

Challenges in Scaling up Clean Energy

In the end, its investment that counts

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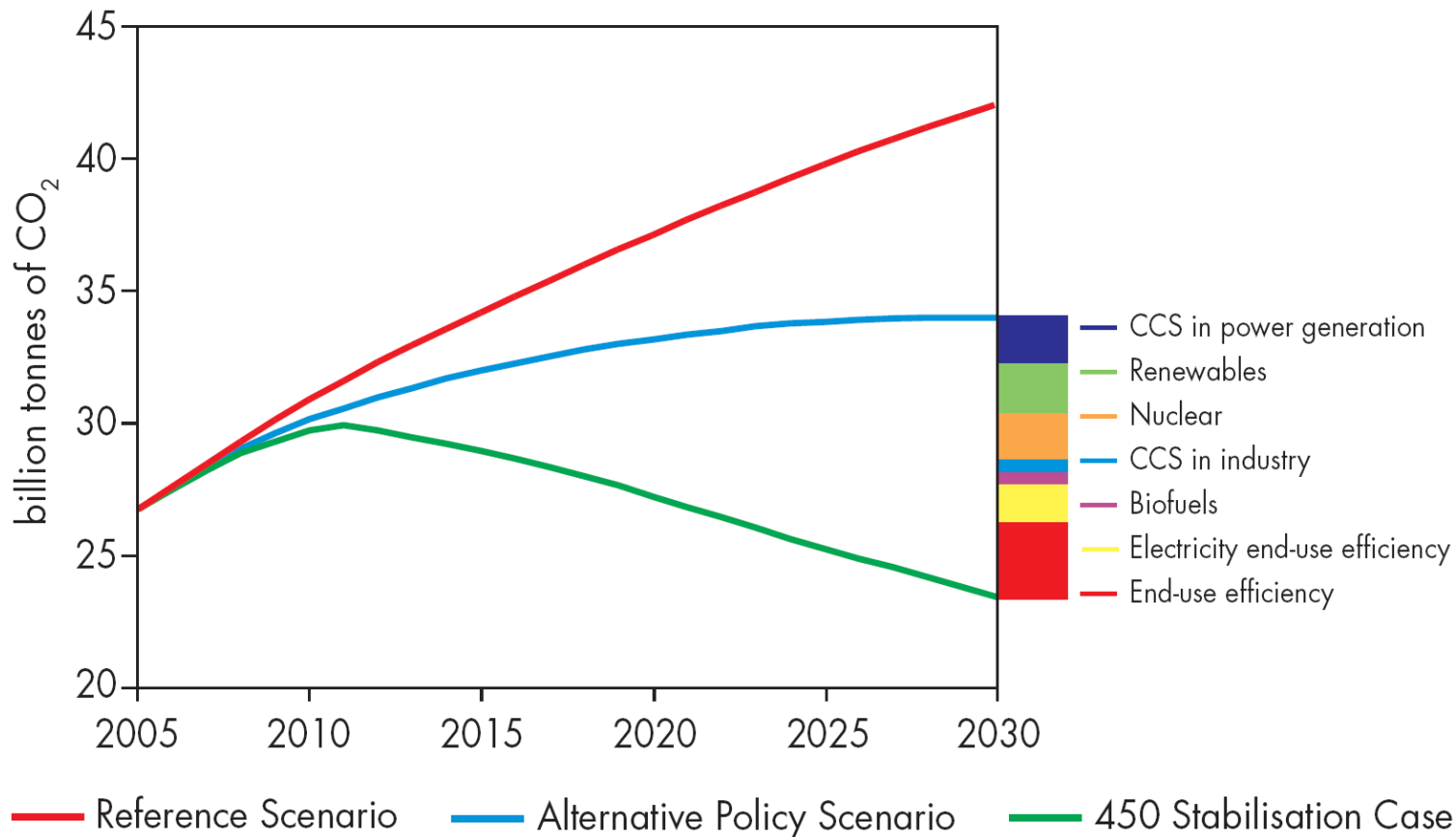
Die Zukunftsförderer



