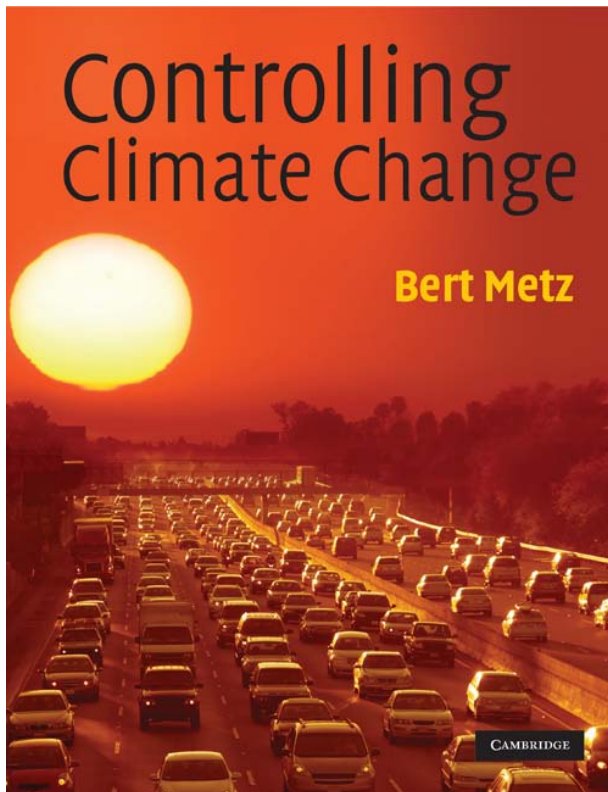


Controlling climate change after Copenhagen

