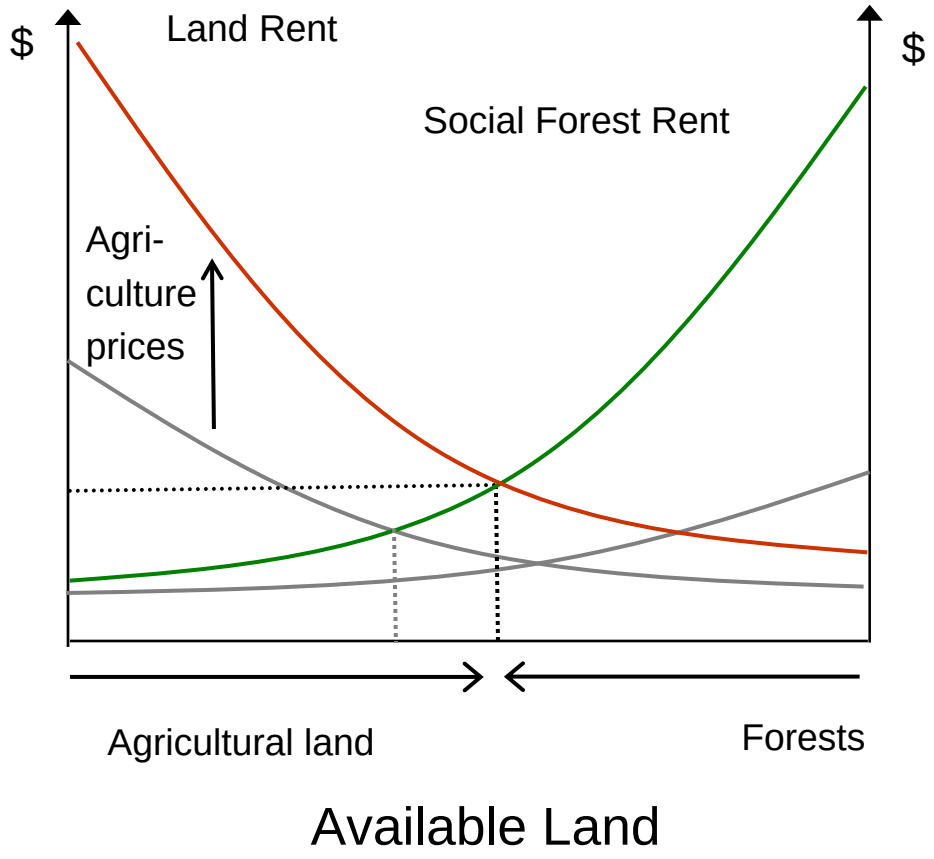
IMF; FAO International Commodity Prices

Annual World Biofuel Production 1991 - 2008



BP Statistical Energy Review; WRI

Agriculture versus Forest Protection



- Rising demand for agricultural products (oil price, food, bioenergy) counters the effect of REDD programs
- Higher prices for forest protection!

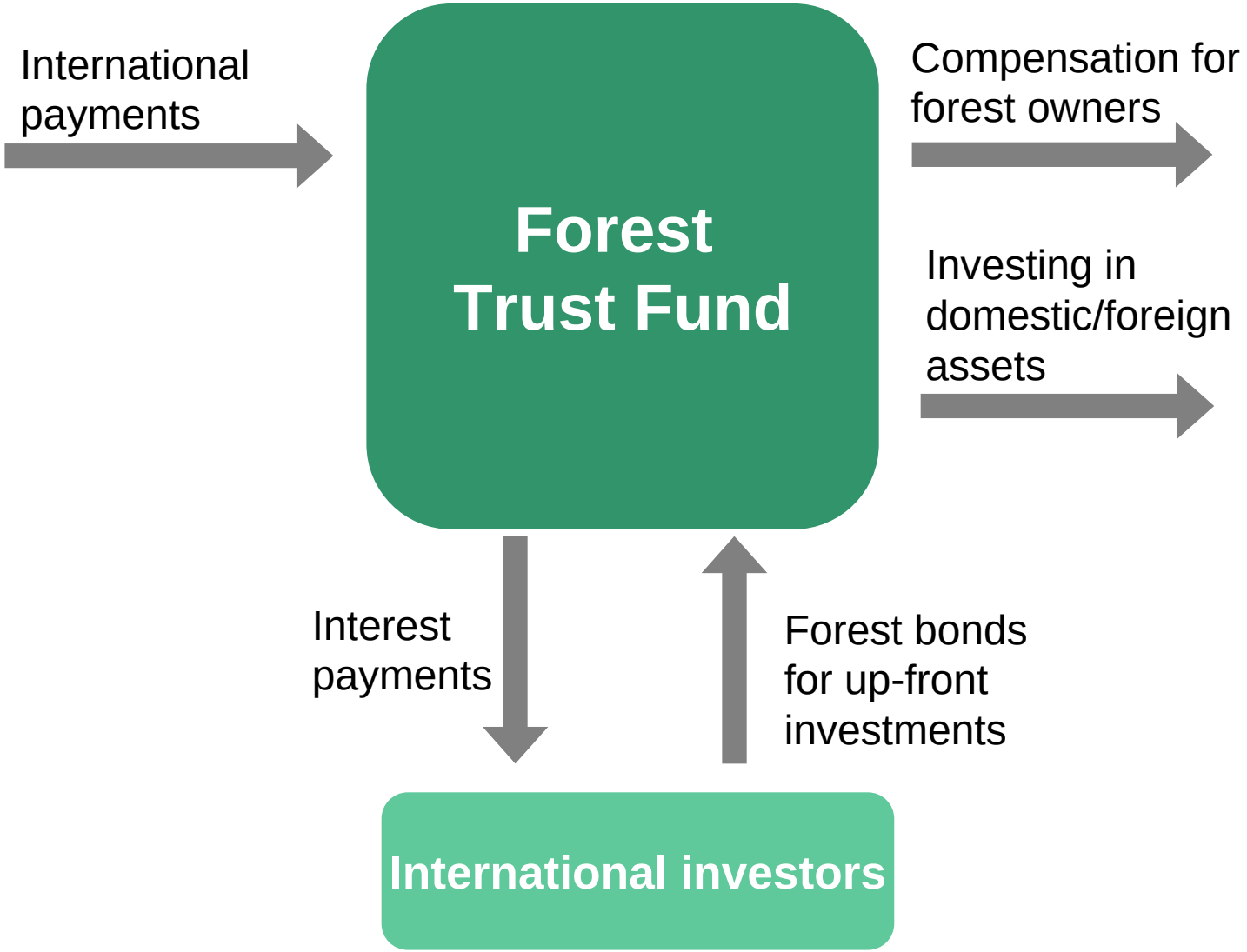
Supposed Effects (II)

