Managing the Global Commons: The Atmosphere

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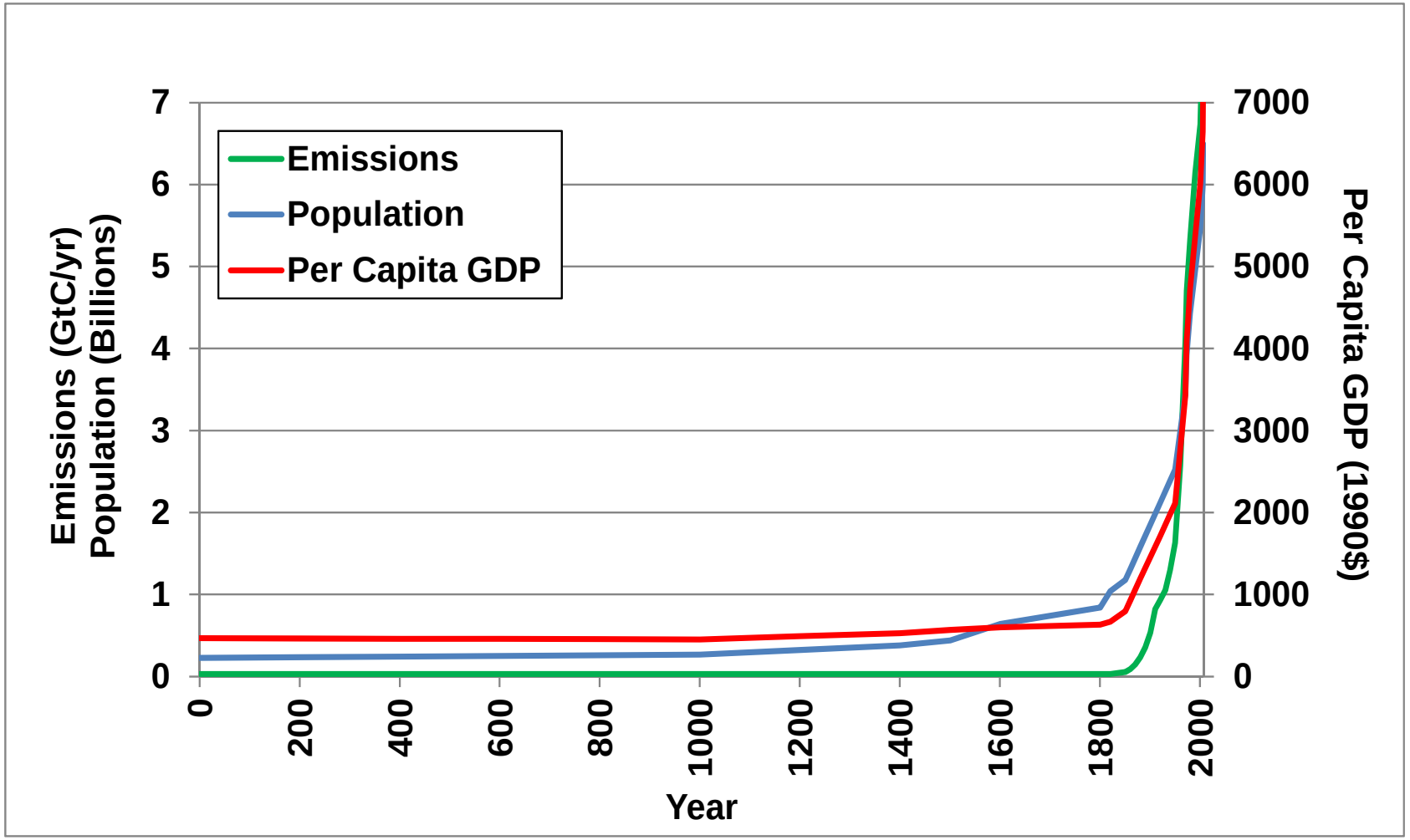
PIK

MCC
Mercator Research Institute on
Global Commons and Climate Change

berlin

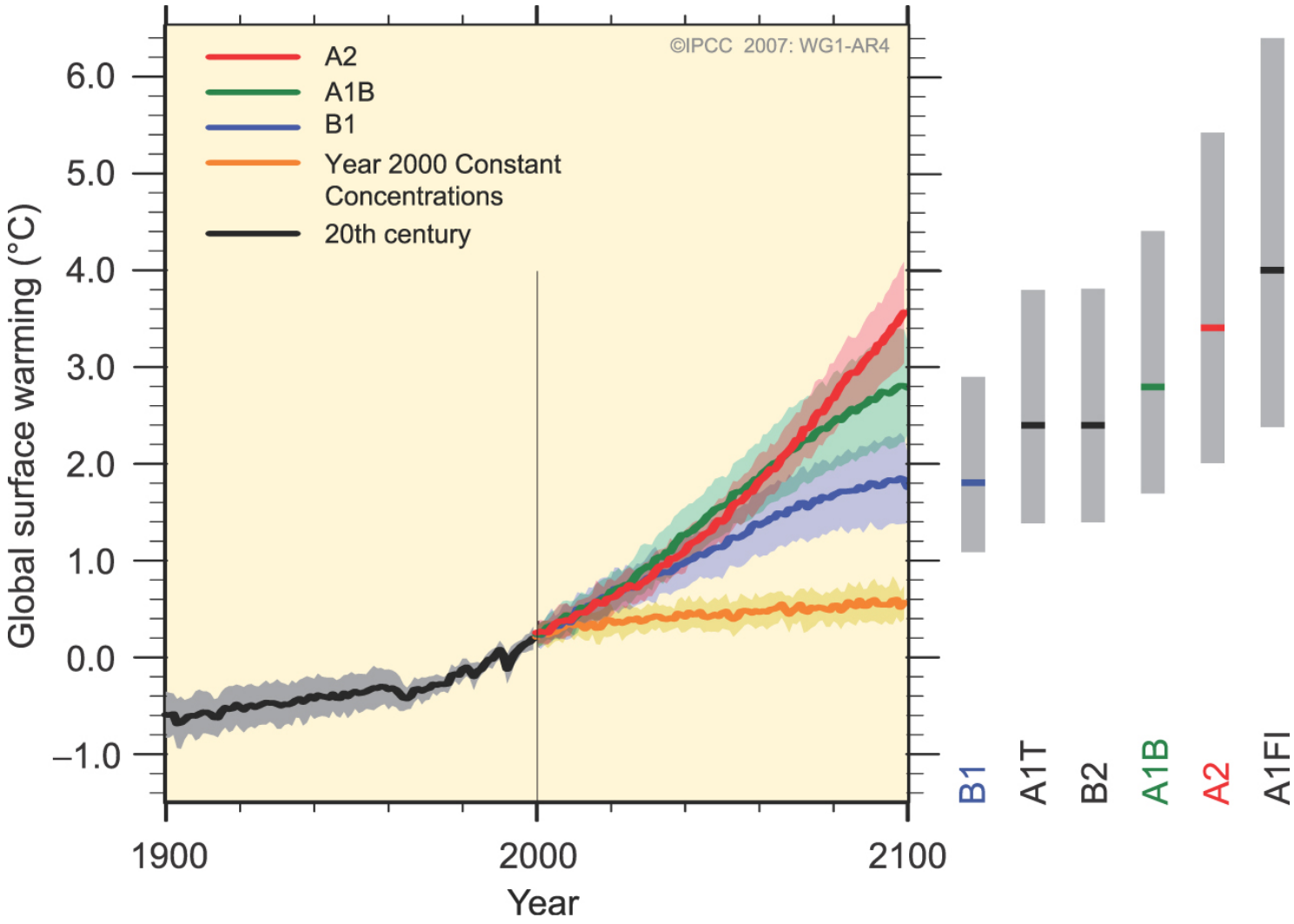
ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP
Working Group III (WG III) – Mitigation of Climate Change

Economic Growth and Emissions



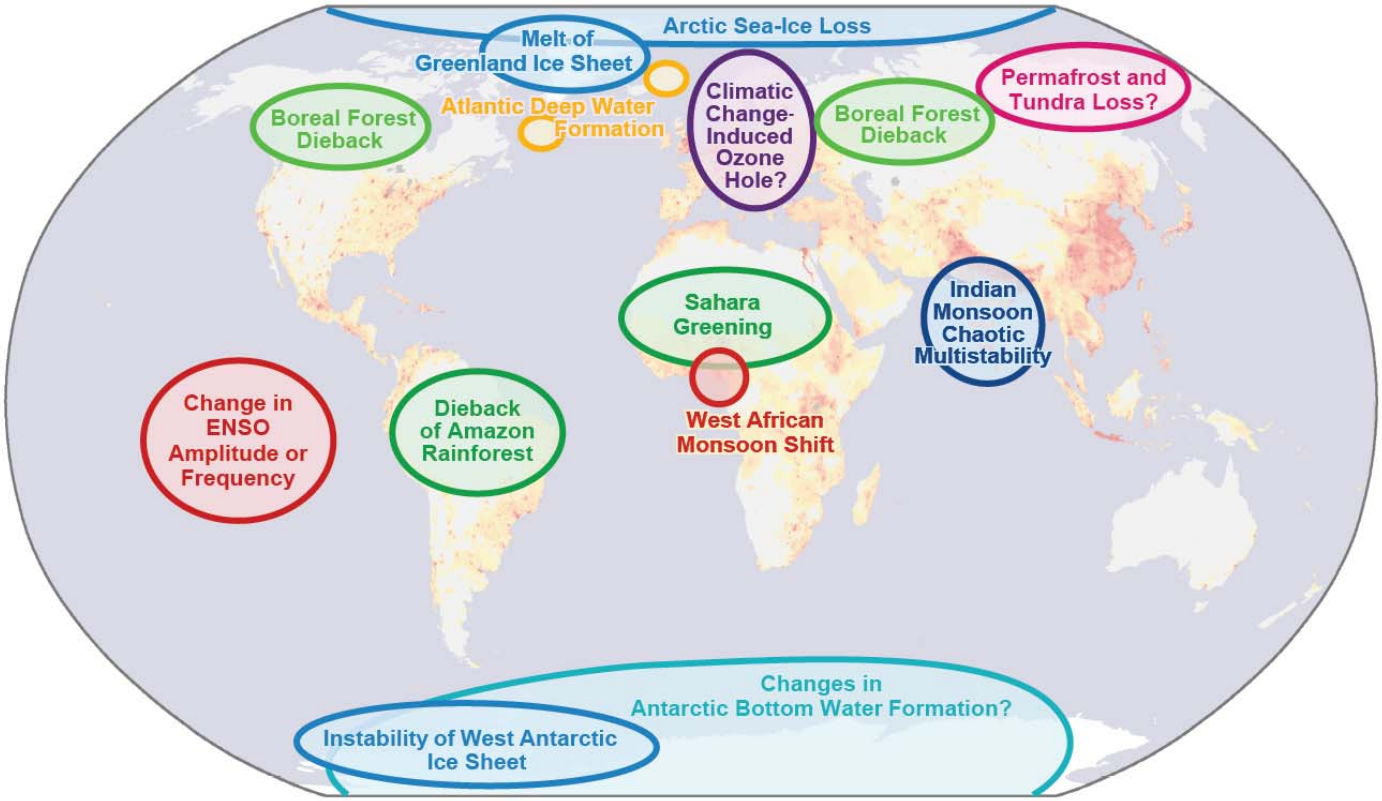
Edenhofer et al. 2012

Emissions and Climate Change



IPCC 2007

Climate Change Risks



“Tipping elements in the earth system”