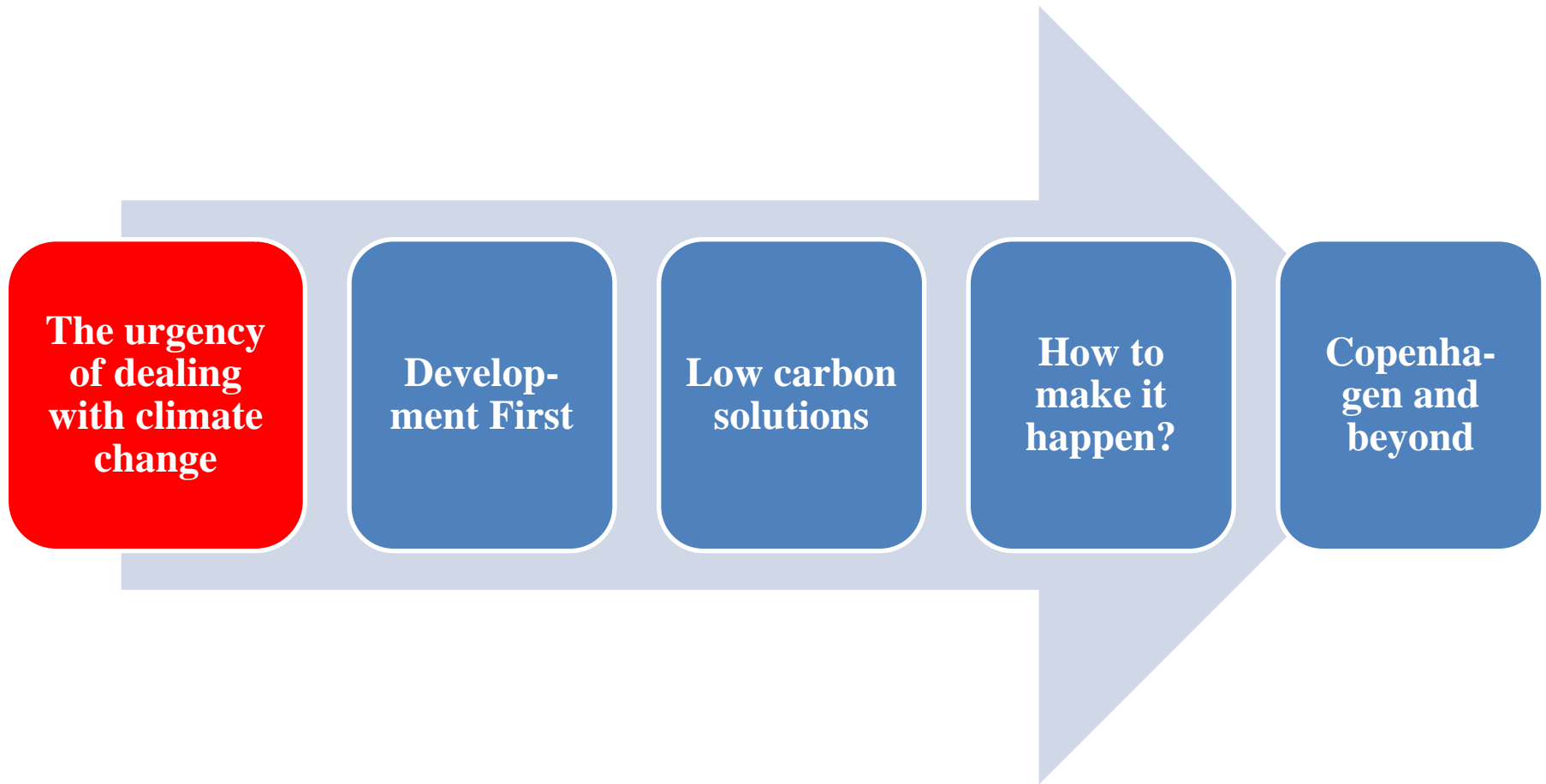


Dr. Bert Metz