Costs of REDD are underestimated

Proposed solutions would have to stabilize price on a high level to compensate the effects of rising oil prices. This is politically unlikely.

Credits for avoided deforestation should not be calculated from hypothetical baselines but from the carbon storage capacity of forests and other ecosystem services.

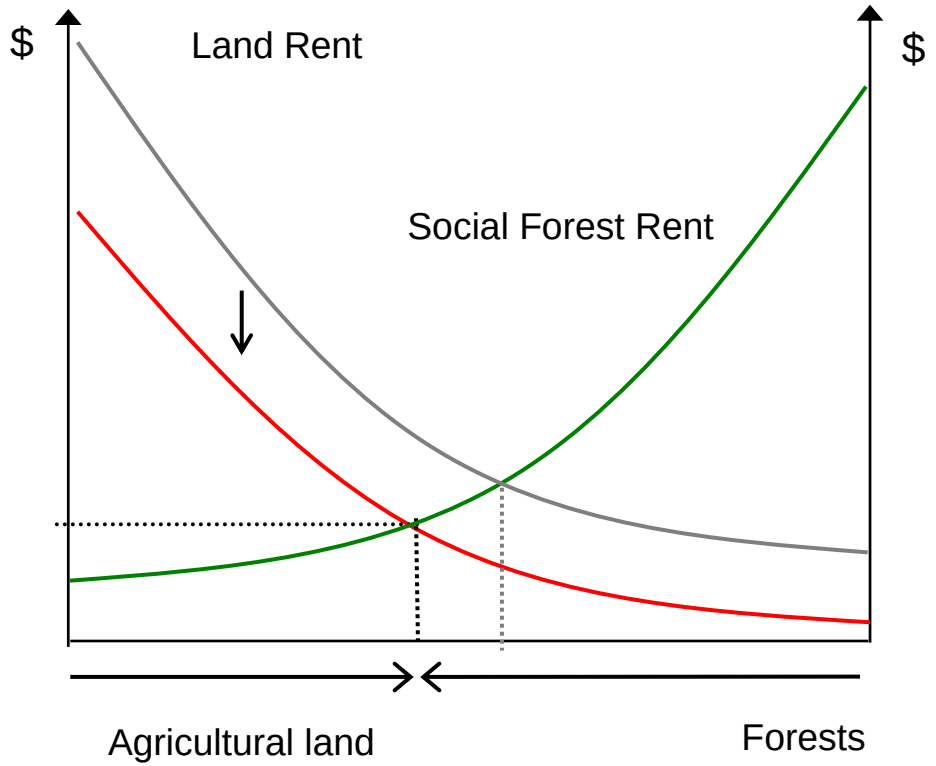
How a Forest Trust Fund could be designed