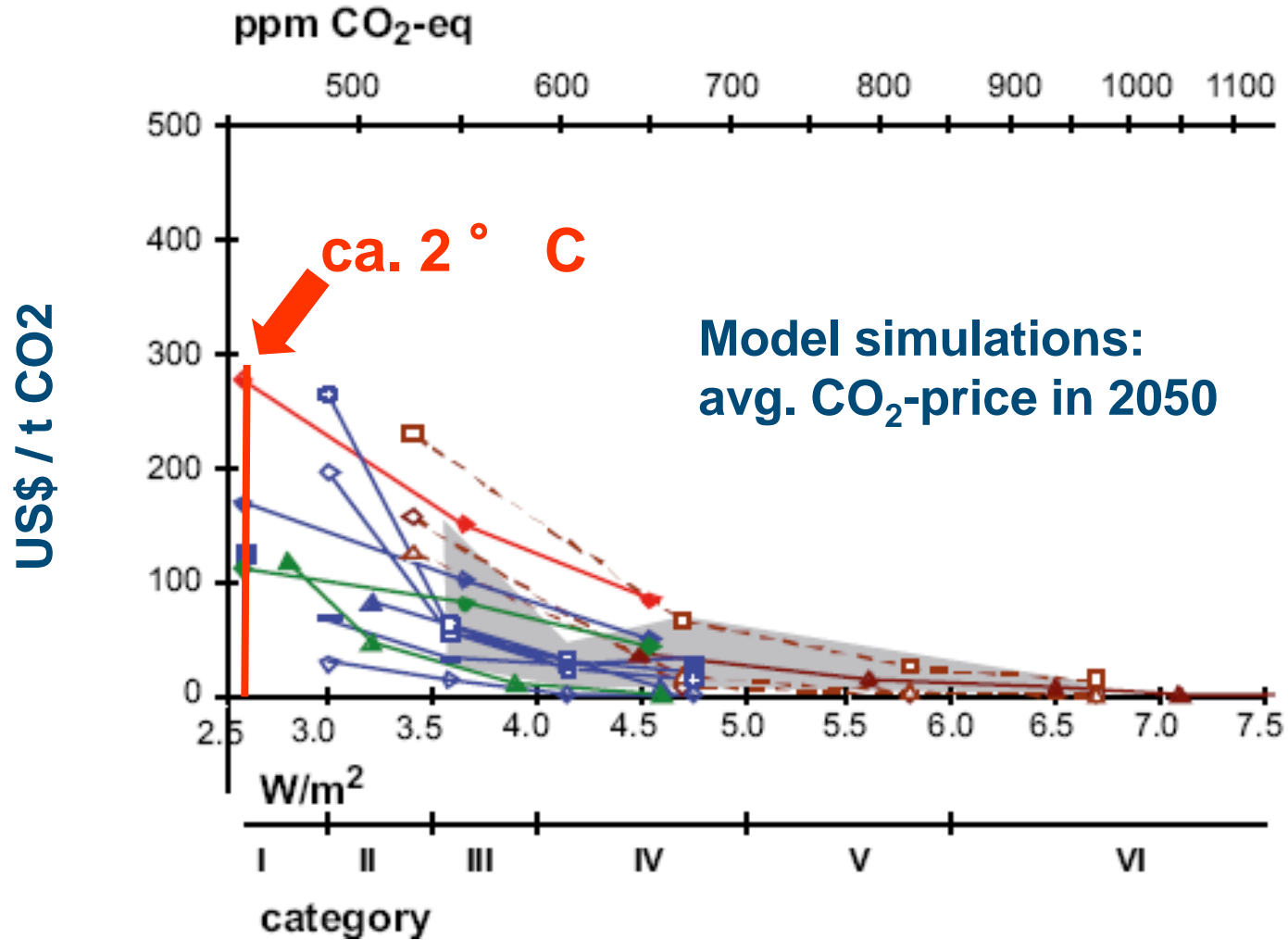
1. **A Consistent 2 ° C-Scenario ?**
2. **Learning the Hard Way: International Climate Policy**
3. **Price Signal & Investment Decision**

What does stabilization mean ?

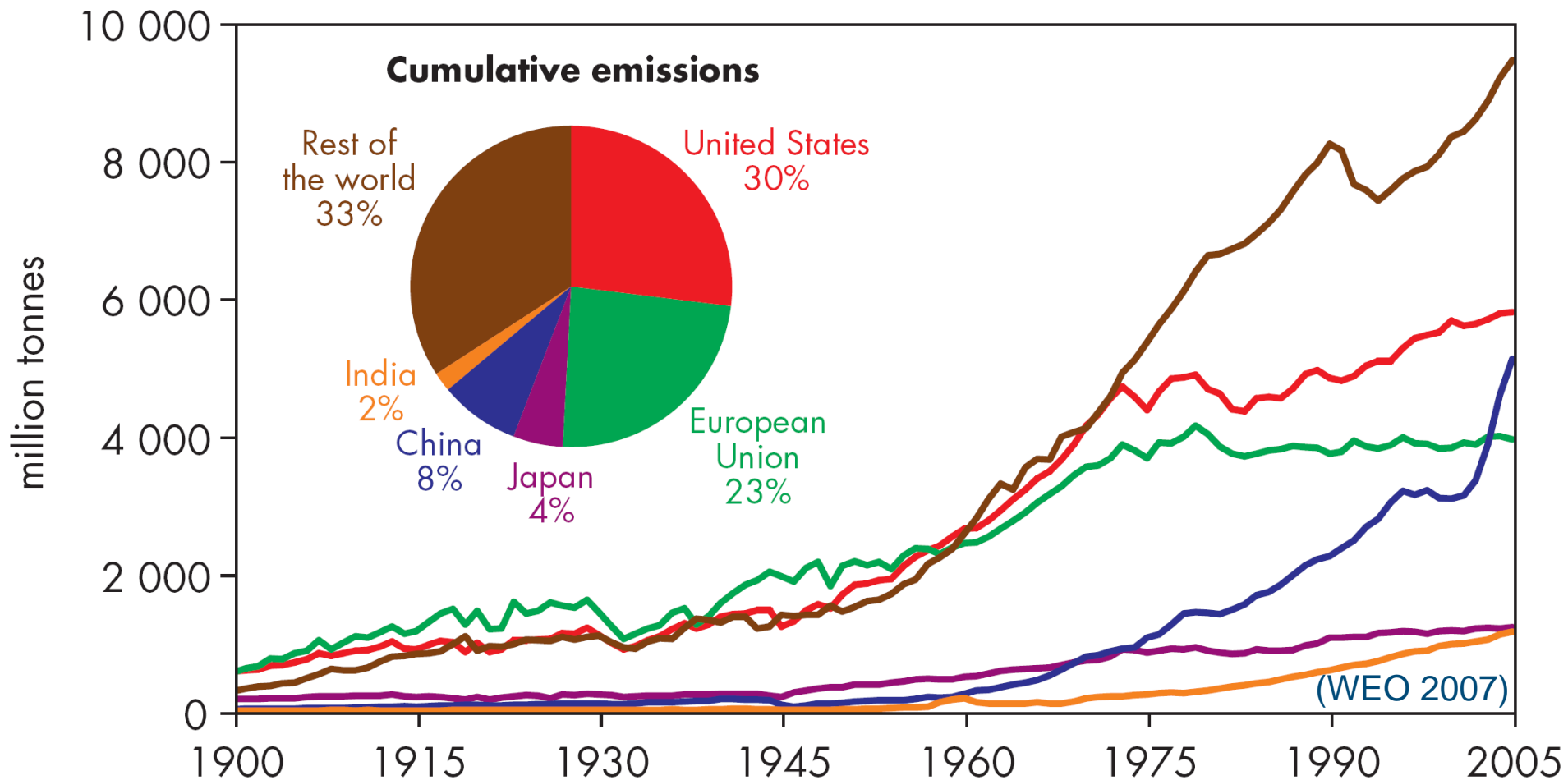
Emissions for 450 ppm CO₂ eq stabilization



Consistent Carbon Values



Energy related CO₂ emissions per region



Two Dilemmata of Climate Policy

Efficiency

Costs: individual
Benefit: public good

Justice

Polluters suffer less
from damage

Energy Sector:

**Investments in
„all“ countries**

Who pays ?