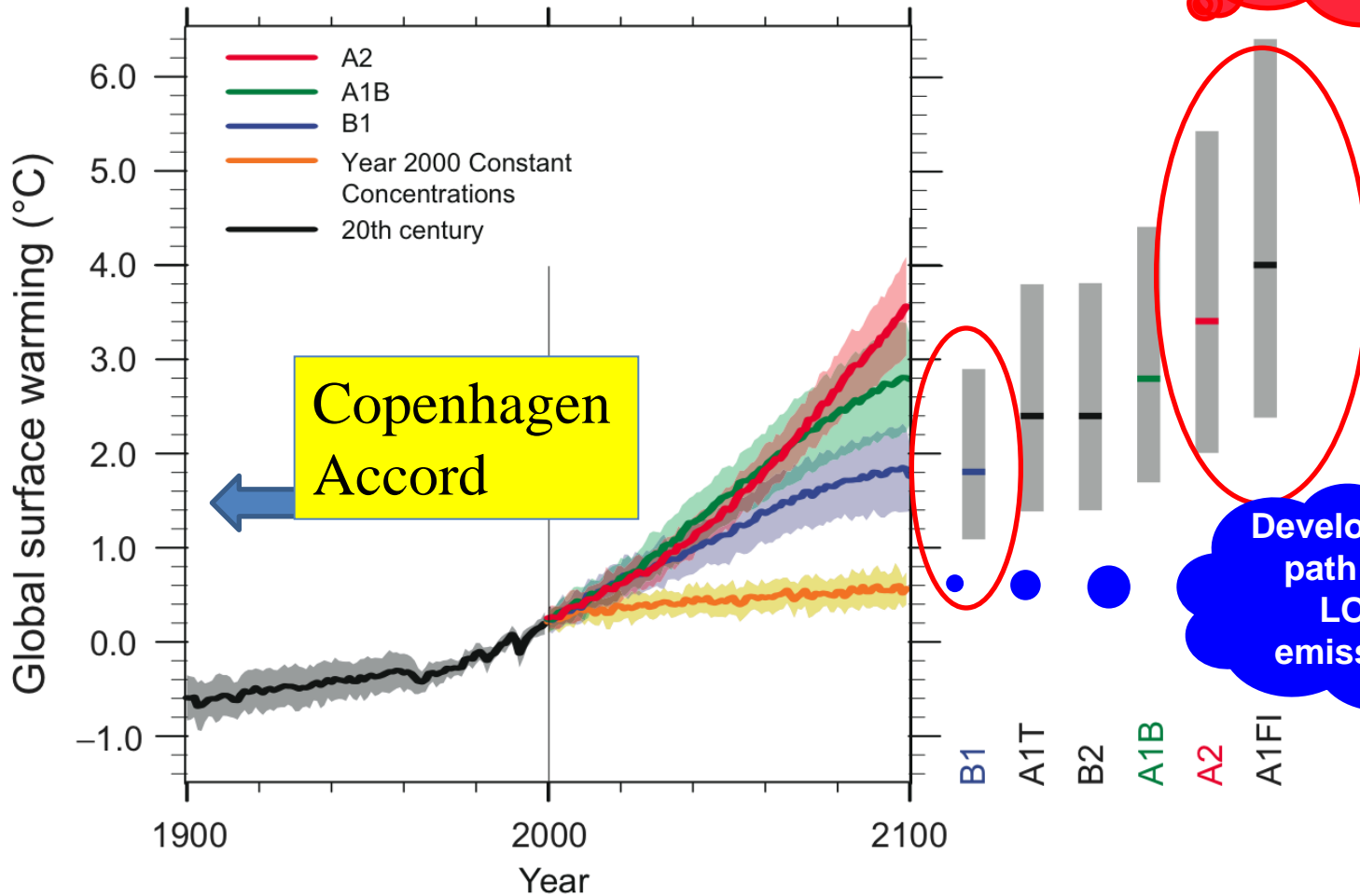
Former Co-chairman IPCC Working Group III