may react strongly even to minor changes in the global climate system

Schellnhuber 1996, Lenton et al. 2008

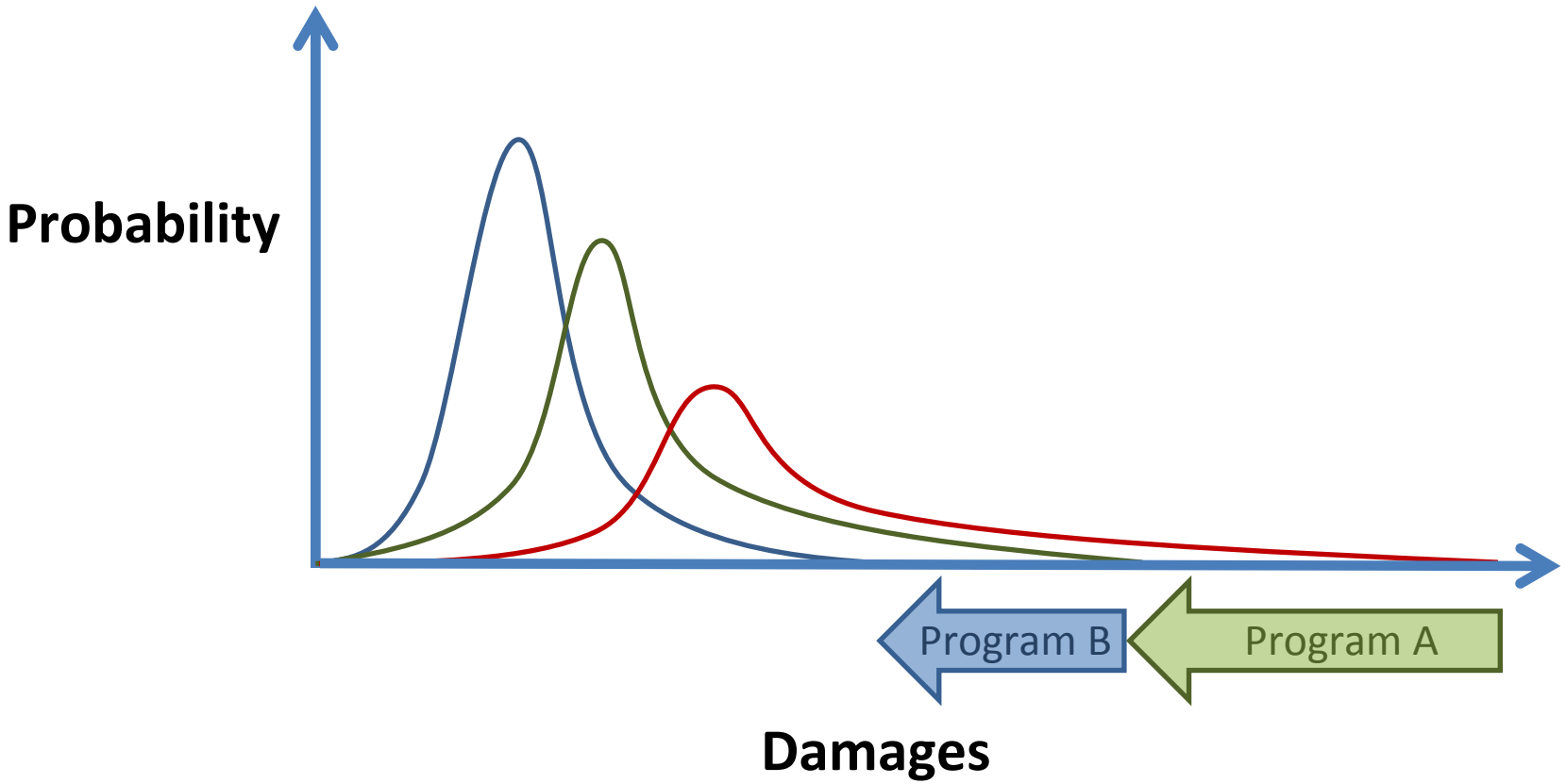
Managing Climate Change: Strong Sustainability

Stabilization level (in ppm CO_2-e)	2°C	3°C	4°C	5°C	6°C	8°C
400	22	7	3	1	1	0
450	60	15	7	3	2	0
550	88	51	19	11	6	2
650	94	77	42	19	12	5
750	97	88	65	34	17	8
1000	99	94	86	65	42	15

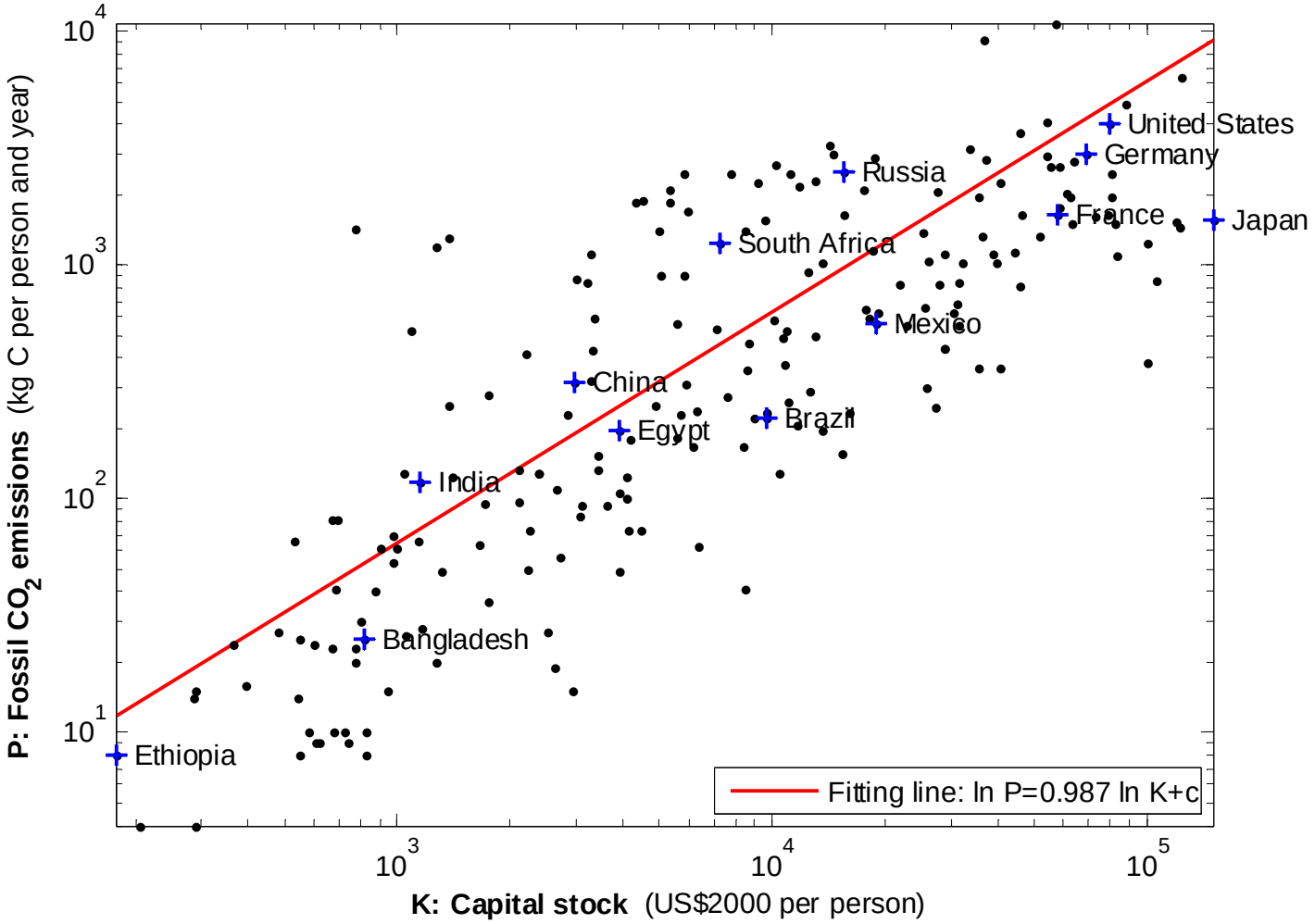
Likelihood (in percentage) of exceeding a temperature increase above the pre-industrial level at equilibrium (adapted from Rogelj et al. 2012))

Mattauch 2012

Climate Policy as an Insurance

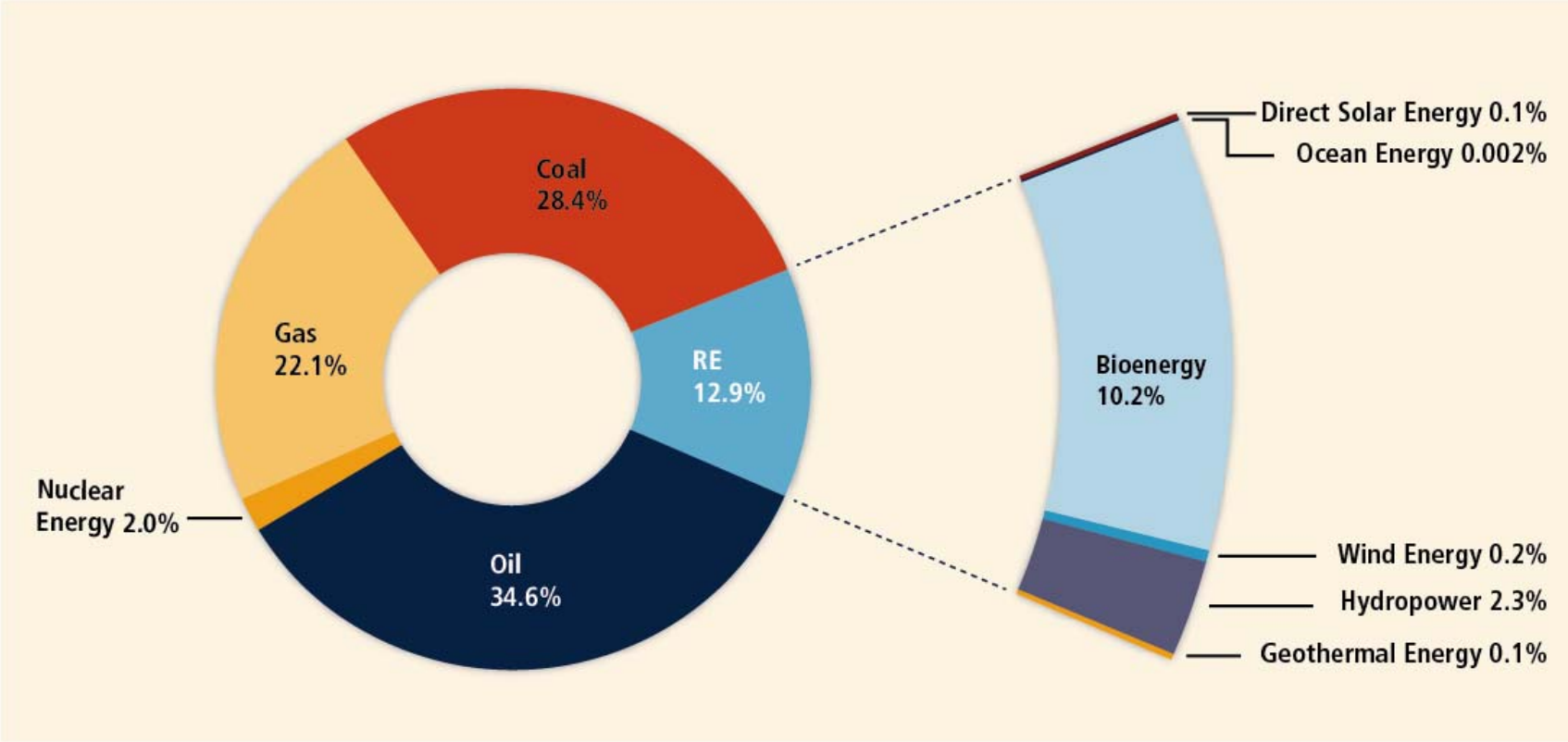


Risks of Mitigation?