Framework Convention on Climate Change (1992, Rio)

- 189 countries (incl. USA)
signed & ratified

Kyoto Protocol (1997, Kyoto)

- 165 countries
(of which 35 Annex I)
- Binding targets
(Annex I)
- In force
since Feb. 2006

Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol



Source: <http://untreaty.un.org/ENGLISH/bible/englishinternetbible/bible.asp>

UN Climate Process - Impressions ...



Goal formulated - Path remains unclear ...

Ambitious long-term
goal (2° C)



No targets for DC
(but: registers)

„Abstract“ (30/100)
financing commitment



No formalized support
mechanism

Complex Negotiations

Multi-level

- Departments
- Nat. Govt.
- EU / G77&C / ...
- UNFCCC



Sequential

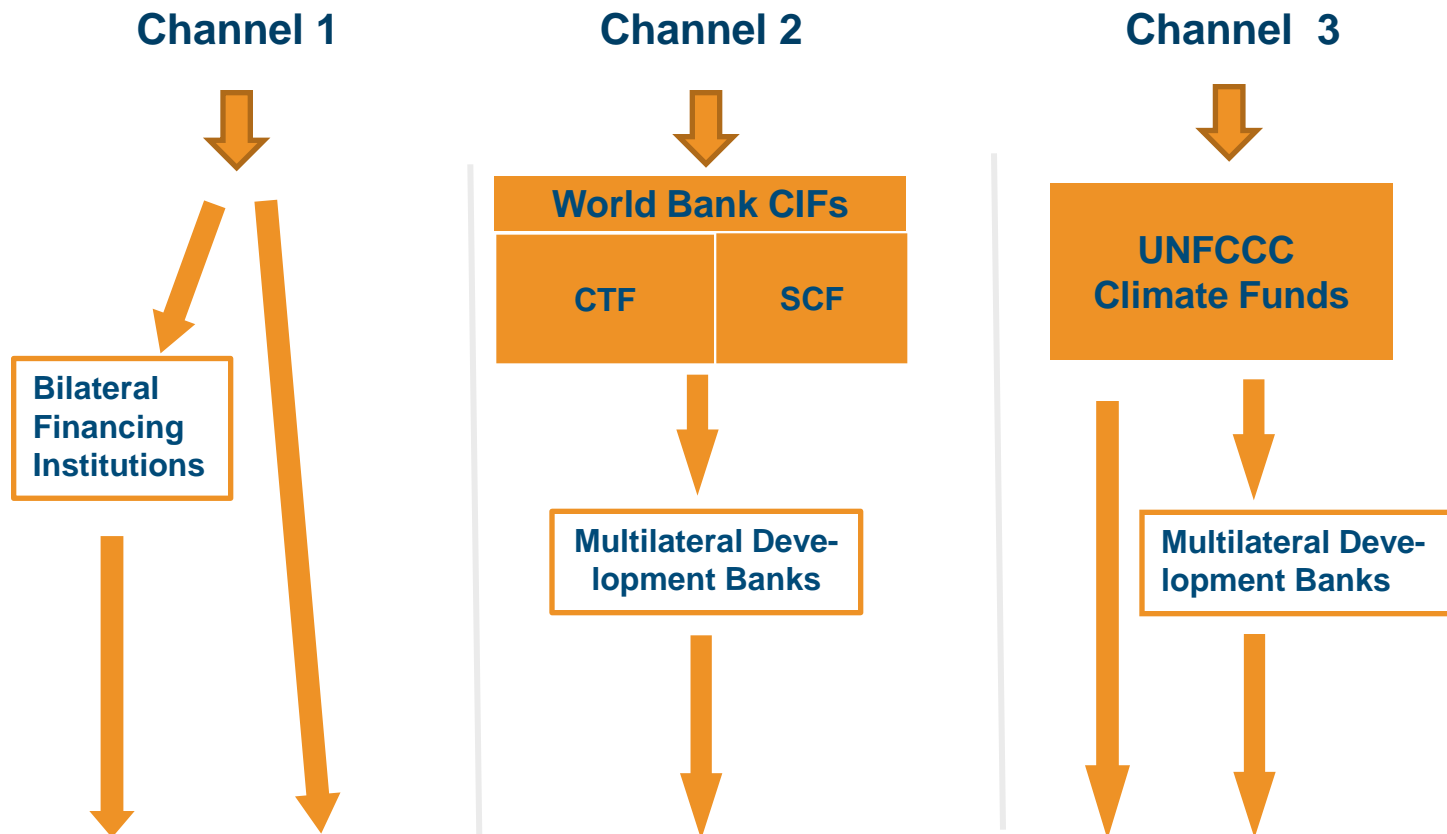
Multi-dimensional

- Mitigation
- REDD
- Technology
- Adaptation
- **Finance (!)**

> 160 Inhomogeneous Parties

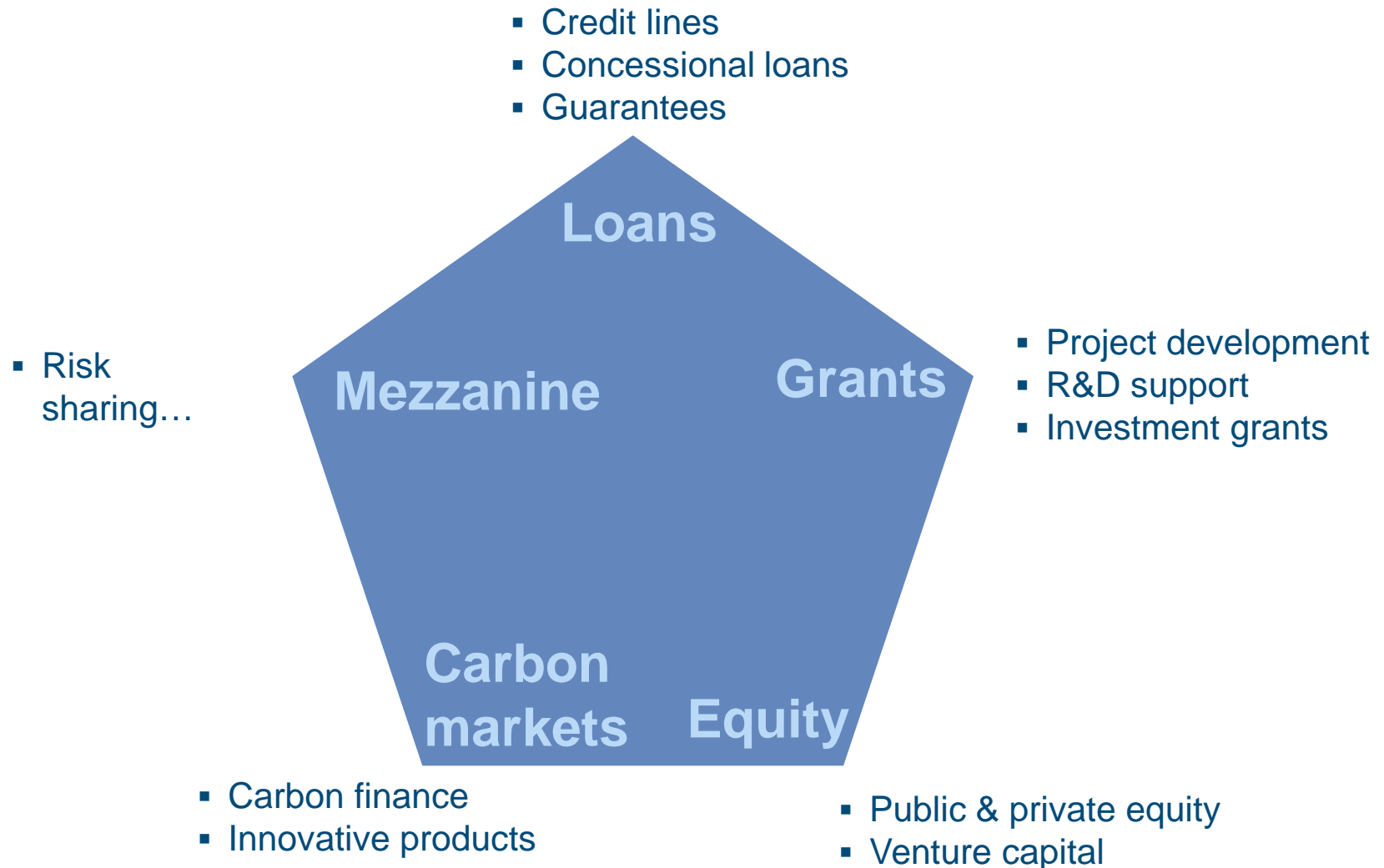
- GDP
- Emissions
- Annex1 / Annex2

International Sources of Finance



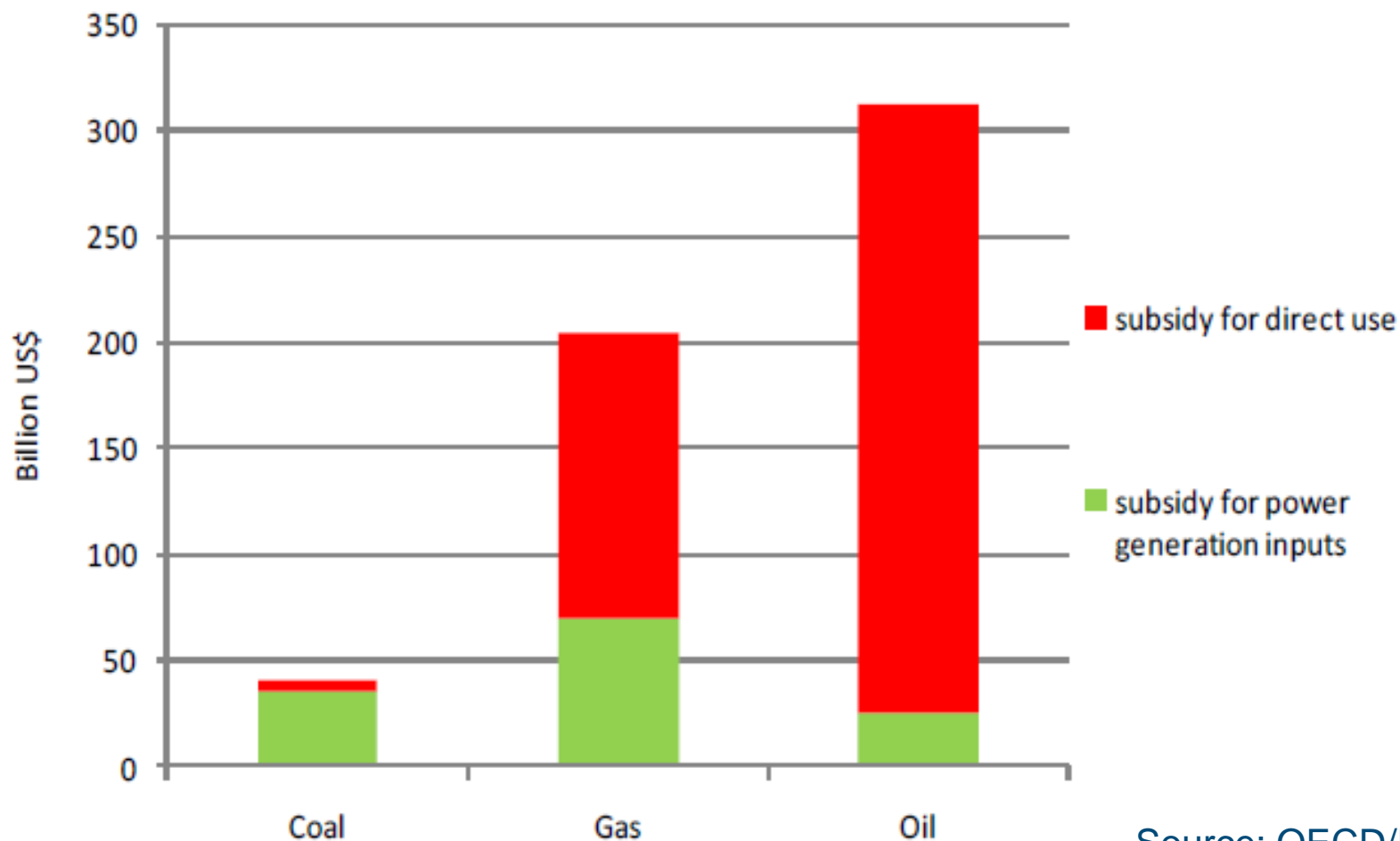
Developing Countries: Budgets, Programmes, Projects, Companies, Civil Society