Drawbacks of such a trust fund solution

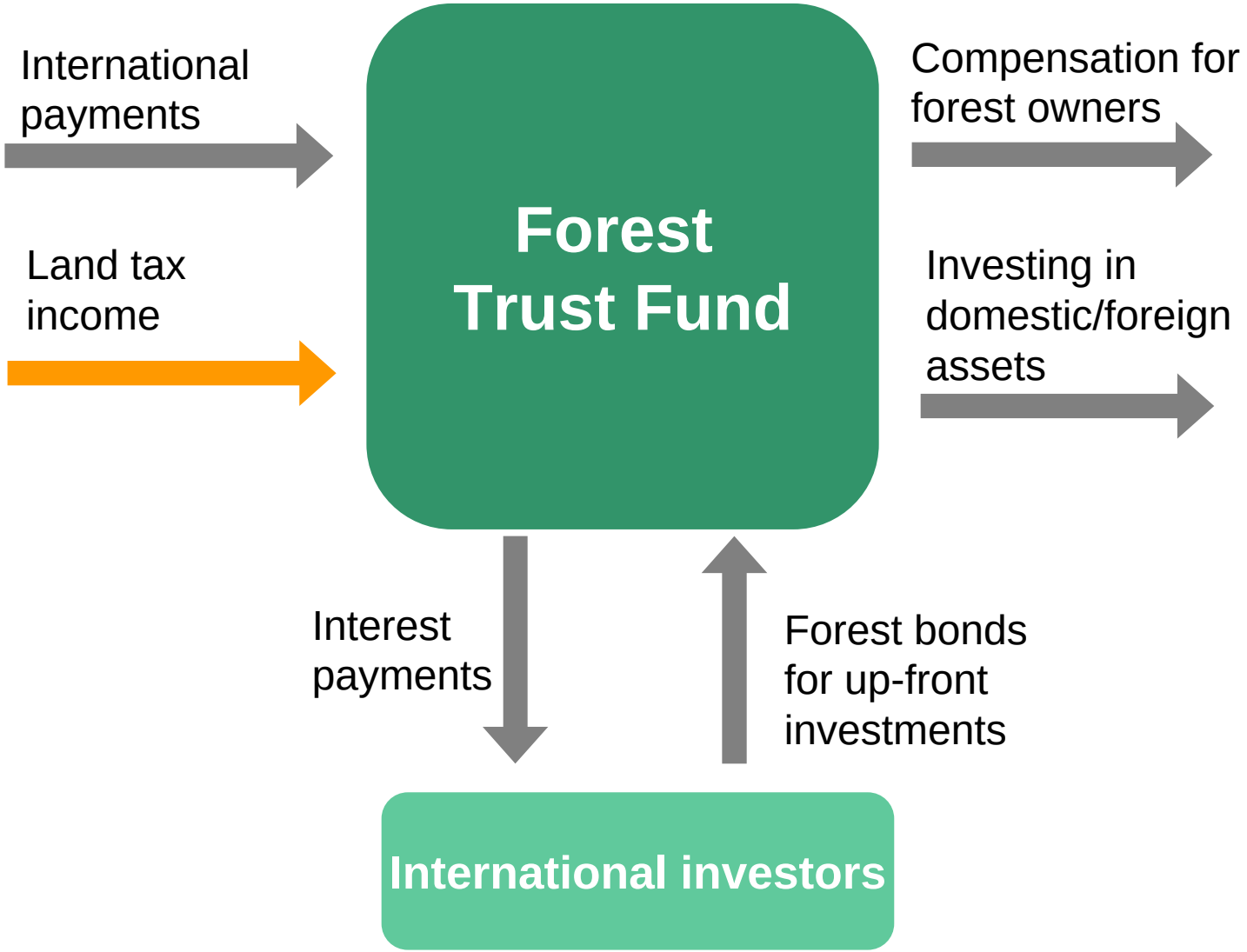
- Subsidizing land owners because of increasing land rents
- Oil price development is not automatically internalized
- How to solve the problem: land taxation

Forest Trust Fund and Land Taxation



Land taxation can compensate the increase of opportunity costs

Forest Trust Fund improved



Pitfalls of the land taxation solution

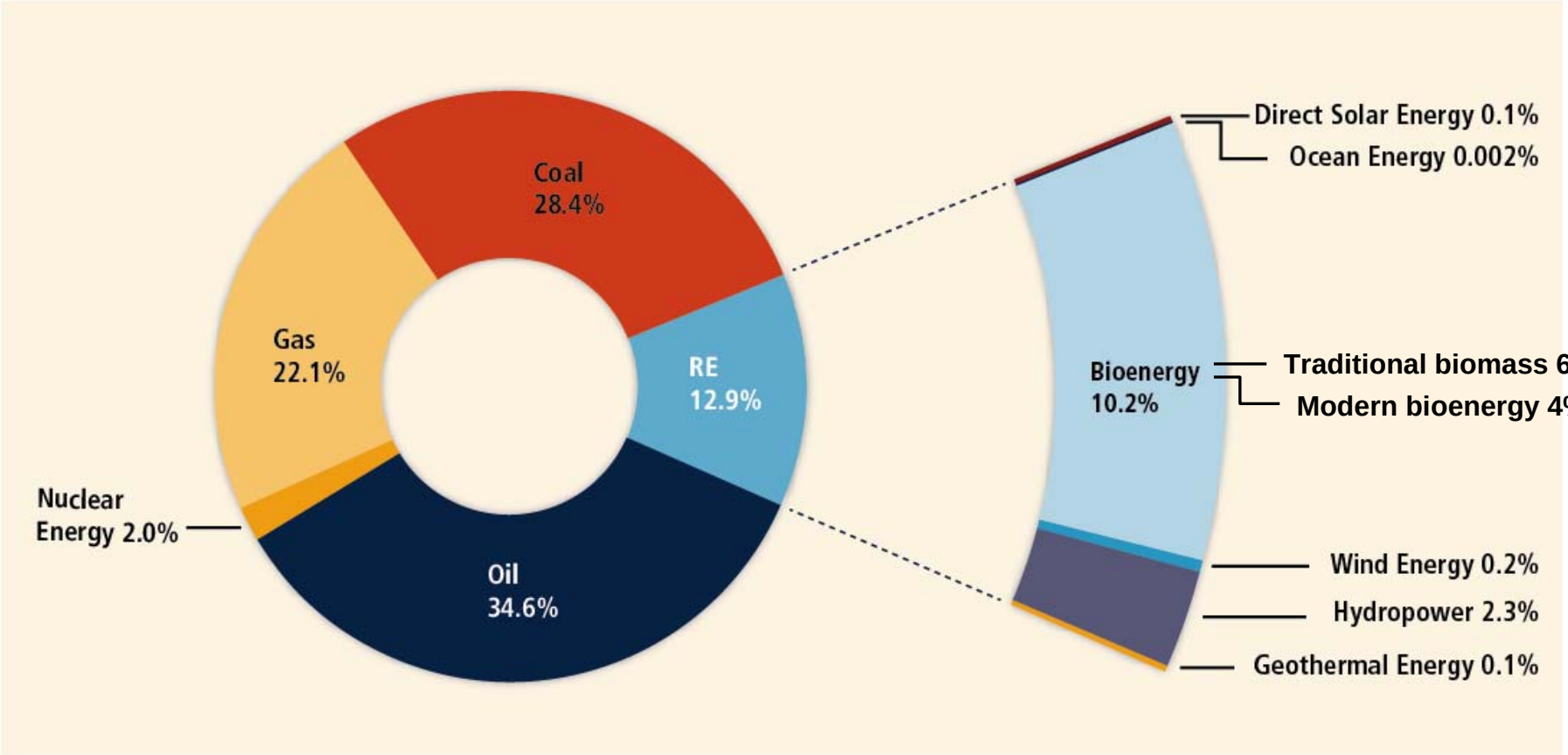
- Land taxation hard to implement
- Leakage because of increasing timber prices
- International payments would have to adjust to oil, biofuel, and timber prices