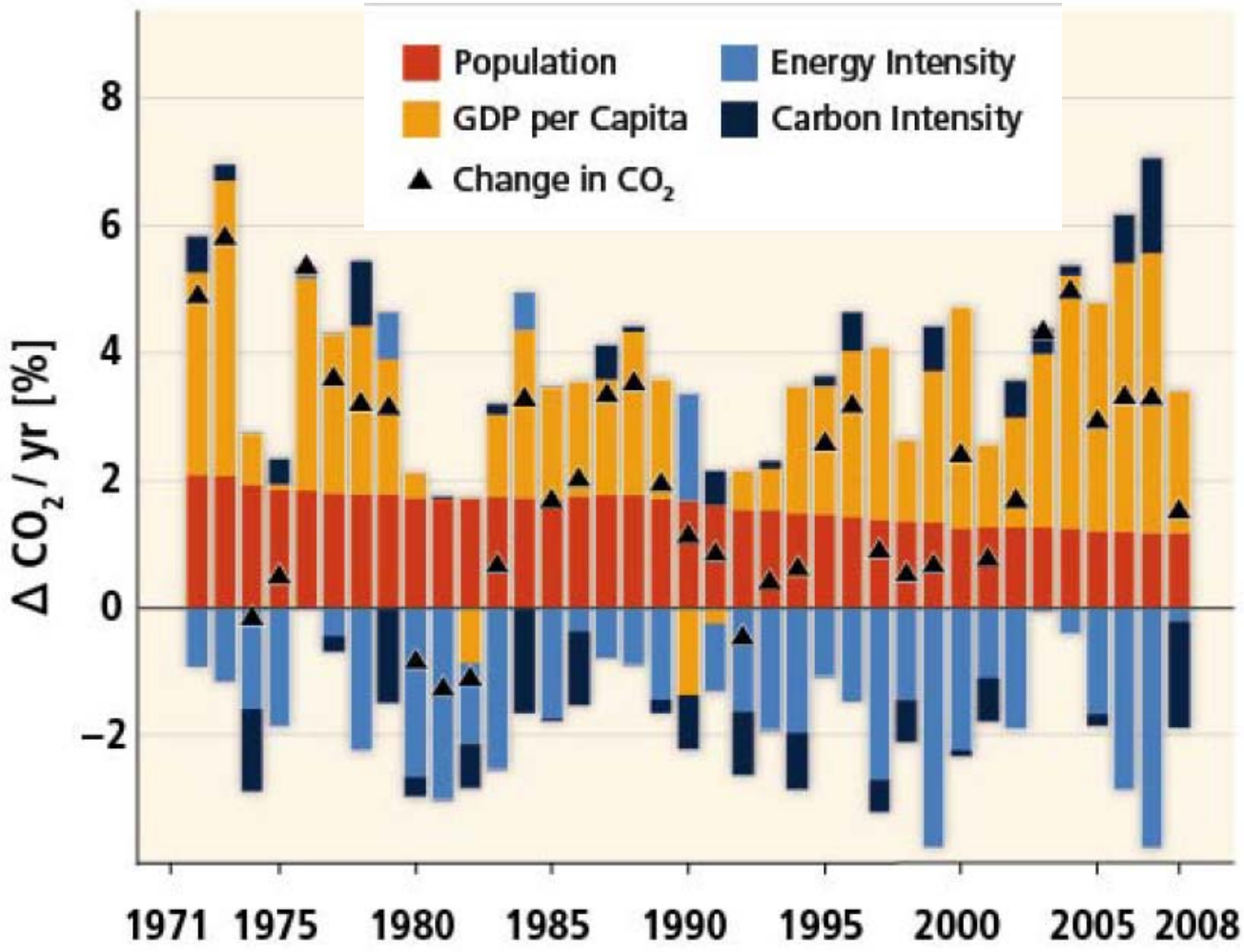
Füssel 2007

The Global Energy System: Dominated by Fossil Fuels



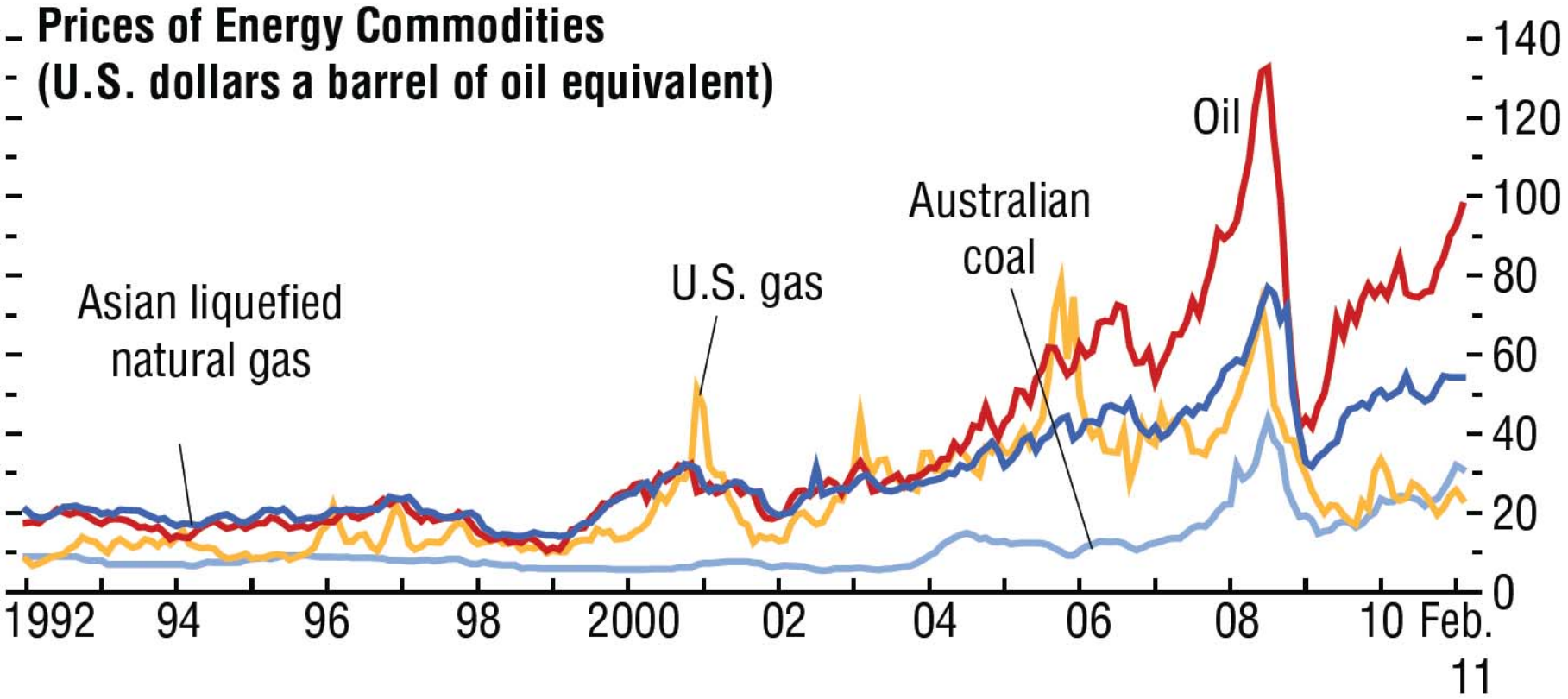
IPCC 2011

We are not on Track!