Fellow, European Climate Foundation

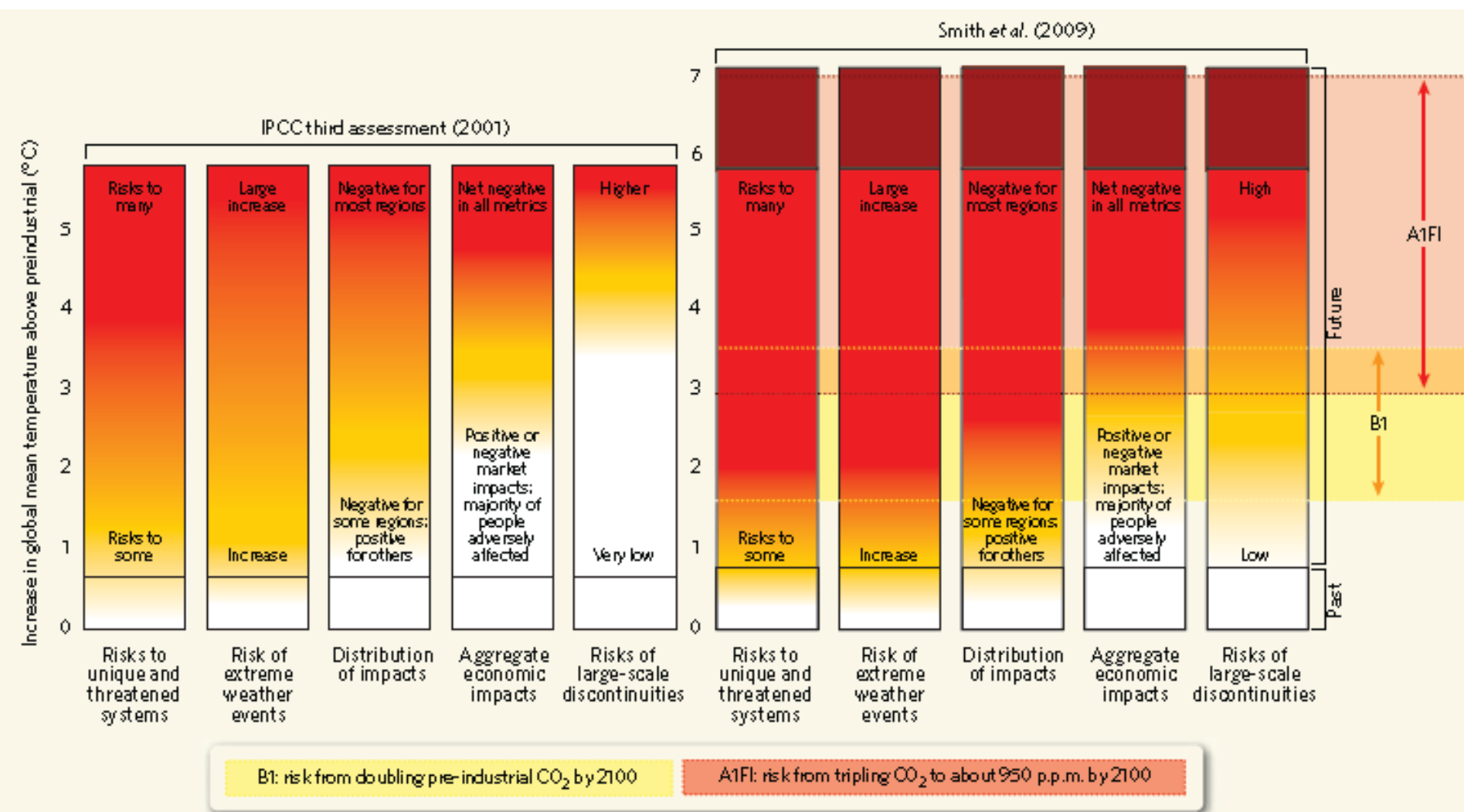
Issues



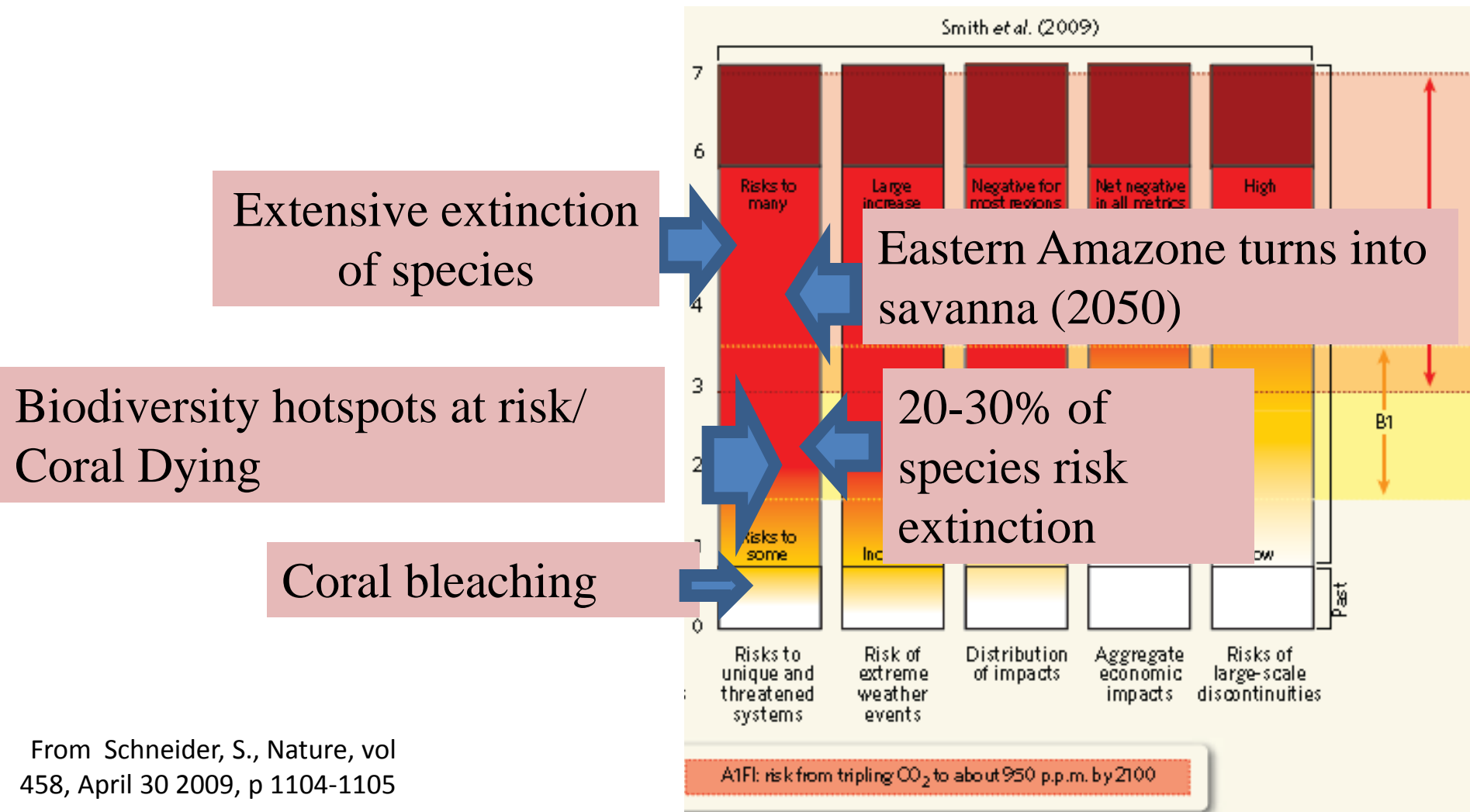
Projected climate change