II. More issues: ‚Issue-Linking‘

Idea: Find mechanism to make cost-benefit ratio of climate mitigation (from individual country perspective) more attractive

- Link climate cooperation with R&D cooperation
- Create and link emission trading markets
- Trade sanctions against climate free-riders

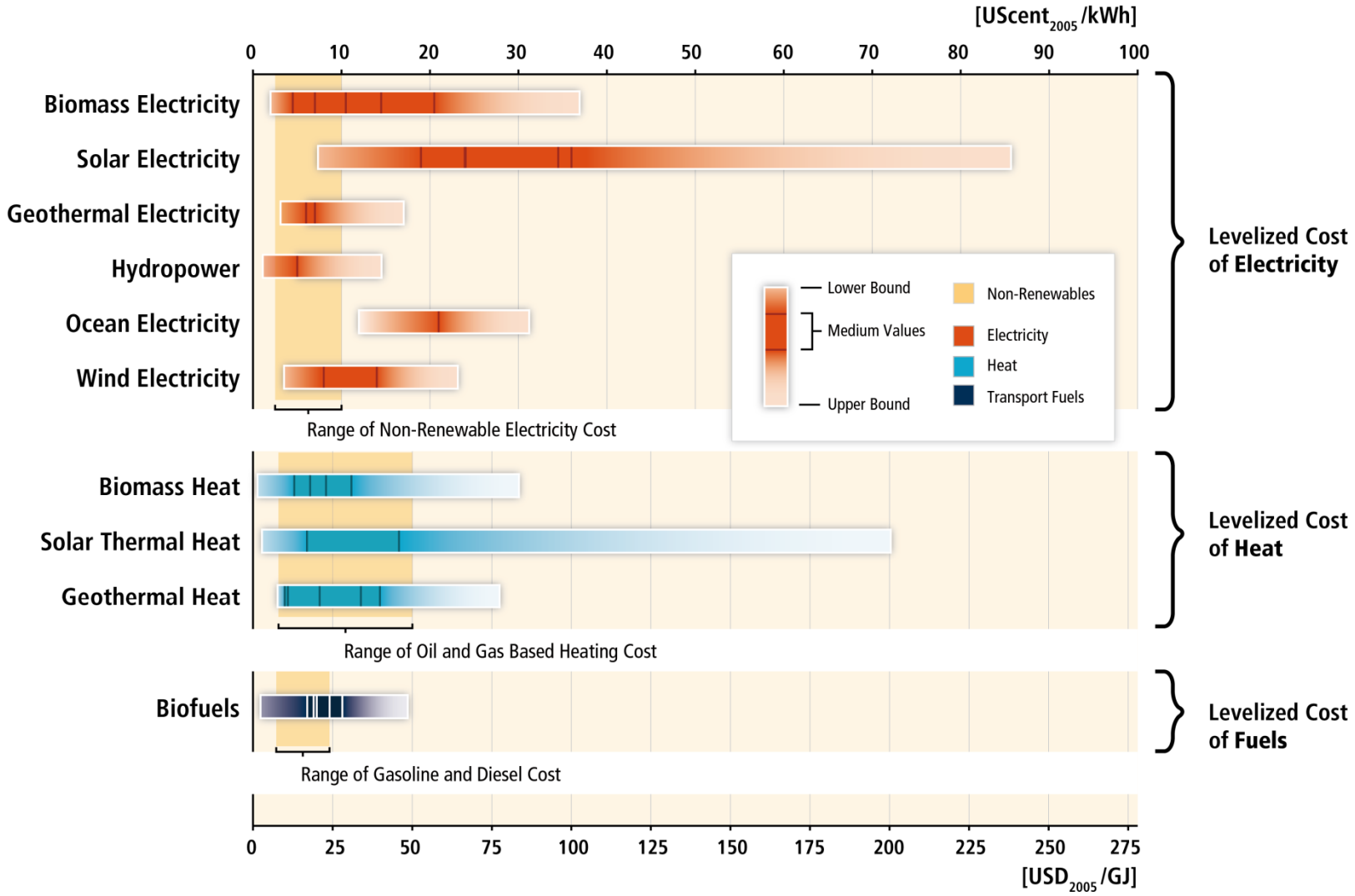
Current energy system is dominated by fossil fuels



Shares of different energy carriers in total primary energy supply in 2008

SRREN IPCC 2011

The costs of renewables are mostly higher than of non-renewables, but ...