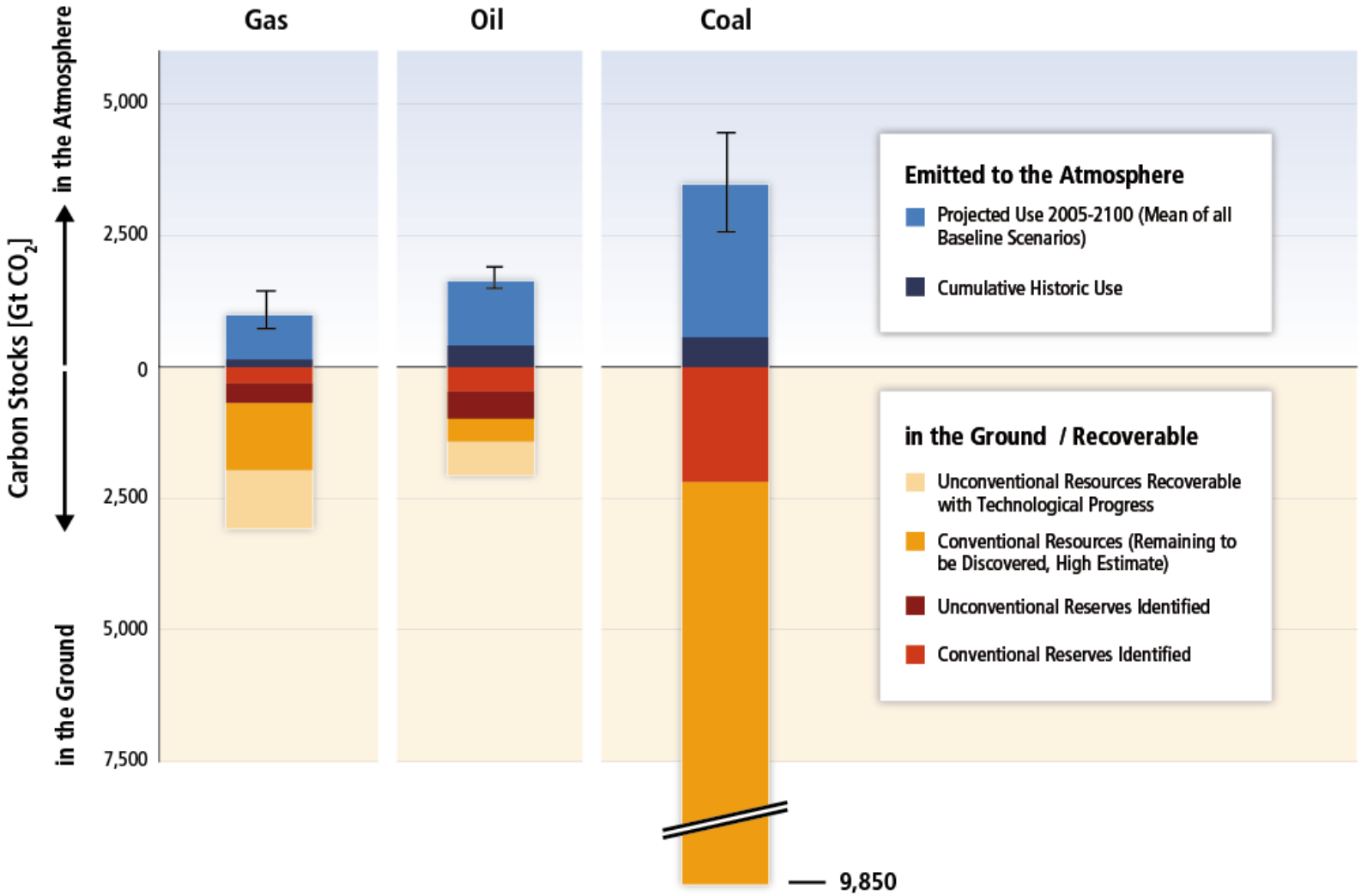
IPCC 2011

Renaissance of Coal



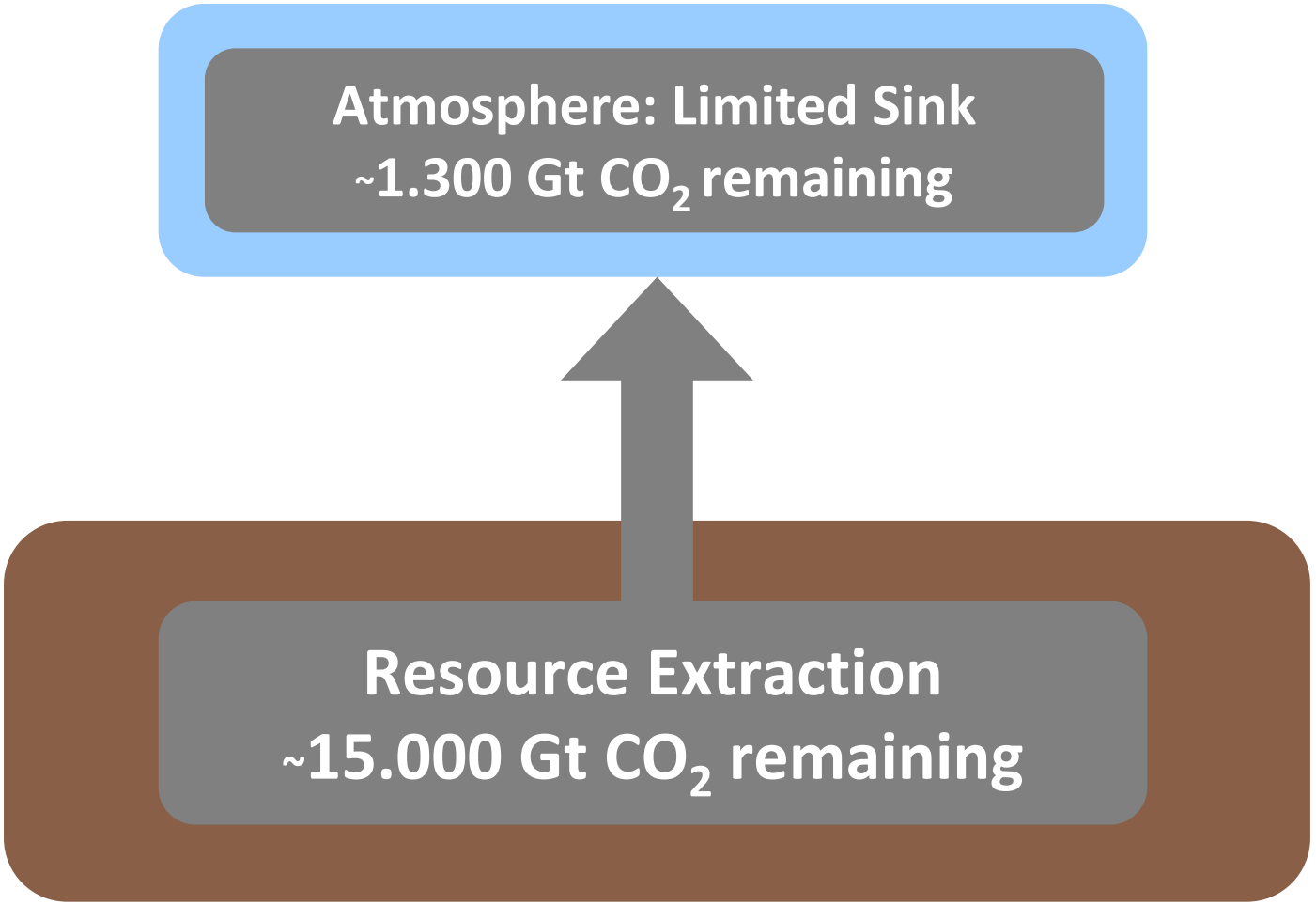
IMF 2011

There is no Fossil Fuel Scarcity

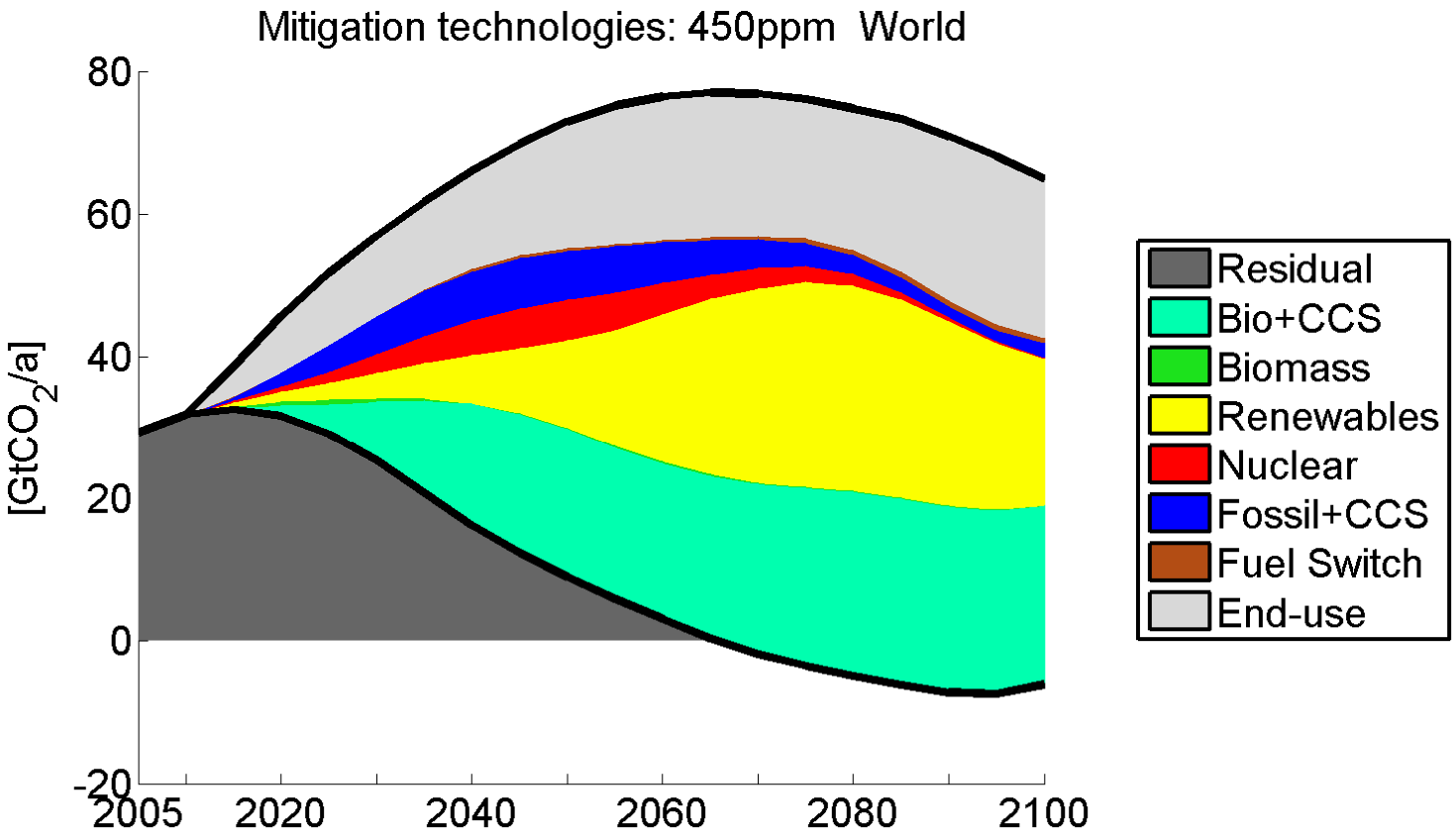


IPCC 2011

The Atmosphere is a Common-Pool Sink

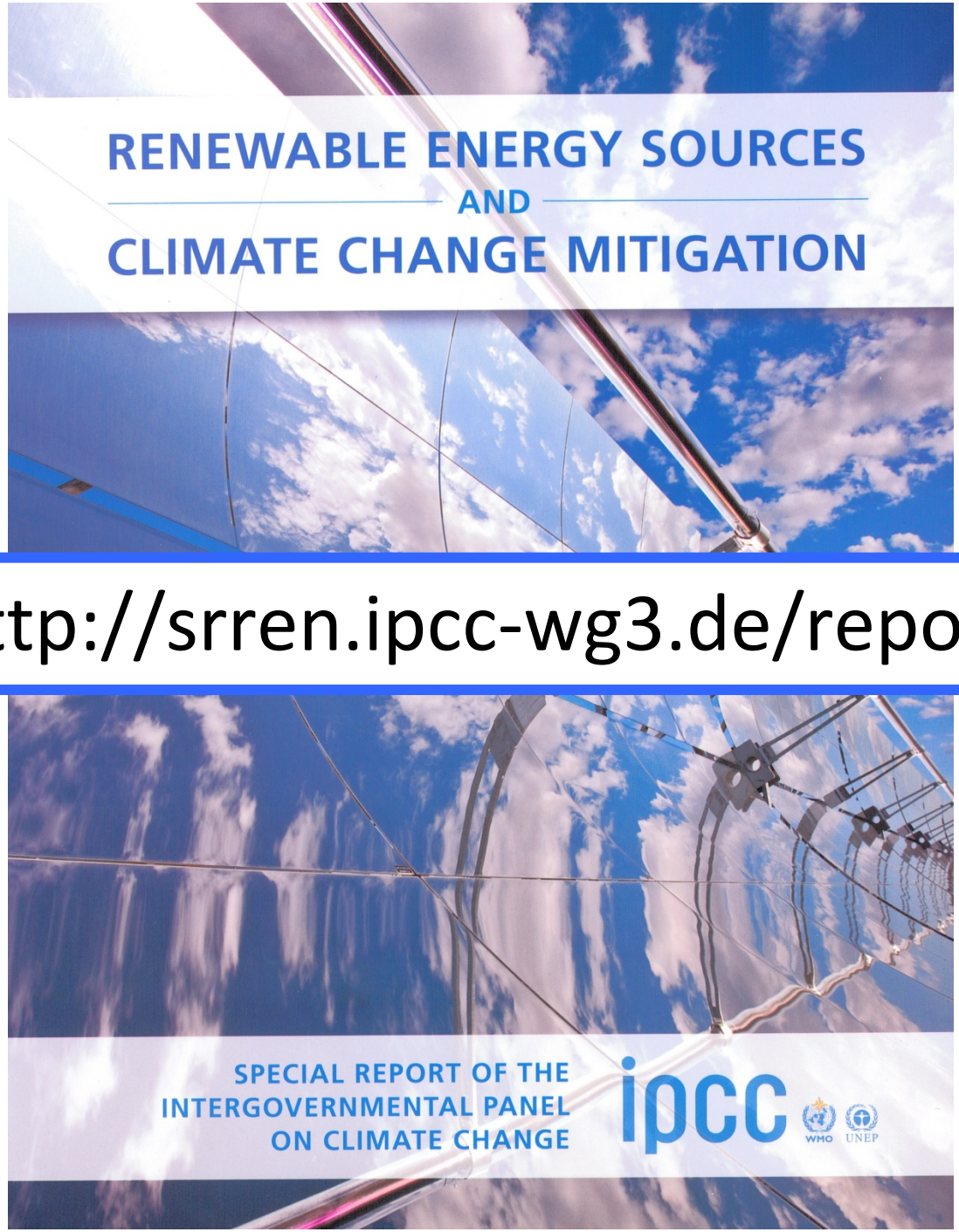


Transformation Pathways: Technological Options



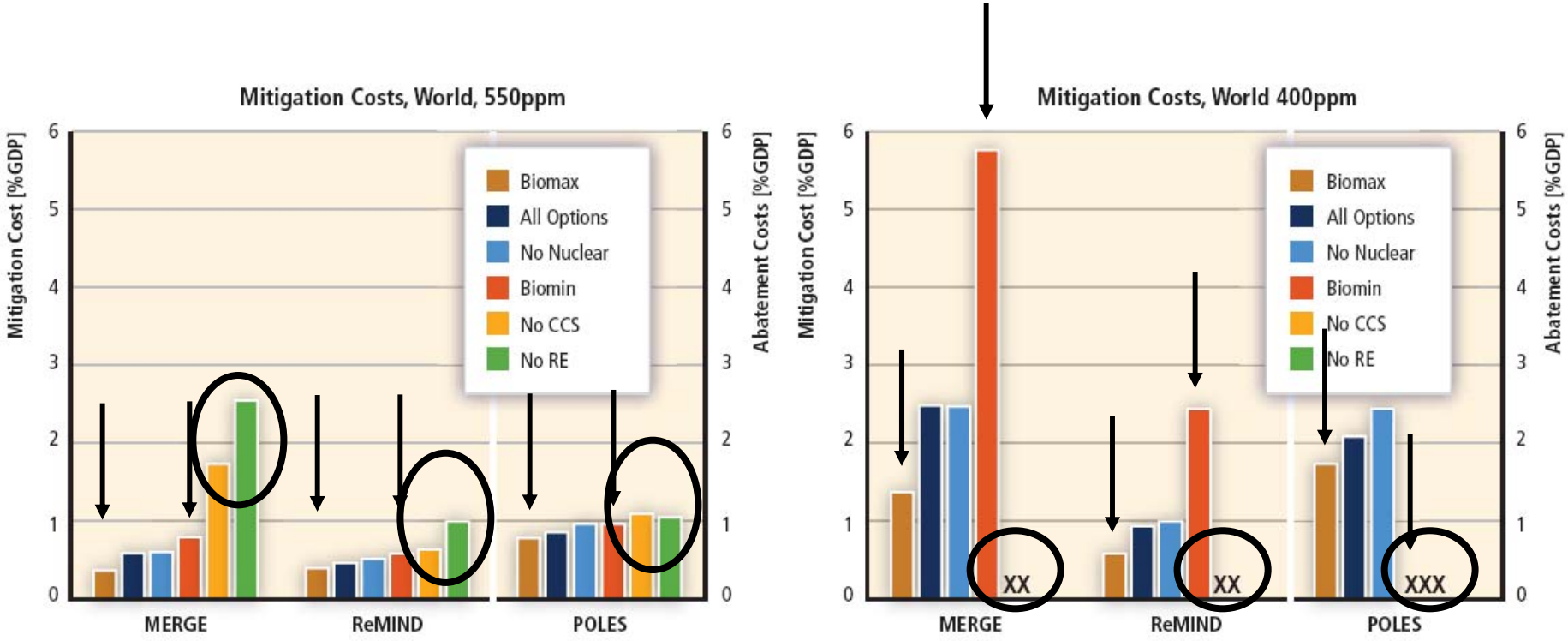
Three pillars: End-use Efficiency / Renewables / Biomass + CCS

Luderer et al. 2011



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

Technologies and Mitigation Costs

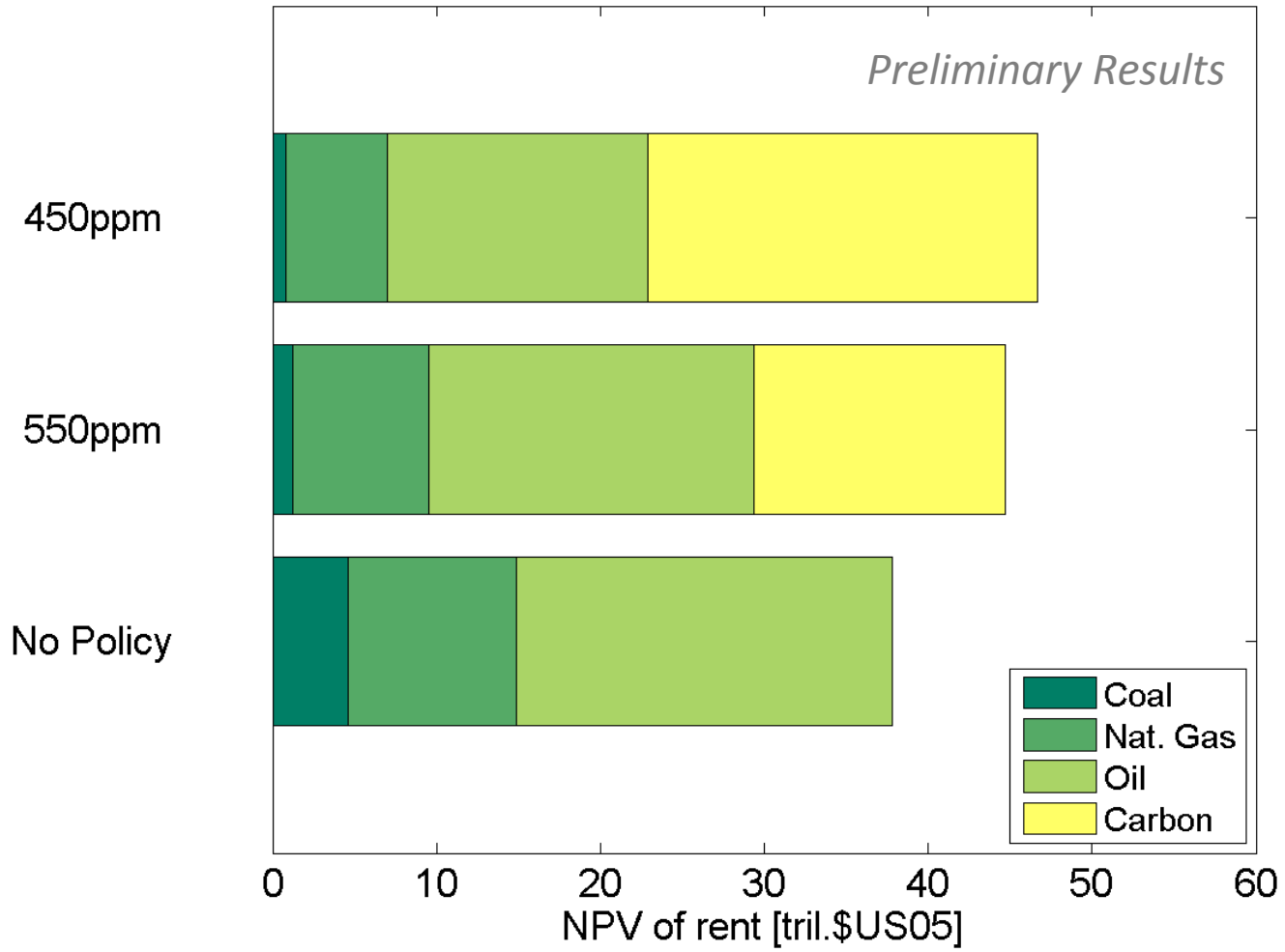


IPCC 2011,
Edenhofer et al. 2010