Climate change risks now seen as more serious

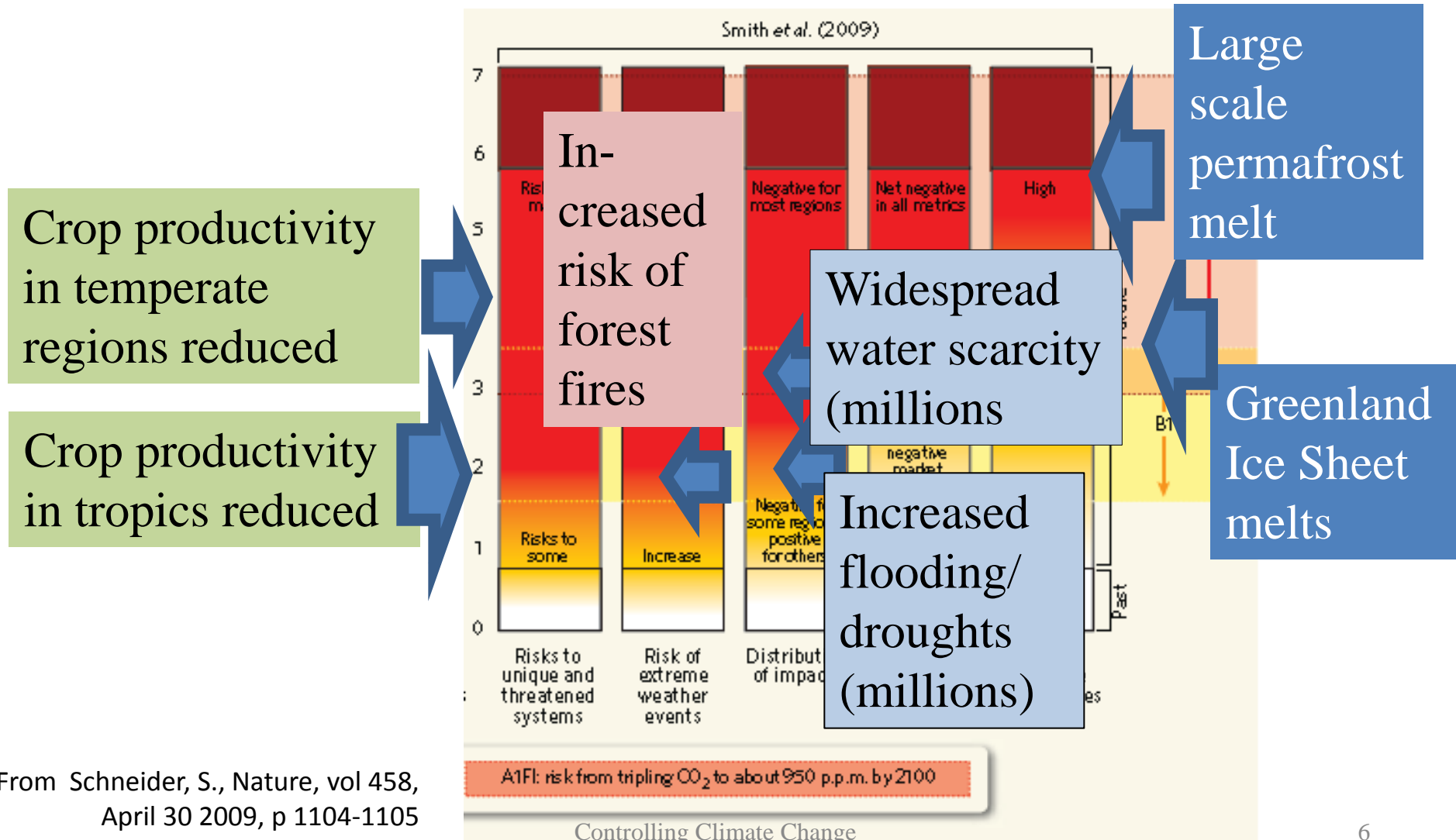


Climate change risks now seen as more serious