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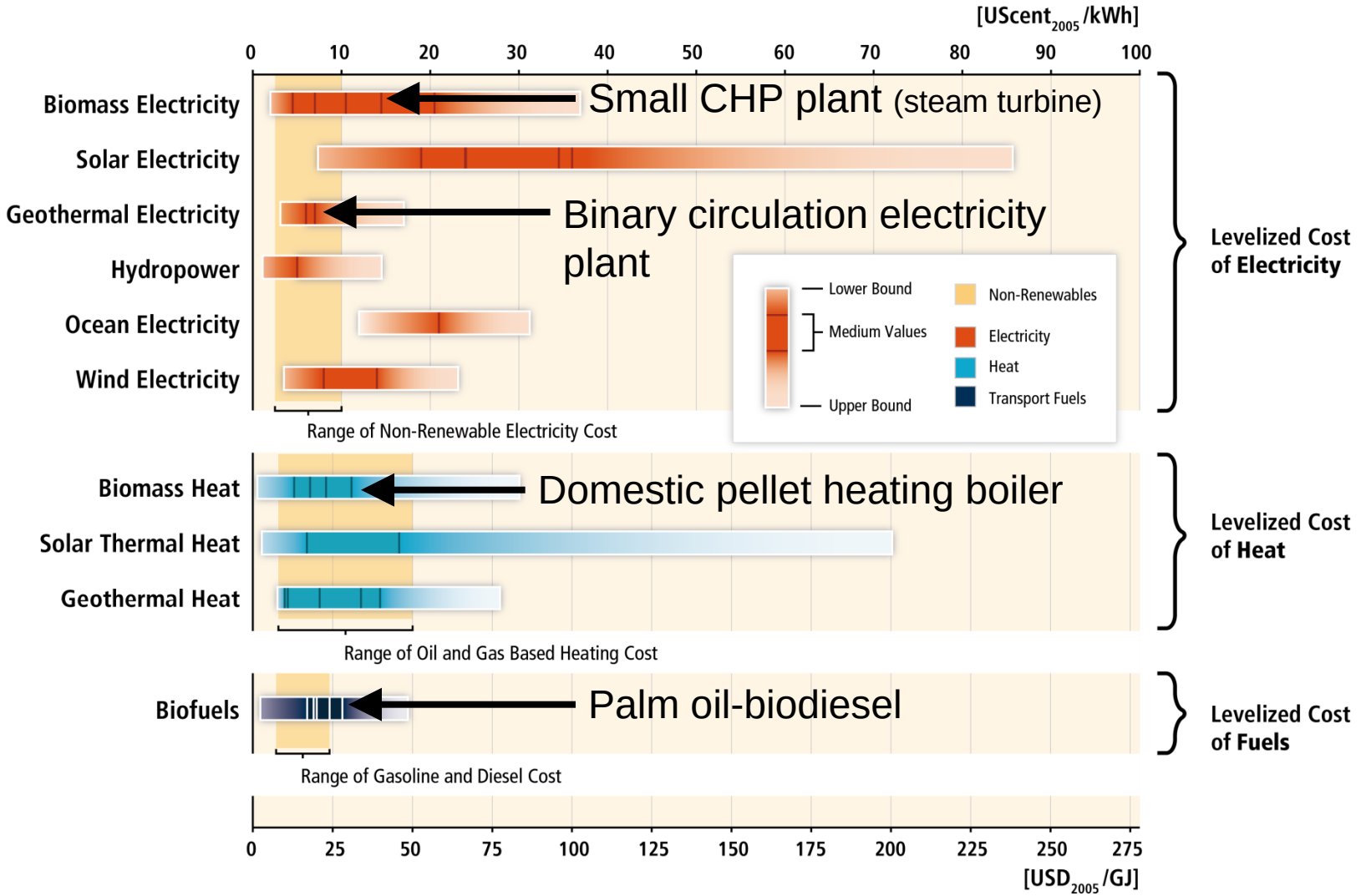
...some renewable technologies are already competitive



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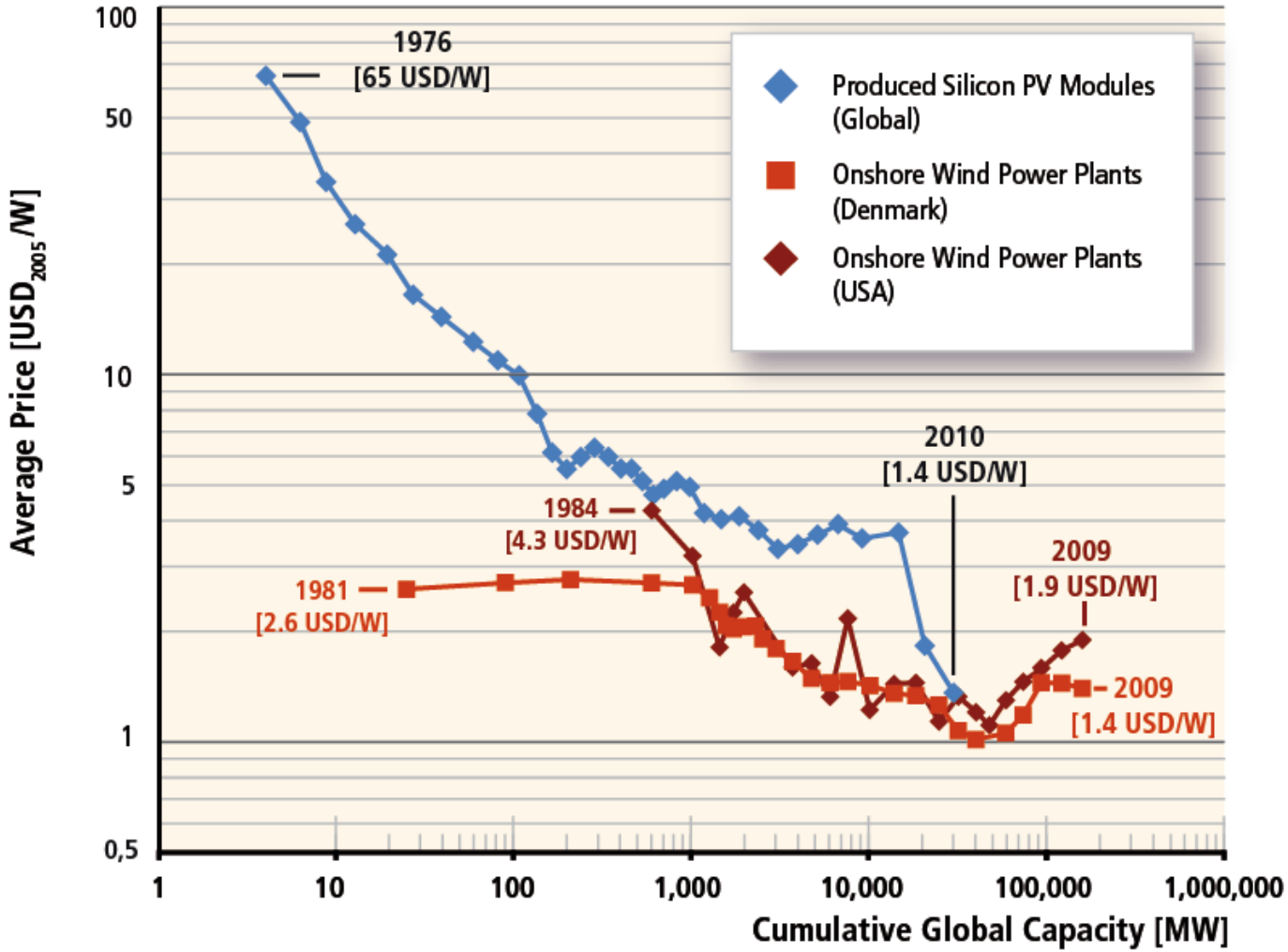
Technological advancement as potential „Game Changer“?