Costs hinge critically on:

- The Global Carbon Budget
- The Use of Biomass in the Energy System
- The Availability of Technologies, in particular RE and CCS

Transformation of Resource Rent into Climate Rent



(Discounted at 5% p.a.)

Bauer 2012, in preparation

The Political Economy of Climate Policy

- Climate Rent = Price Emissions * Emission Budget

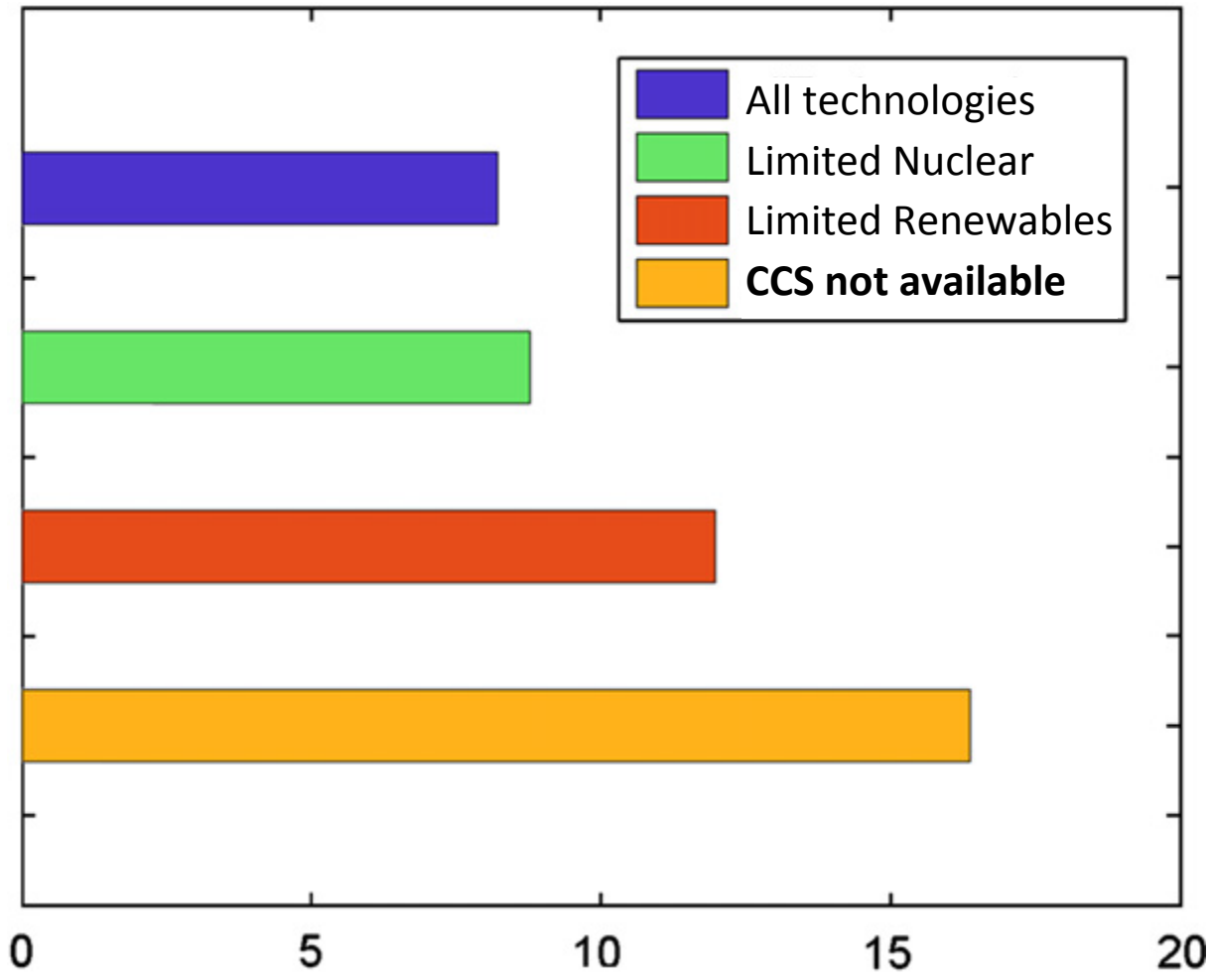
- **Conflicts over**
  - **Resource Rents and**
  - **Climate Rent**

  are Decisive for Adoption of Climate Policy

- Compensation?

- Technologies!

Technologies Determine Climate Rent



NPV of Climate Rent (Trillion US-$)

(Discounted at 7% p.a.)