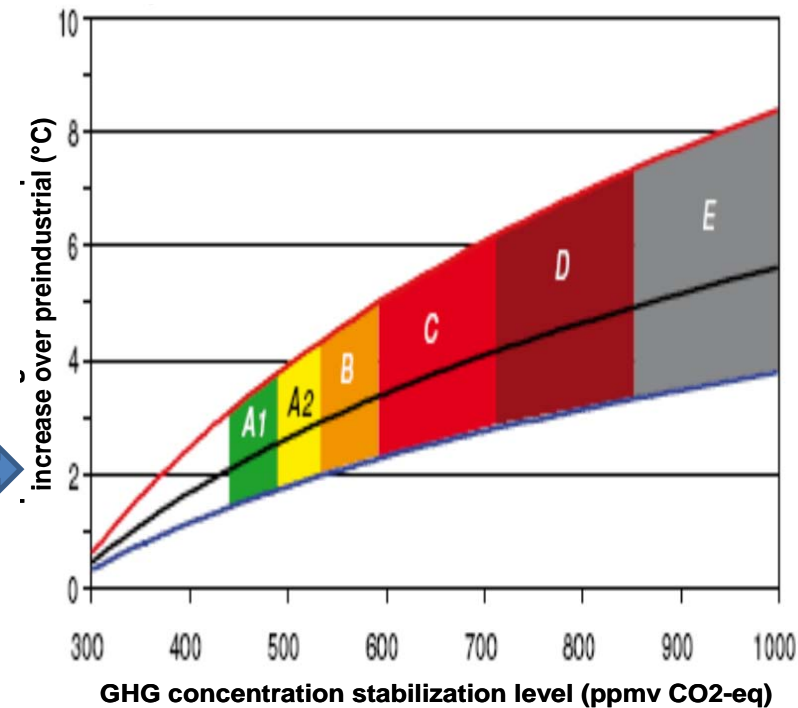
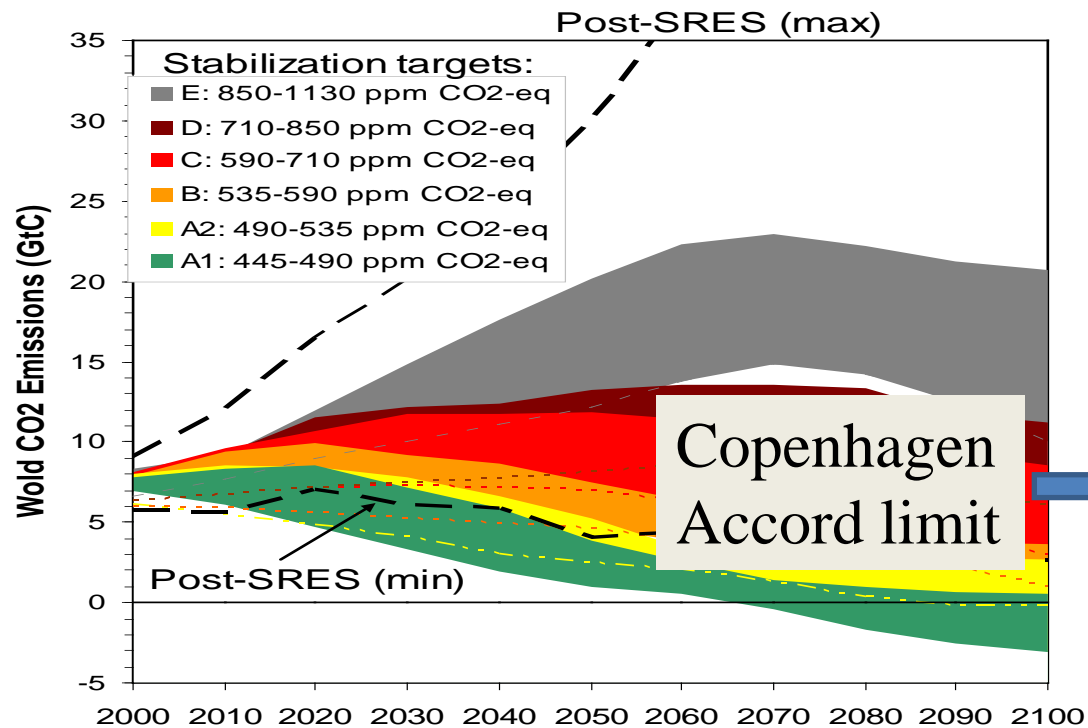
From Schneider, S., Nature, vol 458, April 30 2009, p 1104-1105

Climate change risks now seen as more serious



From Schneider, S., Nature, vol 458,
April 30 2009, p 1104-1105

Where to draw the line and what that implies for GHG emissions?