Full Menu of Public Finance Mechanisms



Major non-topic: Energy Subsidies

Subsidies to Energy Use (2008)



Source: OECD/IEA (2010).

Carbon Price Signals ?

Global

- Efficient abatement difficult
- CDM – future development
- International Climate Finance

Regional

- EU Trading Scheme (& others)
- “Green”-Permit-Schemes
- Emission Taxes
- Feed-in-Schemes
- Other Subsidies

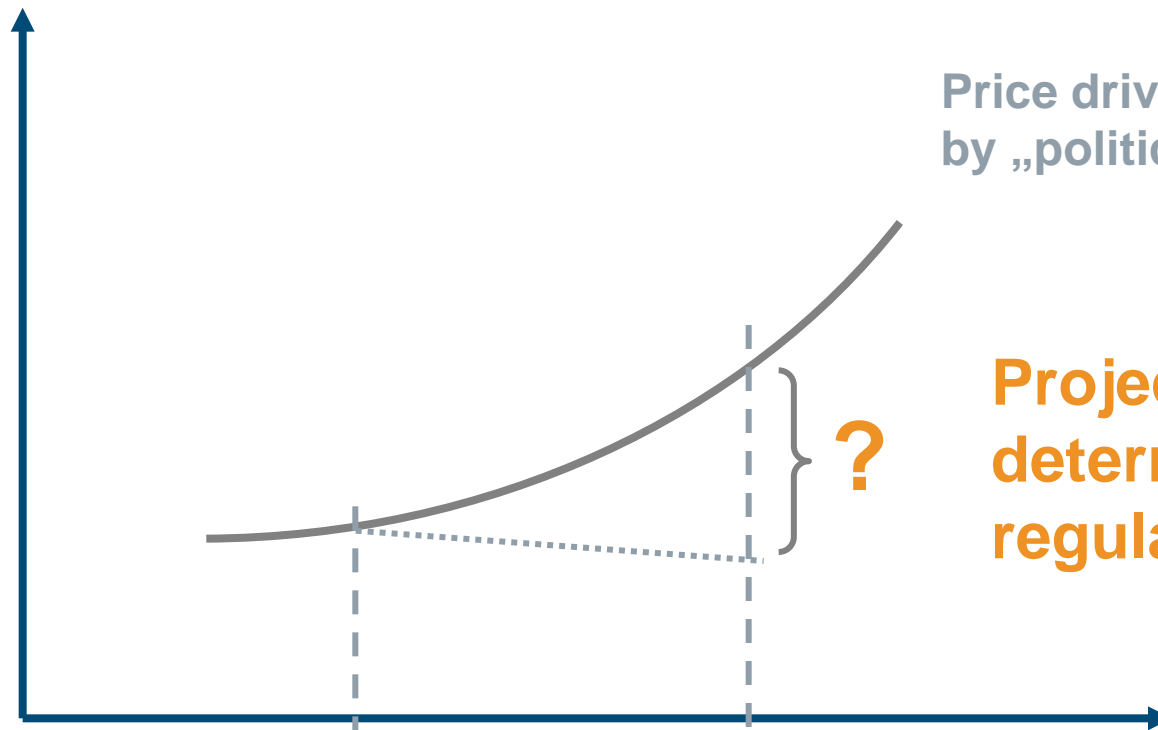
Do price signals act as they are supposed to?

What is appropriate for developing countries?

Value of Carbon over time...

... and what it may mean for sustainable energy project finance.

CO₂ price



Price driven up
by „political scarcity“

**Project cash flow
determined by
regulation !**

Investment
decision

Investment
lifetime

time

UN Process

- How to raise large amounts of public funds? (Innovative financing mechanisms)
- Climate finance architecture: collect & distribute the funds (centralized, decentralized, bilateral, multilateral, ...)

More general: Climate and „New Public Finance“

- Leveraging private money with public funds
- Instruments? Investment subsidies, guarantees, feed-in-tariffs, emissions trading
- Key question: Does the price signal arrive at the investor

Financing Energy gains importance: Any scenario with objectives anywhere near 2° C involves major structural change / energy investments.

UN Process not yet the power to create a good quality carbon price signal.

Policy & regulation driving profitability of clean energy projects & regional carbon price signal.

Carbon Market intertemporally incomplete.

“Investment hot-spots” in difficult regions.

How can the impact of efficient, market based instruments be extended to the BRICS countries ?

Don't hesitate to contact us!



Thank you !