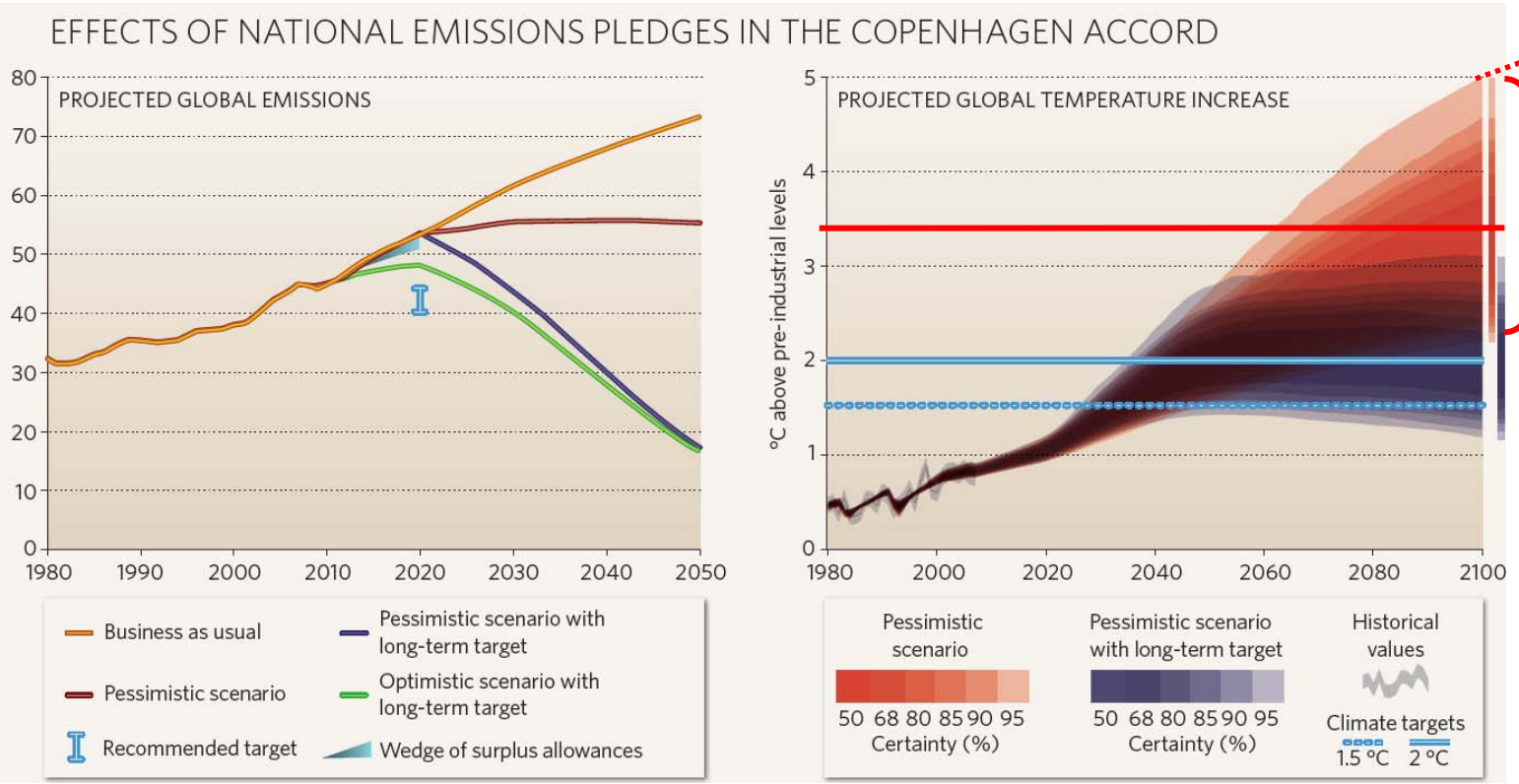
Lüken et al. 2011

Overlapping Commons

	Social	Natural
Sub-Global	• **Roads** • **Public Transport** • **Education System** • **Health System** • **Trust** (free-riding)	• **Subsurface Resources** • **Freshwater** • **Air** (Pollutants) • **Coastal fisheries** • **Natural amenities**
Global	• **Anti-Commons: Underuse of Knowledge** • **Catastrophy response infrastructure** • **Trust** (free-riding)	• **Atmosphere** (GHG & ODS sink) • **Oceans** (minerals,fish,sinks) • **Rainforests** (biodiversity,GHG sink) • **Electromagnetric Spectrum** • **Geostationary Orbit**

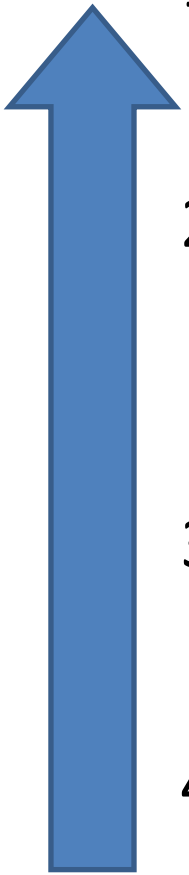
Governing the Commons: Collective Action

- Copenhagen: „Nash Collection Box“



Rogelj et al. (2010)

From „No Man‘s Land“ to Global Commons



1. Define Global Carbon Budget
   - Balancing Risks of Climate Change and Mitigation
2. Distribute Atmospheric Property Rights or Climate Rent
   - Normative Questions: Climate Rent as Common Property of Mankind?
3. Collective Action Challenges
   - Issue Linking and Compensating Transfers
4. Implementation in a Polycentric World
   - Carbon Pricing + Technology Policy
   - Using Climate Rent to Finance Public Goods, Debt

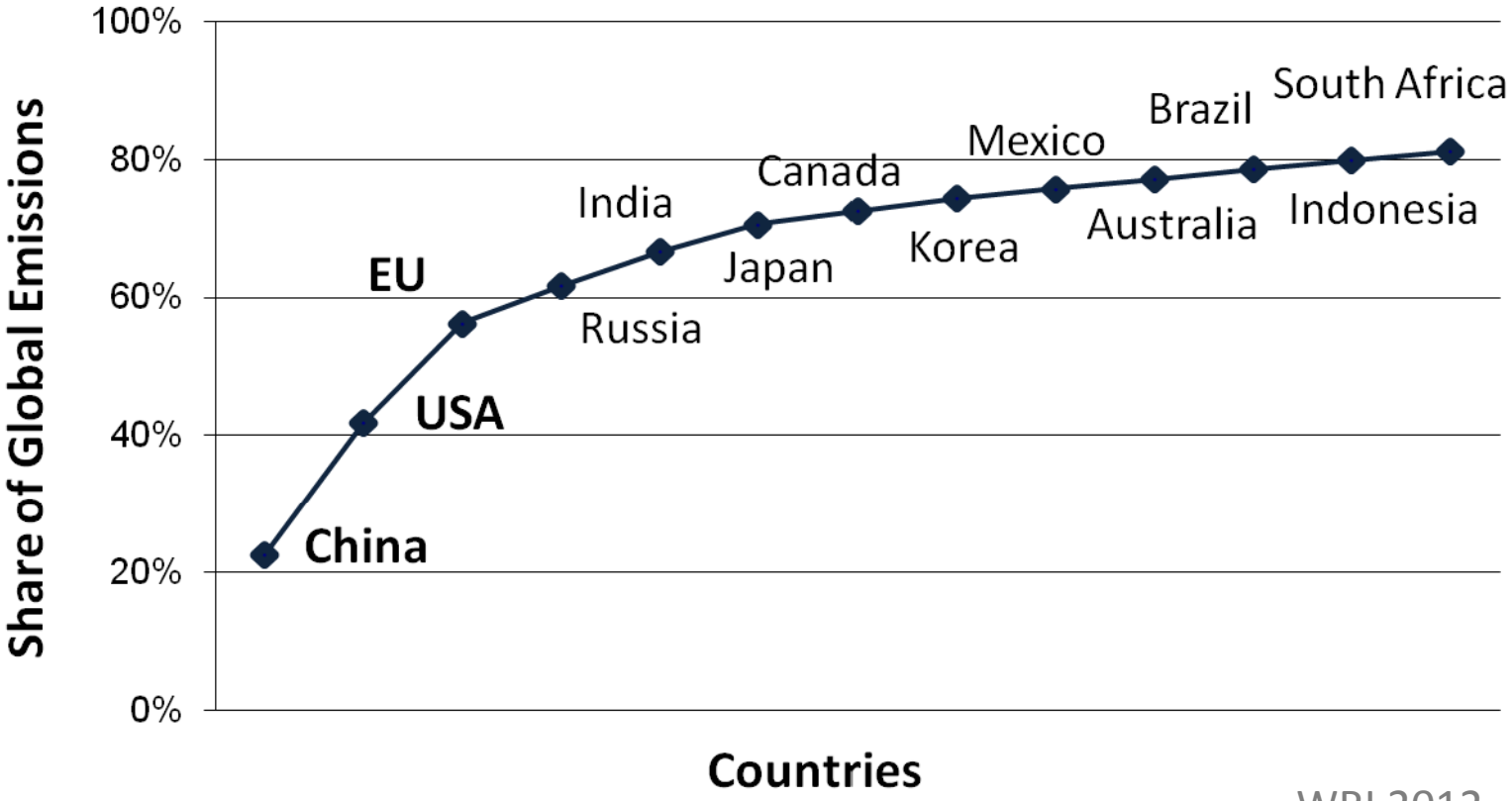
7 Ideas to Enhance Climate Cooperation

- Complement UN negotiations
- Technology Policies
- Transfers for Compensation
- Linking Emission Trading Systems
- Trade Sanctions Against Free-Riders
- Deforestation Policy
- No-Regret Policies

Complementing UNFCCC Negotiations

Cumulative emissions of countries in the
Major Economies Forum on Energy and Climate (MEF)

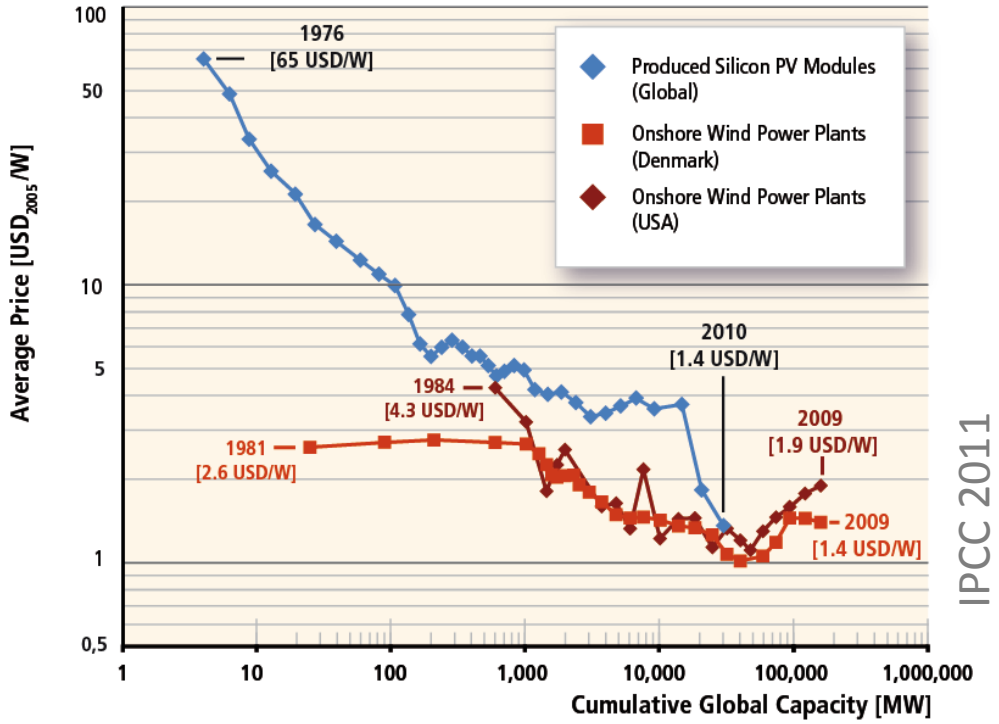
Year 2008. Only CO_2, without LULUCF emissions