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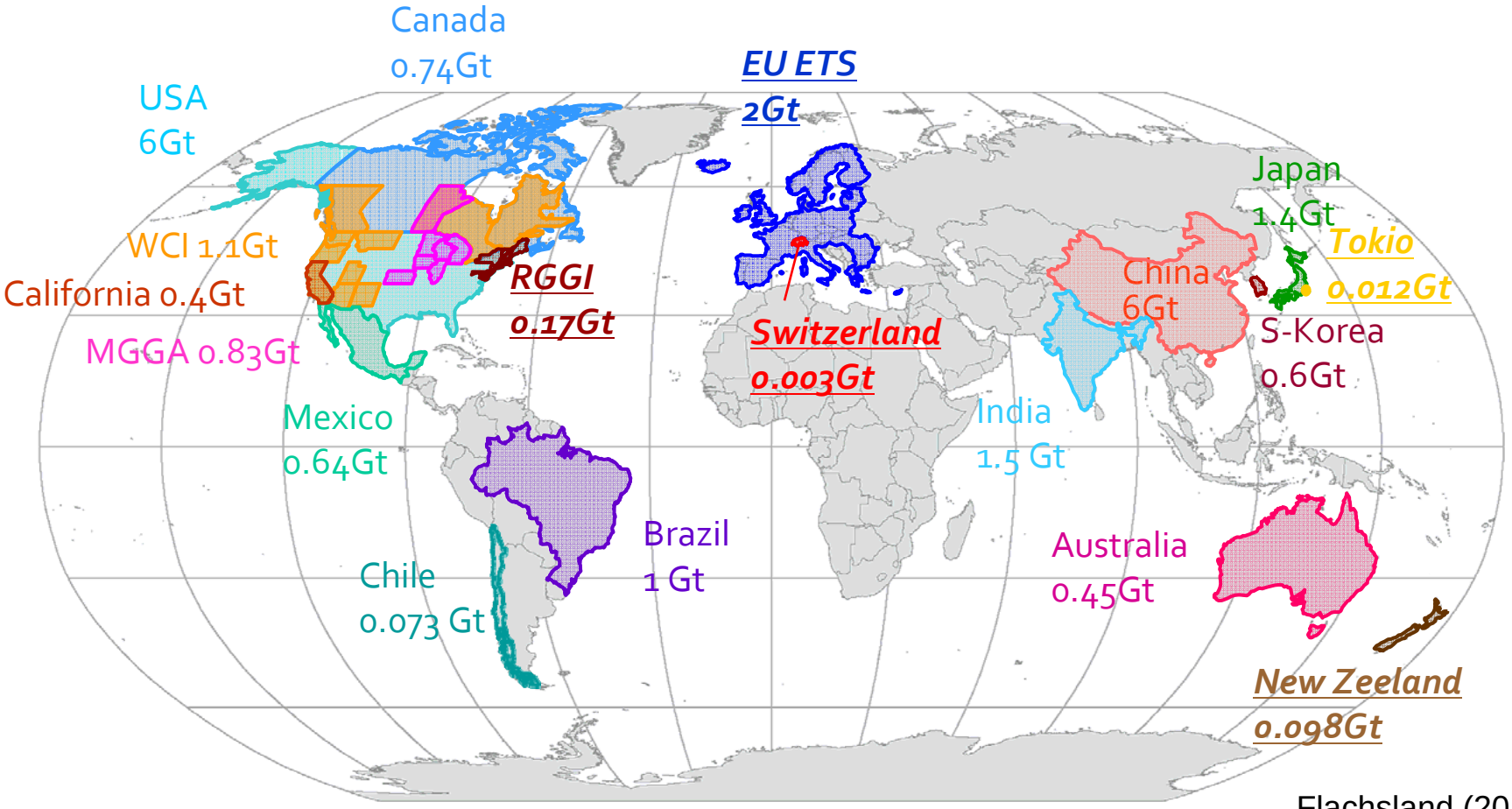
Creation and ‚linking' of emisson trading schemes