Ulf Moslener

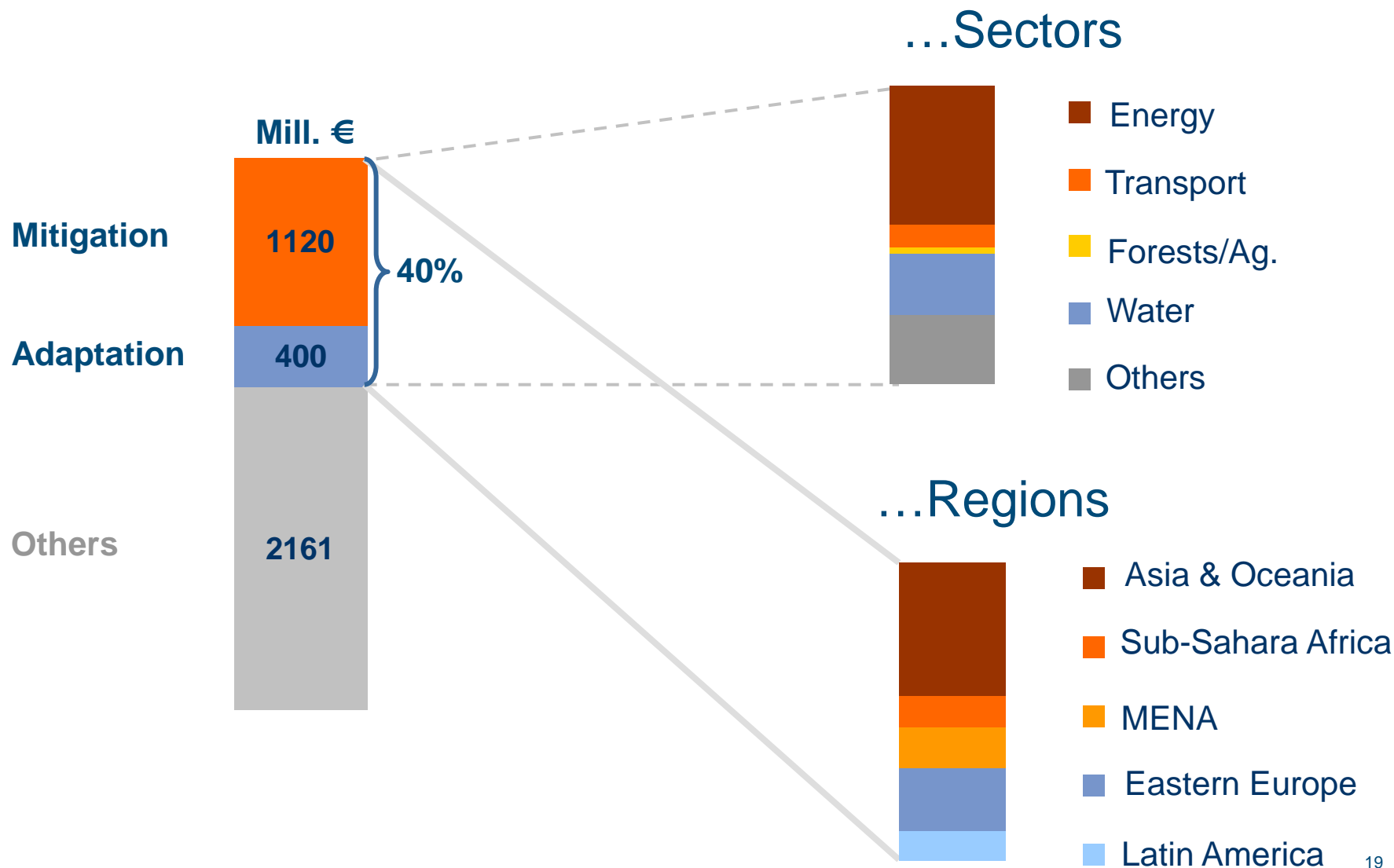
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Climate Finance – Commitments