WRI 2012

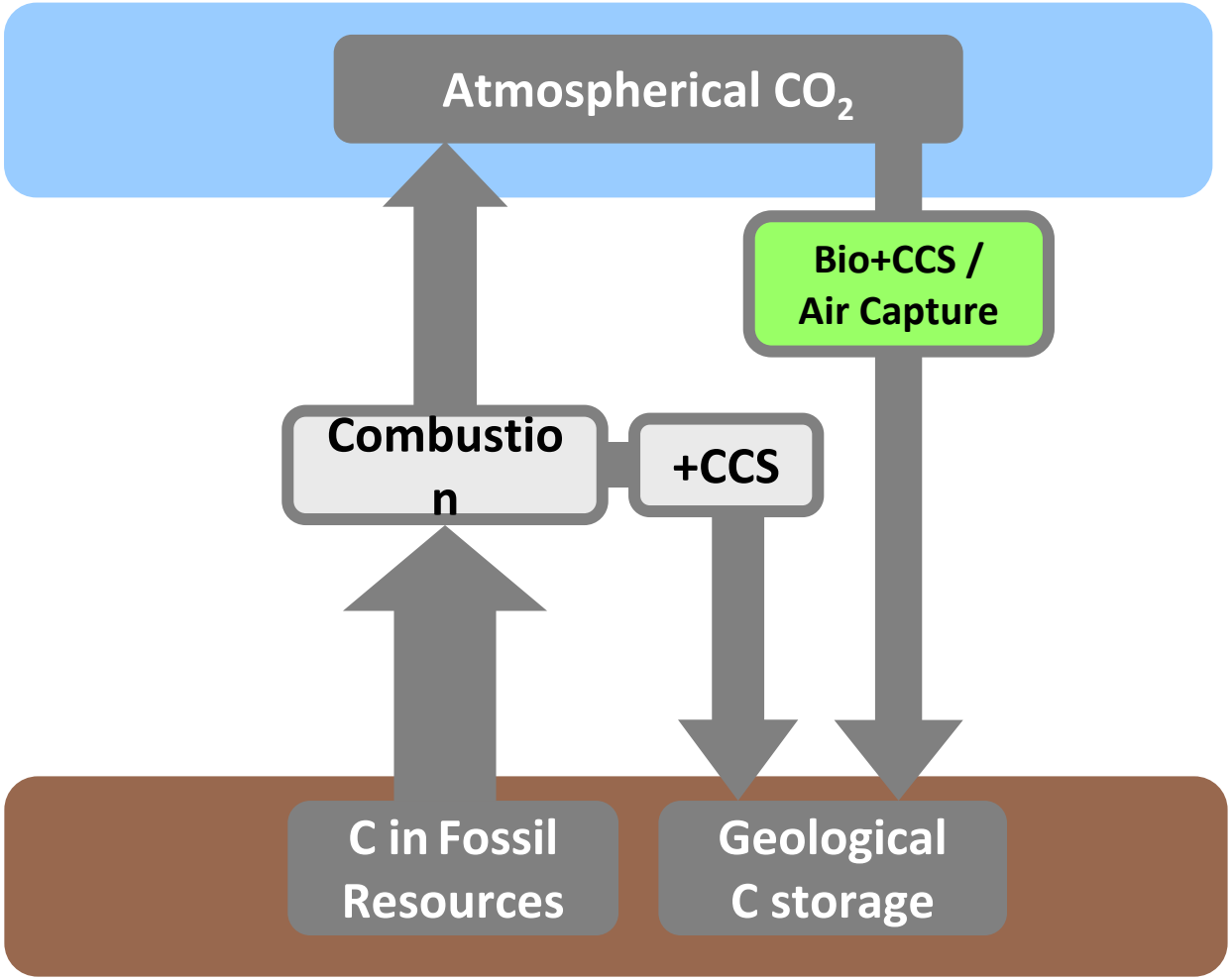
Rationales for Technology Policy

1) Market Failures
2) Joint R&D to Stabilize Coalitions
3) Public Good Provision by Concerned First Movers
4) Containing Carbon Rent and Distributional Stakes

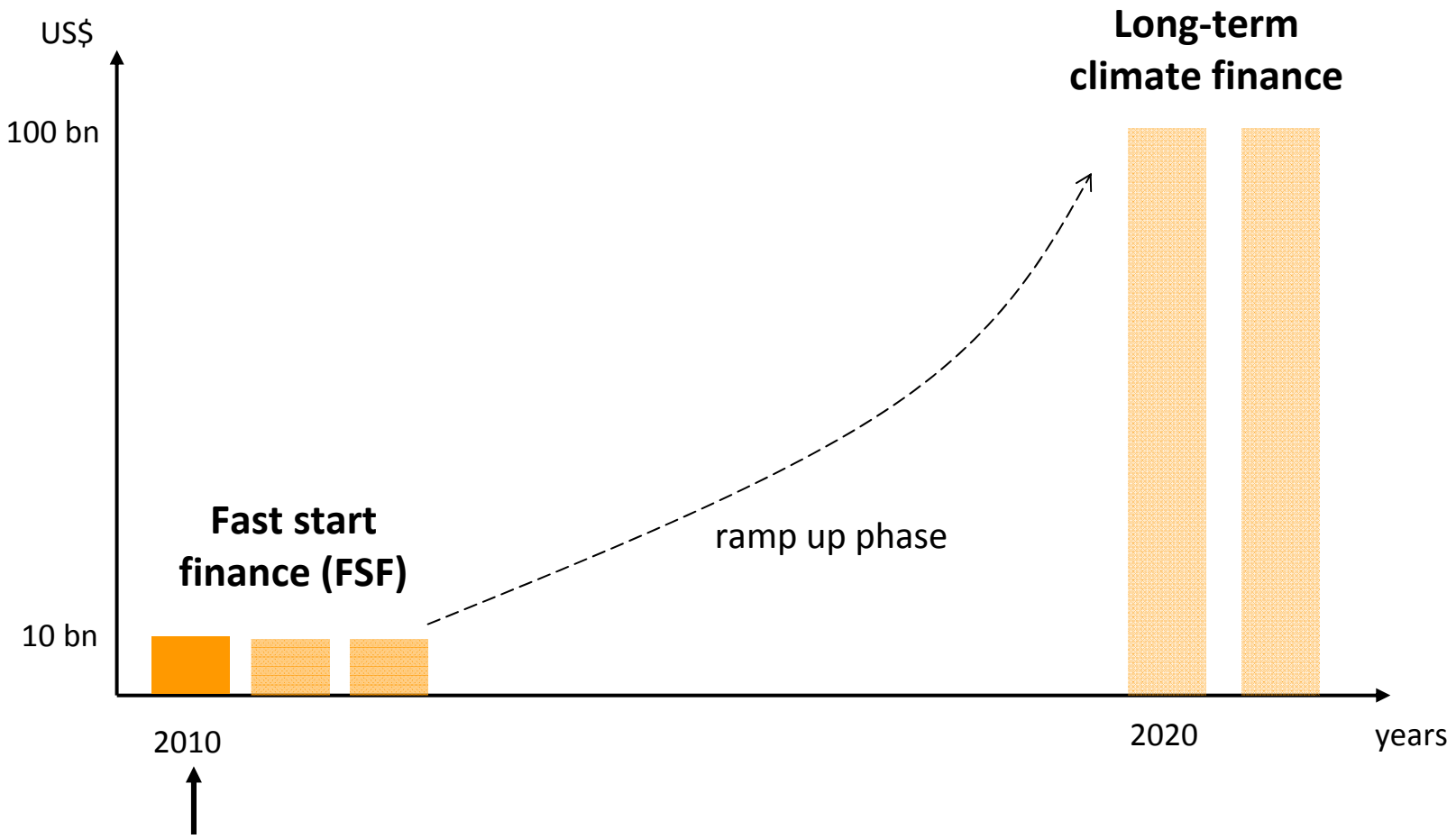


IPCC 2011

Carbon Capture and Storage



Carbon Rents and Compensation: Green Climate Fund

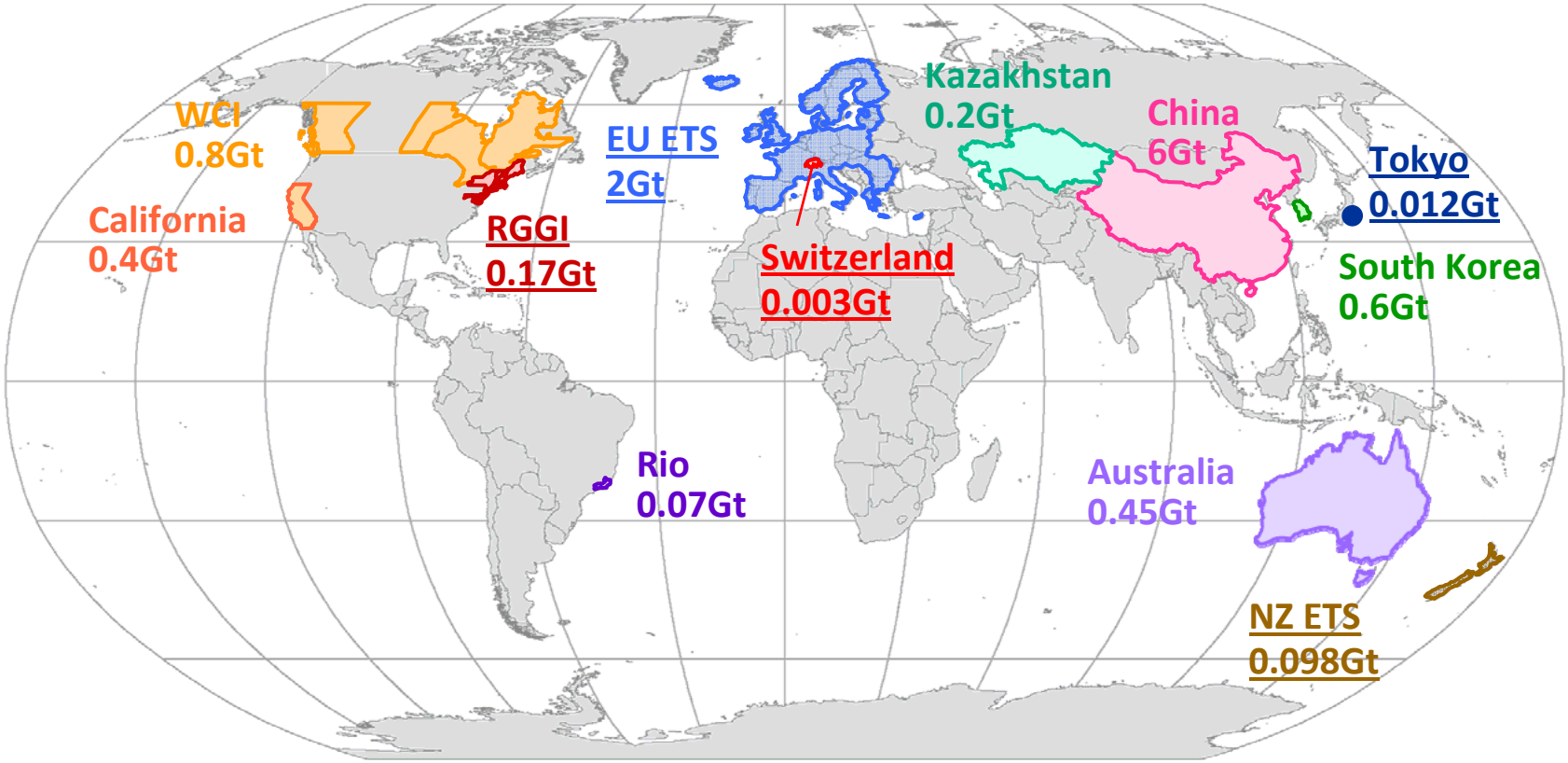


Current standing: For 2010 industrialized countries have earmarked US$ 12 billions