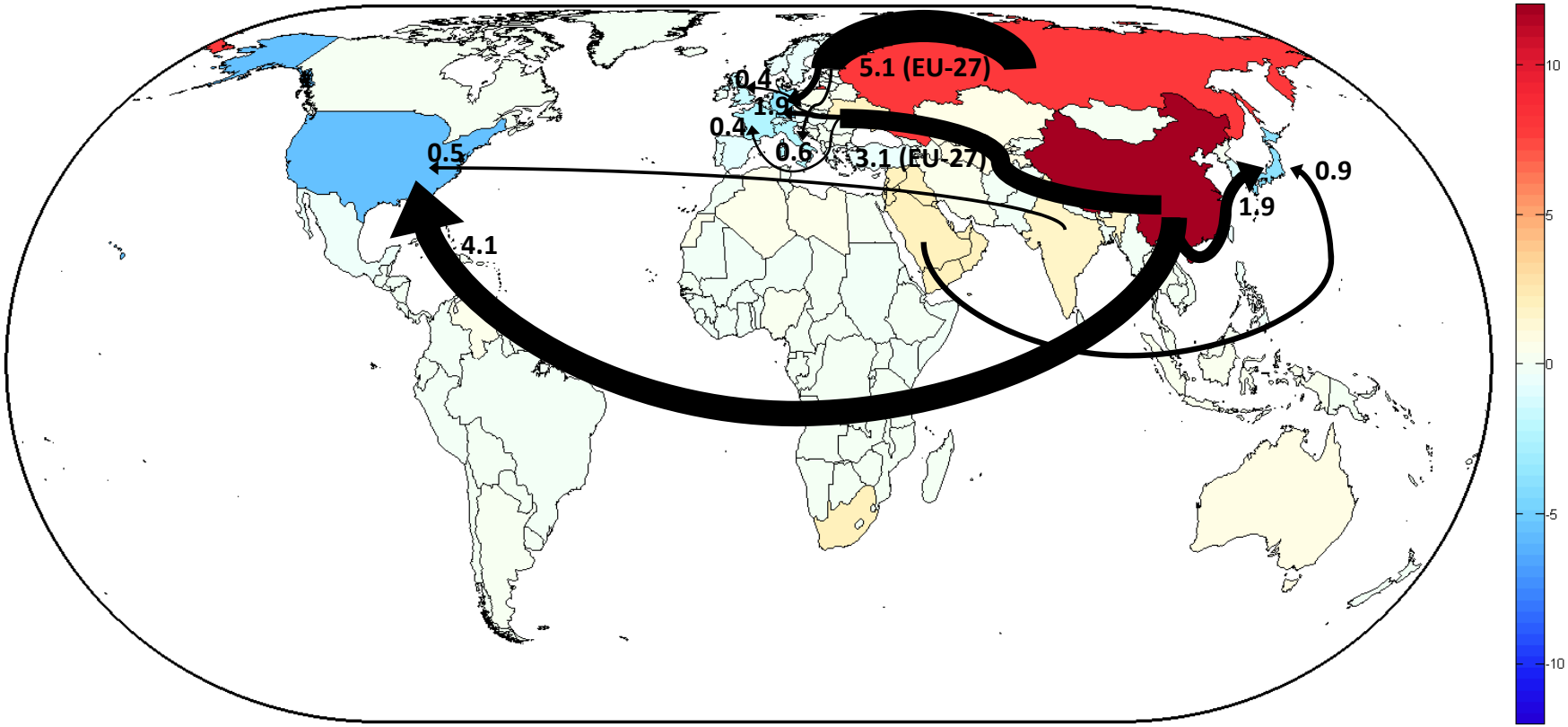


Flachsland (2011)

⇒ Reduction of mitigation costs by establishing access to low-cost abatement options

Justification for trade sanctions?