KfW Development Bank 2008



Praxisbeispiele unserer Arbeit

Energieeffizienz

Energetische Wohnraumsanierung
in Osteuropa



Erneuerbare Energie

Geothermie in Kenia



Biodiversität und Waldschutz

„Grüne Sparbücher“ –
Wiederaufforstung in Vietnam



Anpassung

Wassermanagement in Jordanien

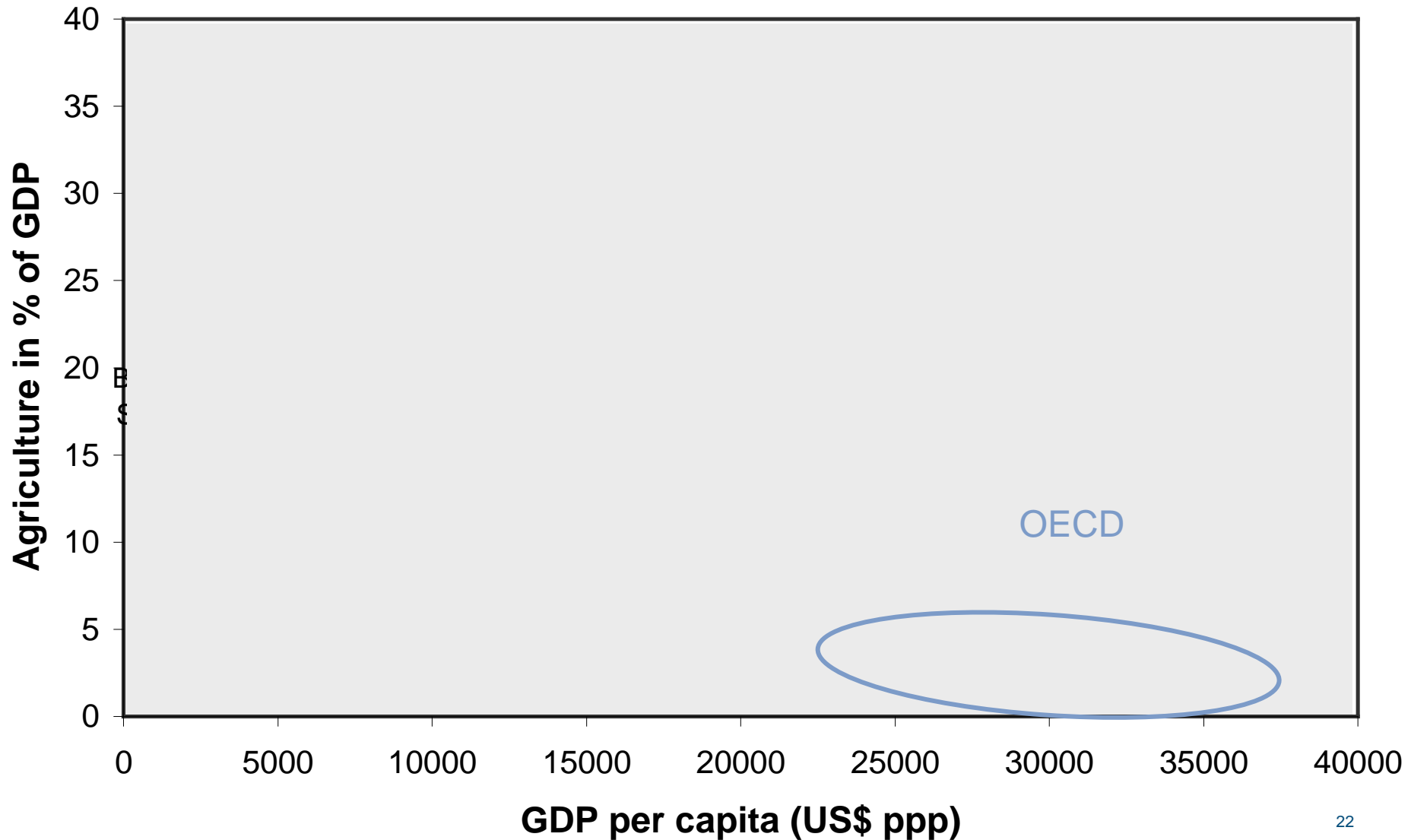


Capital needs are concentrated in a limited number of ‘investment hotspots’

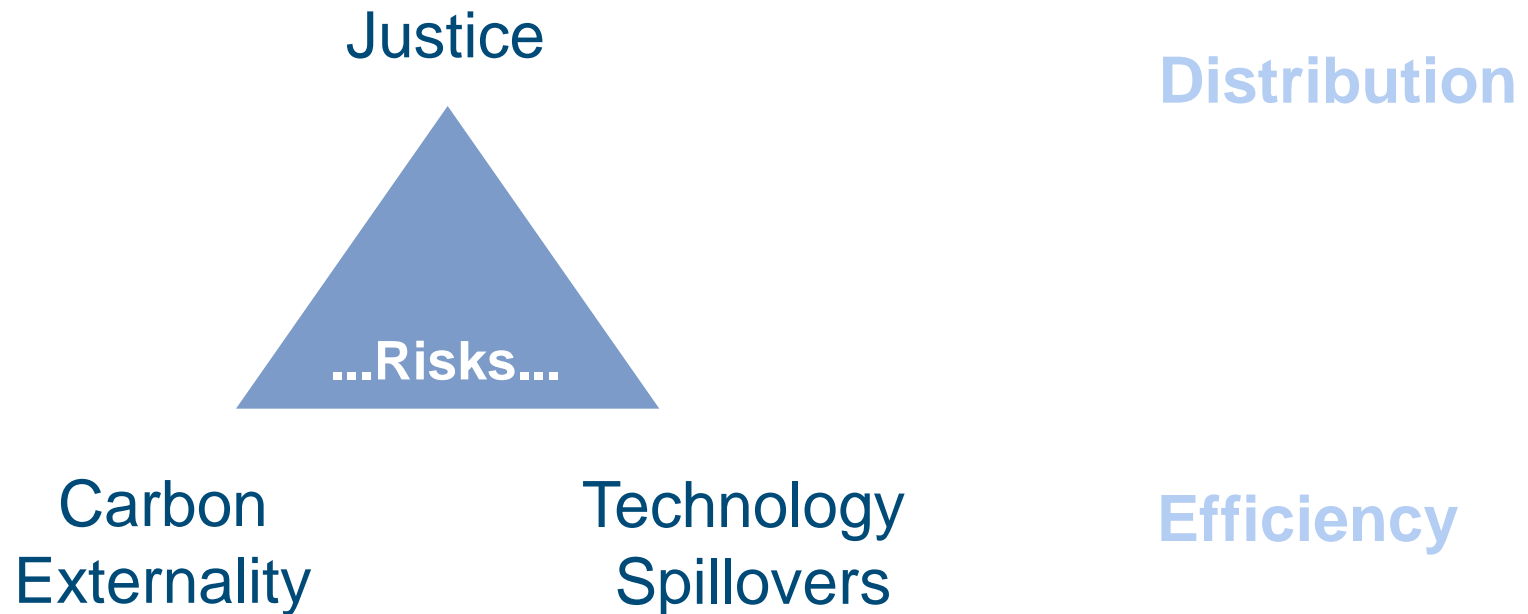
Total investment capital needs under Copenhagen Accord low abatement scenarios; 2010–20; USD billion p.a.

Sectors	Nations										Total
	China	India	Middle East	Rest of developing Asia	Brazil	Mexico	Rest of Latin America	South Africa	Rest of Africa	Rest of Eastern Europe	
Power	51.0	10.0	0.6	3.3	0.0	1.6	0.7	3.5	0.1	1.5	72.3
Transport	3.5	0.8	0.0	0.6	0.8	0.6	0.2	0.2	0.1	0.2	7.0
Buildings	4.2	0.2	0.4	0.2	0.4	0.2	0.1	0.0	0.2	0.3	6.2
Iron and Steel	5.2	0.7	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.2	6.7
Chemicals	3.5	0.7	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	4.7
Waste	0.6	0.2	0.2	0.7	0.1	0.5	0.1	0.1	1.1	0.1	3.7
Petroleum and gas	0.6	0.2	0.5	0.3	0.1	0.1	0.3	0.0	0.1	0.1	2.3
Cement	-6.6	-1.4	-0.4	-0.7	-0.2	0.0	0.0	-0.1	-	-0.2	-9.6
Other Industry	9.4	1.8	-	1.5	0.0	-	-	0.2	0.0	-	13.0
Forestry	0.1	-	0.0	0.5	0.1	0.0	0.1	0.0	0.2	-	0.9
Agriculture	-	-	-	-	-	-	-	-	-	-	-
Grand total	71.4	13.1	1.4	6.7	1.9	3.1	1.6	4.0	1.9	2.3	107.4