Brunner 2011

Efficiency and Compensation: Linking Trading Systems

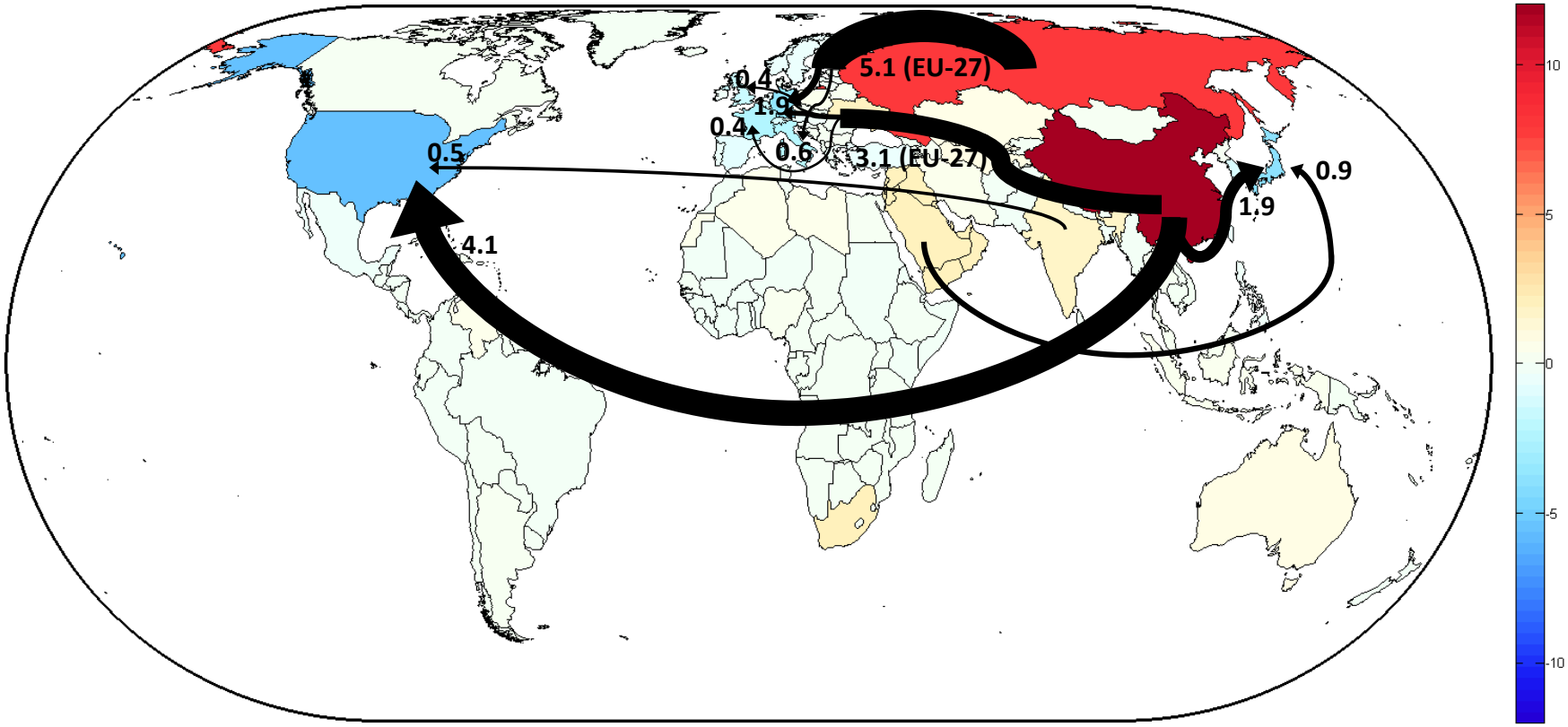
Regions having adopted or currently implementing Cap-and-trade Systems:



Flachsland 2012

Carbon Border Tariffs?

CO_2-trade balances for different world regions 1990-2008

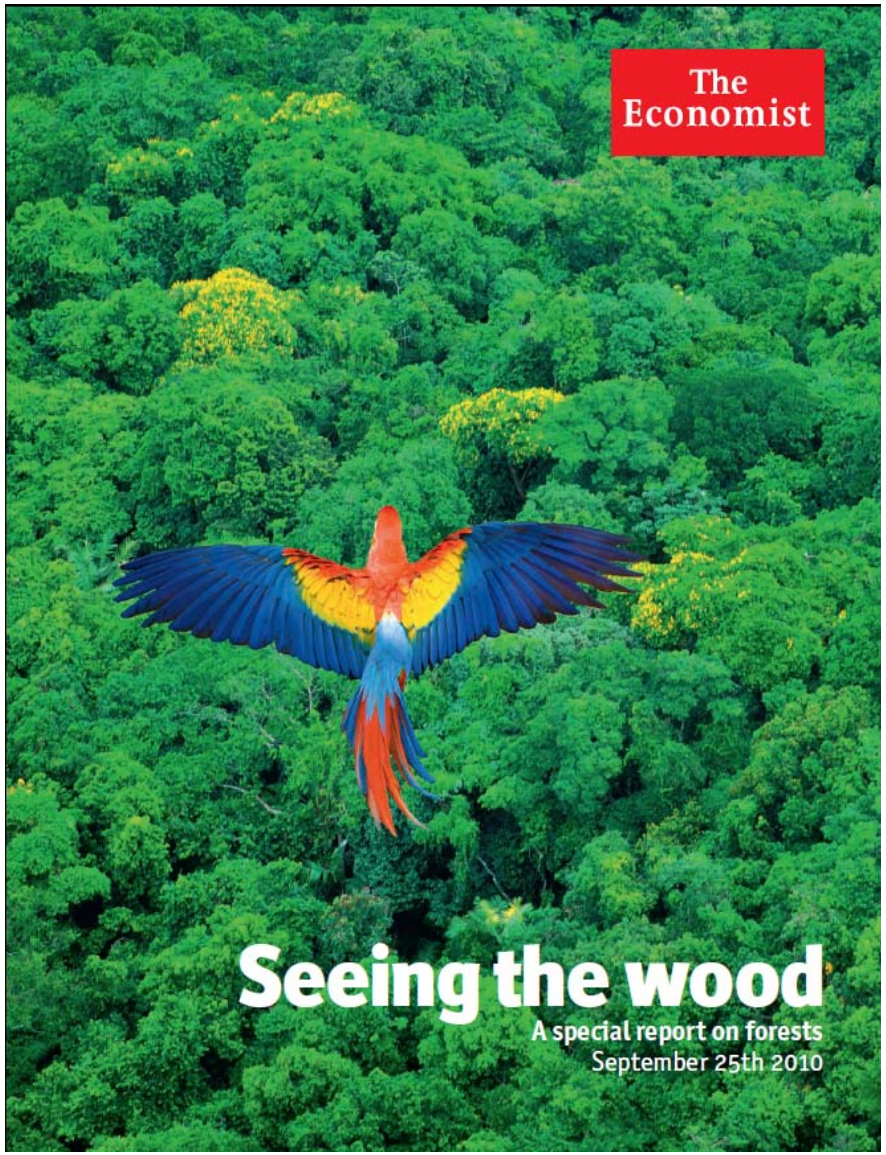


Blue: CO_2-Importing

Red: CO_2-Exporting

Peters, Minx, Weber, Edenhofer (2011)

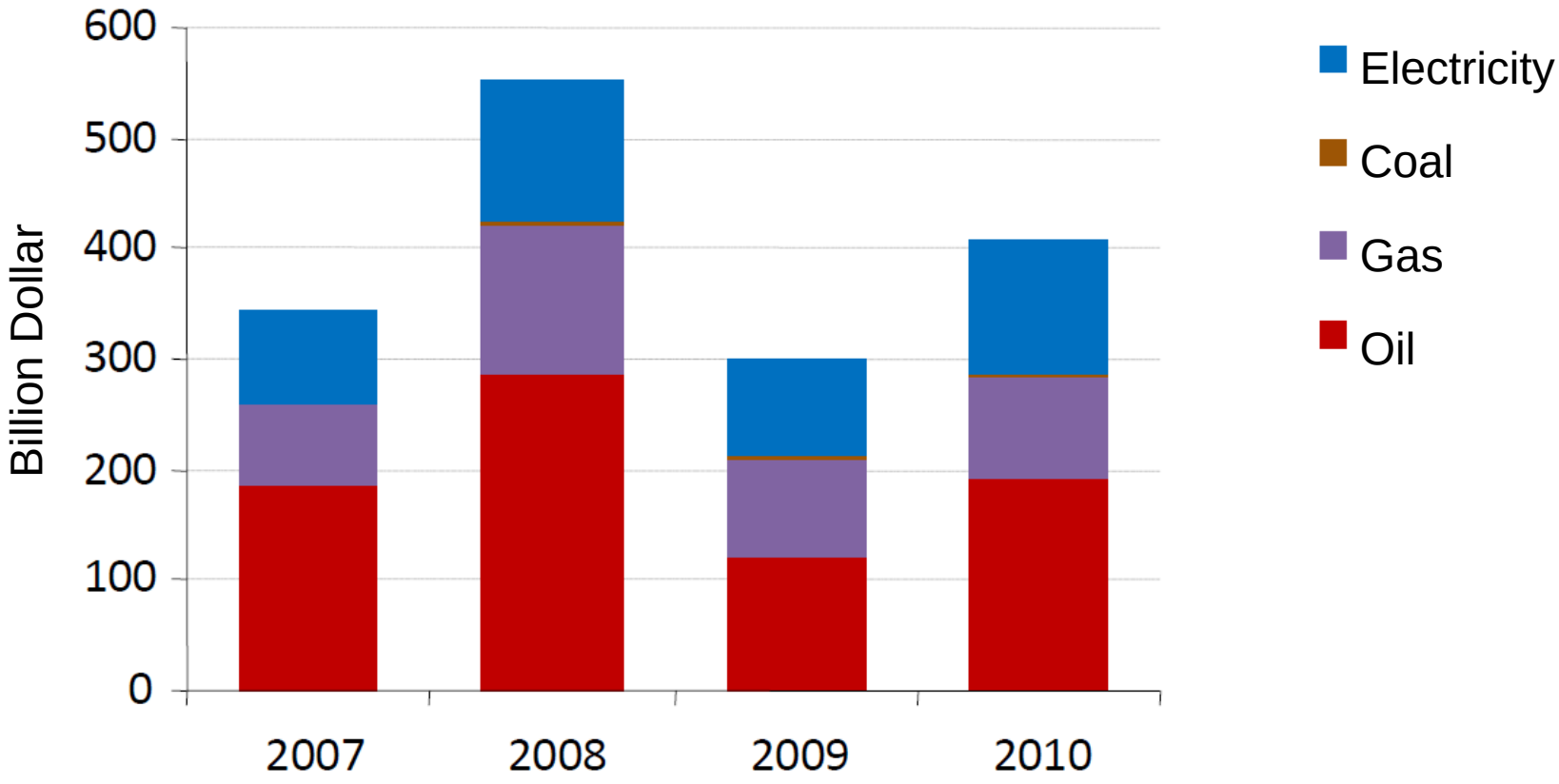
Better REDD than Dead



No regret policies – Reducing fossil fuel subsidies

Global Subsidies for Fossil Energies: 409 Billion $ in 2010

[= Average Subsidy of 9$ per Ton of CO_2]



International Energy Agency 2011

Mercator Research Institute on Global Commons and Climate Change

Associates:

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Director:
Ottmar Edenhofer

WG 1	WG 2	WG 3	WG 4	WG 5
Economic Growth	Resources and International Trade	Land-use, Infastructure and Transport	Governance	Assessment Reports and Scientific Policy Advice

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= Global Commons + Transformation Pathways