CO_2-trade balances for different world regions 1990-2008

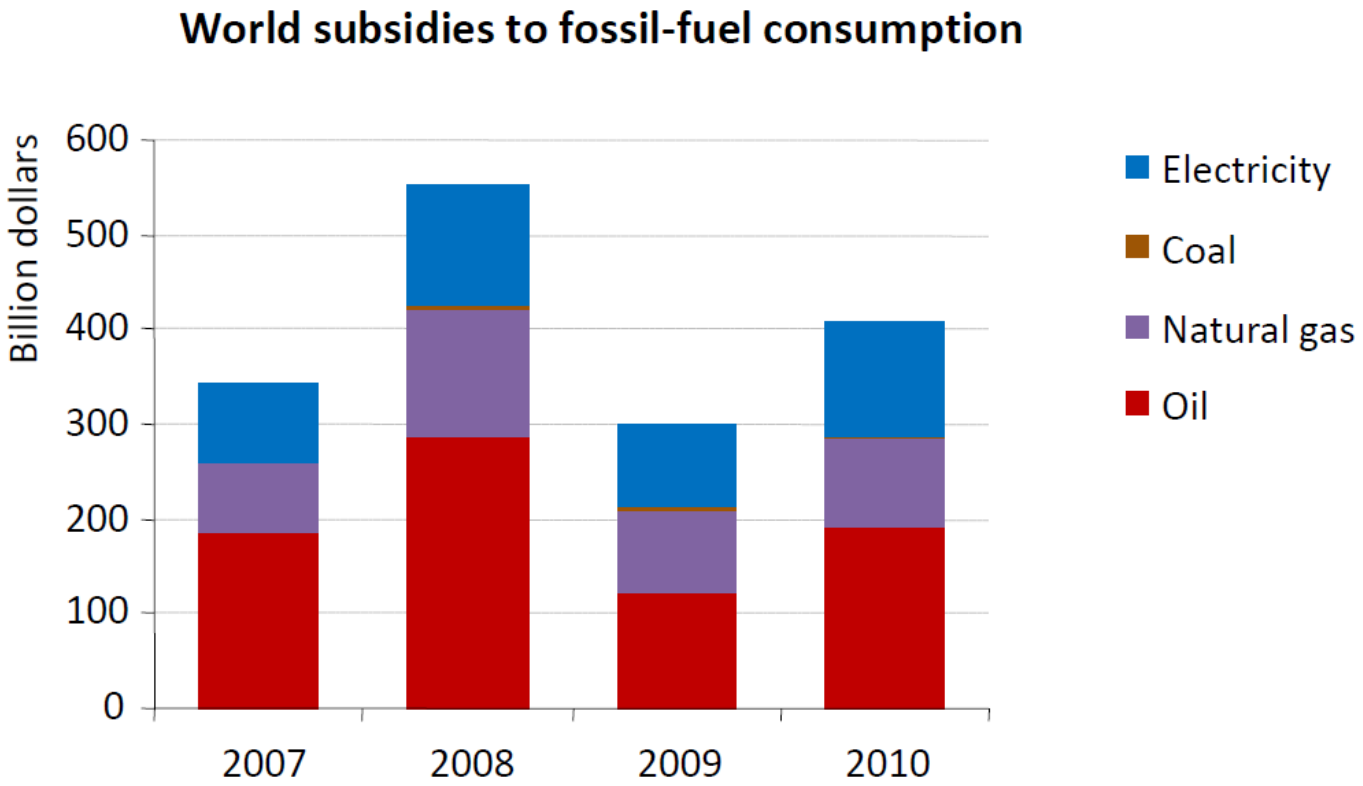


Blue: CO_2-Importing

Red: CO_2-Exporting

Peters, Minx, Weber und Edenhofer (2011)

Reducing subsidies for fossil fuel energy: „No regret“



Fossil fuel subsidies have been driven higher by the rebound in international energy prices they totalled $409 billion in 2010 – about $110 billion up on 2009

IEA World Energy Outlook 2011

Reducing subsidies for fossil fuel energy: „No regret“

- Current subsidies for fossil fuel energy correspond to a **negative CO_2-price** of on average 9US$ per ton CO_2 !

  [Source: own calculation]

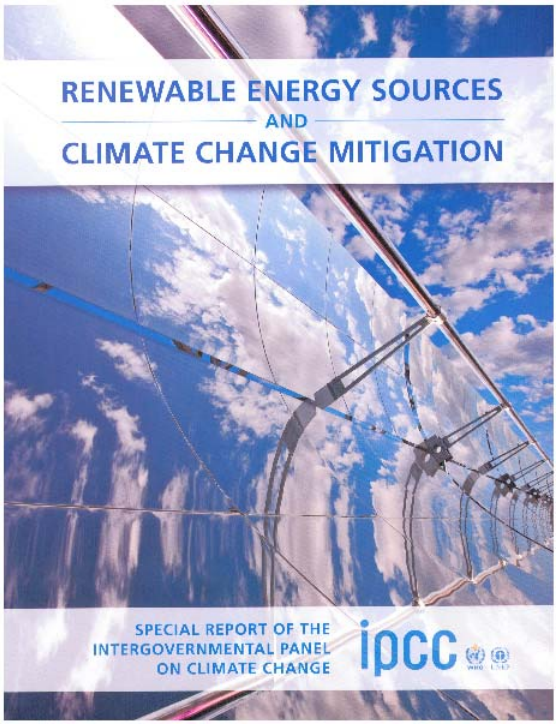
- **Without further reform, spending on fossil-fuel consumption subsidies is set to reach $660 billion in 2020, or 0.7% of global GDP**

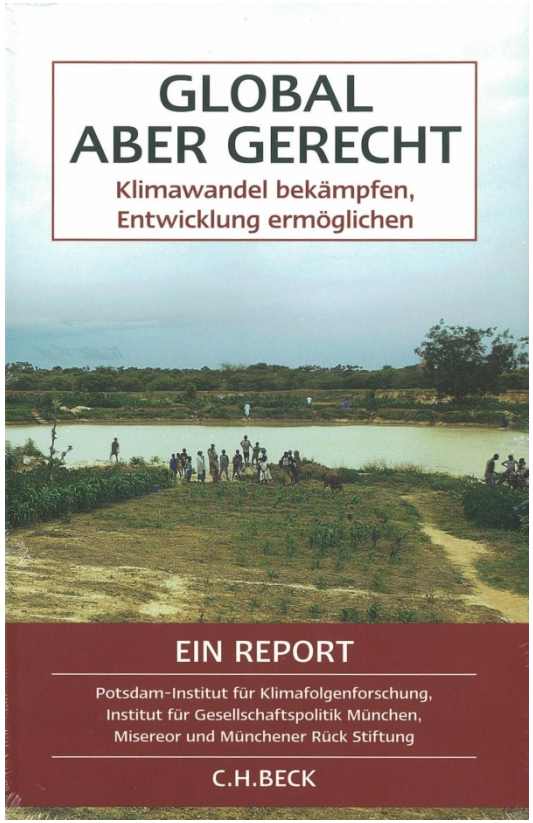
- **Phasing-out fossil-fuel consumptions subsidies by 2020 would:**
  - *slash growth in energy demand by 4.1%*
  - *reduce growth in oil demand by 3.7 mb/d*
  - *cut growth in CO_2 emissions by 1.7 Gt*

- **Many countries have started or planned reforms since early-2010**
  - *key driver has been fiscal pressure on government budgets*
  - *G20 & APEC commitments have also underpinned many reform efforts*
  - *much more remains to be done to realise full extent of benefits*

IEA World Energy Outlook 2011

Recommended Reading





http://srren.ipcc-wg3.de/report

http://www.klima-und-gerechtigkeit.de/