GDP-Exposure to Climate



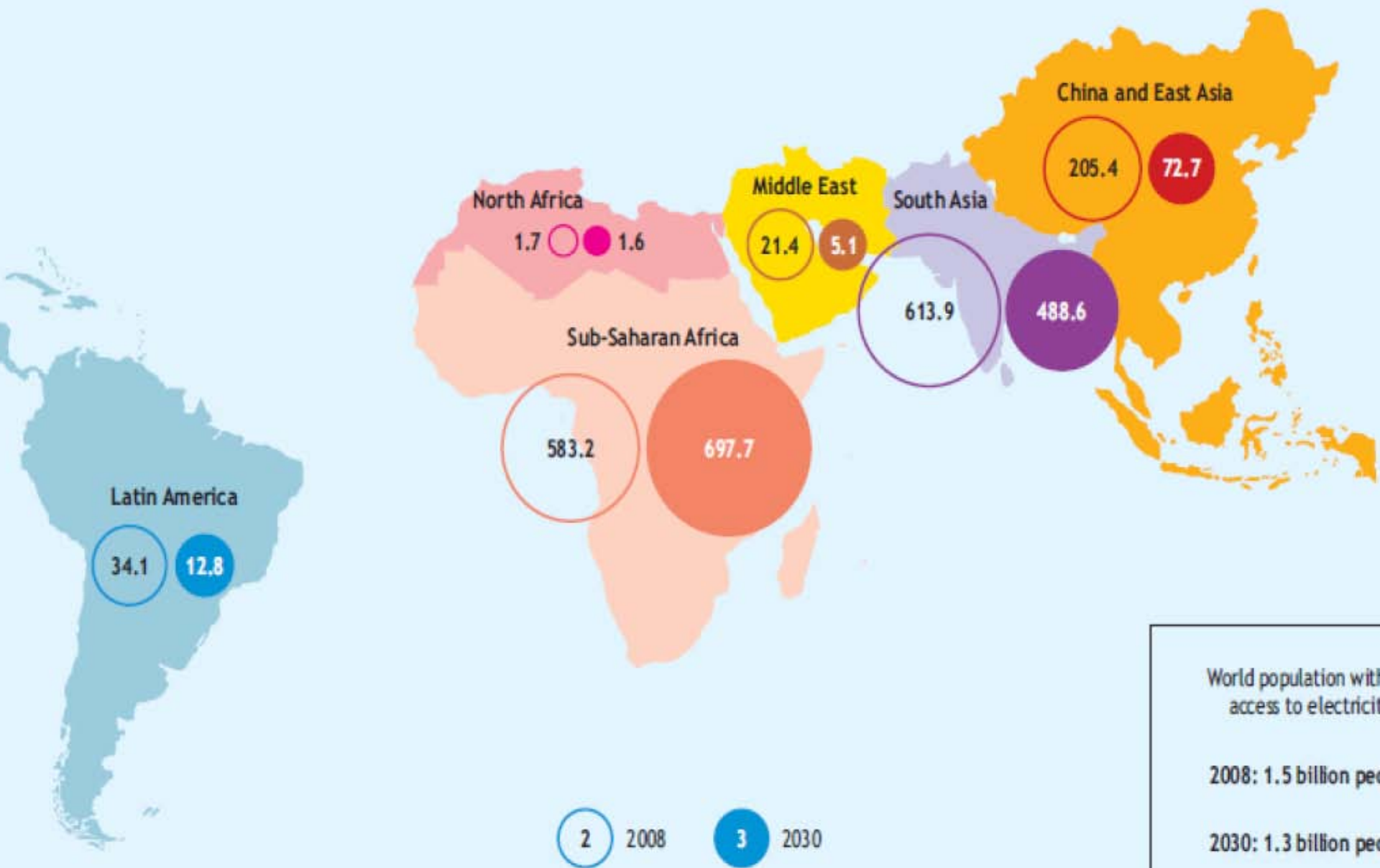
Three issues motivate policy-intervention



Any policy intervention may affect all three issues !

- | | |
|---------------------------------|-----------------------|
| 1. Emission tax | CO ₂ , ... |
| 2. Emissions trading | CO ₂ , ... |
| 3. Feed-in-tariffs | Renewables |
| 4. „Green“ permits | Renewables |
| 5. Grants, loans, guarantees... | Whatever „wanted“ |

today and projected in 2030 (millions)



Priorities – Indicative Examples

EU	USA	China
<ul style="list-style-type: none"> ▪ Temp. rise < 2° C 	<ul style="list-style-type: none"> ▪ Growth 	<ul style="list-style-type: none"> ▪ Growth
<ul style="list-style-type: none"> ▪ Absolute targets <ul style="list-style-type: none"> ▪ targets (<i>market pull</i>) <ul style="list-style-type: none"> - Emissions - Quota (ren power, Biofuels) - Energy-efficiency 	<ul style="list-style-type: none"> ▪ Relative targets (e.g. GDP) ▪ Technology → R&D (<i>technology push</i>) ▪ Private sector focus 	<ul style="list-style-type: none"> ▪ Relative targets (e.g. GDP) if at all ! ▪ Technology (co-operation)
<ul style="list-style-type: none"> ▪ OECD – historical responsibility 	<ul style="list-style-type: none"> ▪ Only if: China, India included 	<ul style="list-style-type: none"> ▪ Historic & per capita emissions low
<ul style="list-style-type: none"> ▪ Inclusive, multilateral frame 	<ul style="list-style-type: none"> ▪ Multilateral: inefficient; smaller clubs (e.g. AP6) 	<ul style="list-style-type: none"> ▪ Informal leadership