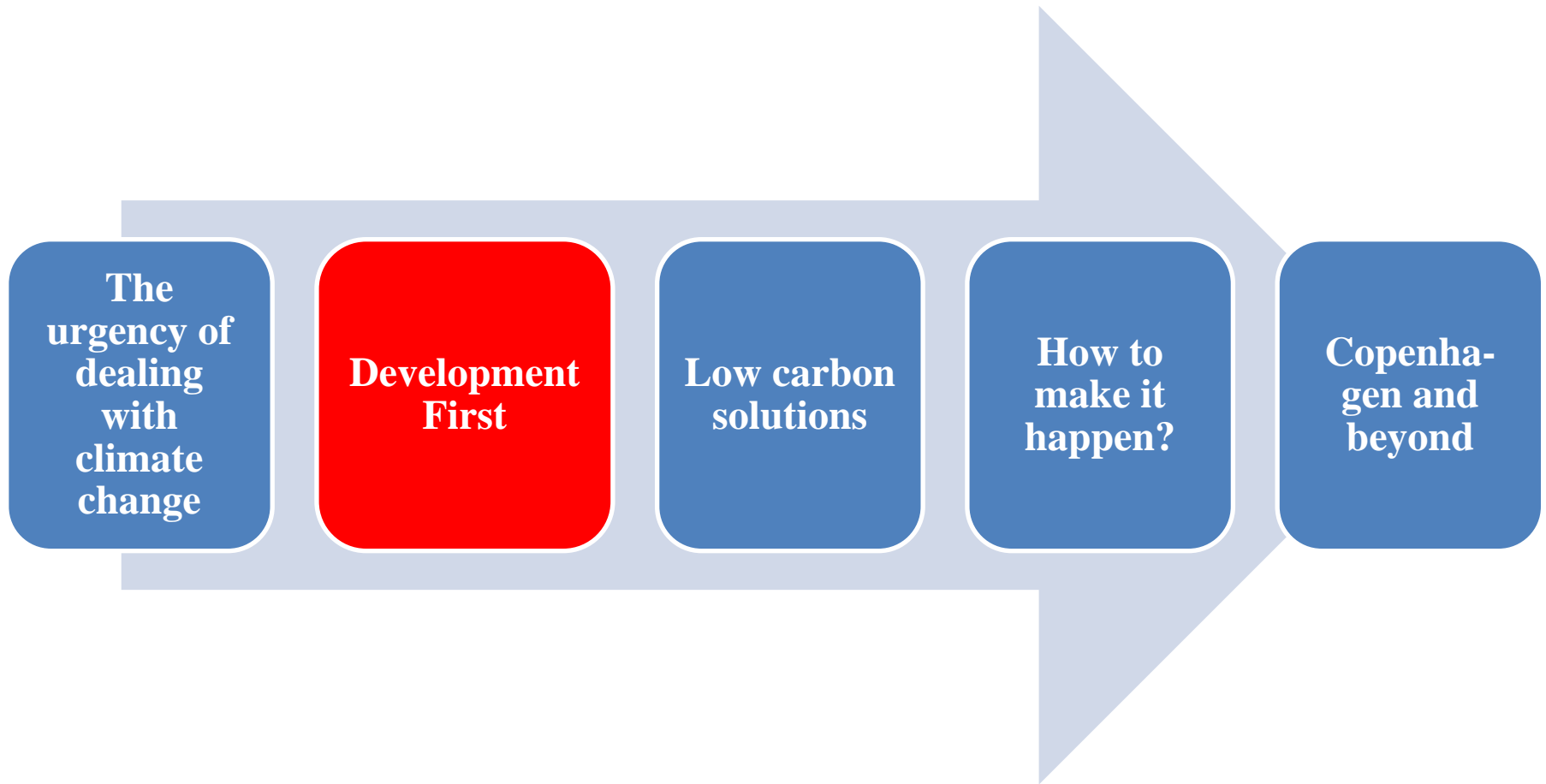
Mitigation efforts over the next two to three decades will have a large impact on opportunities to achieve lower stabilization levels

Stabilization level (ppm CO ₂ -eq)	Global Mean temperature increase at equilibrium (°C)	Year global CO ₂ needs to peak	Year global CO ₂ emissions back at 2000 level	Reduction in 2050 global CO ₂ emissions compared to 2000
445 – 490	2.0 – 2.4	2000 - 2015	2000- 2030	-85 to -50
490 – 535	2.4 – 2.8	2000 - 2020	2000- 2040	-60 to -30
535 – 590	2.8 – 3.2	2010 - 2030	2020- 2060	-30 to +5
590 – 710	3.2 – 4.0	2020 - 2060	2050- 2100	+10 to +60
710 – 855	4.0 – 4.9	2050 - 2080		+25 to +85
855 – 1130	4.9 – 6.1	2060 - 2090		+90 to +140

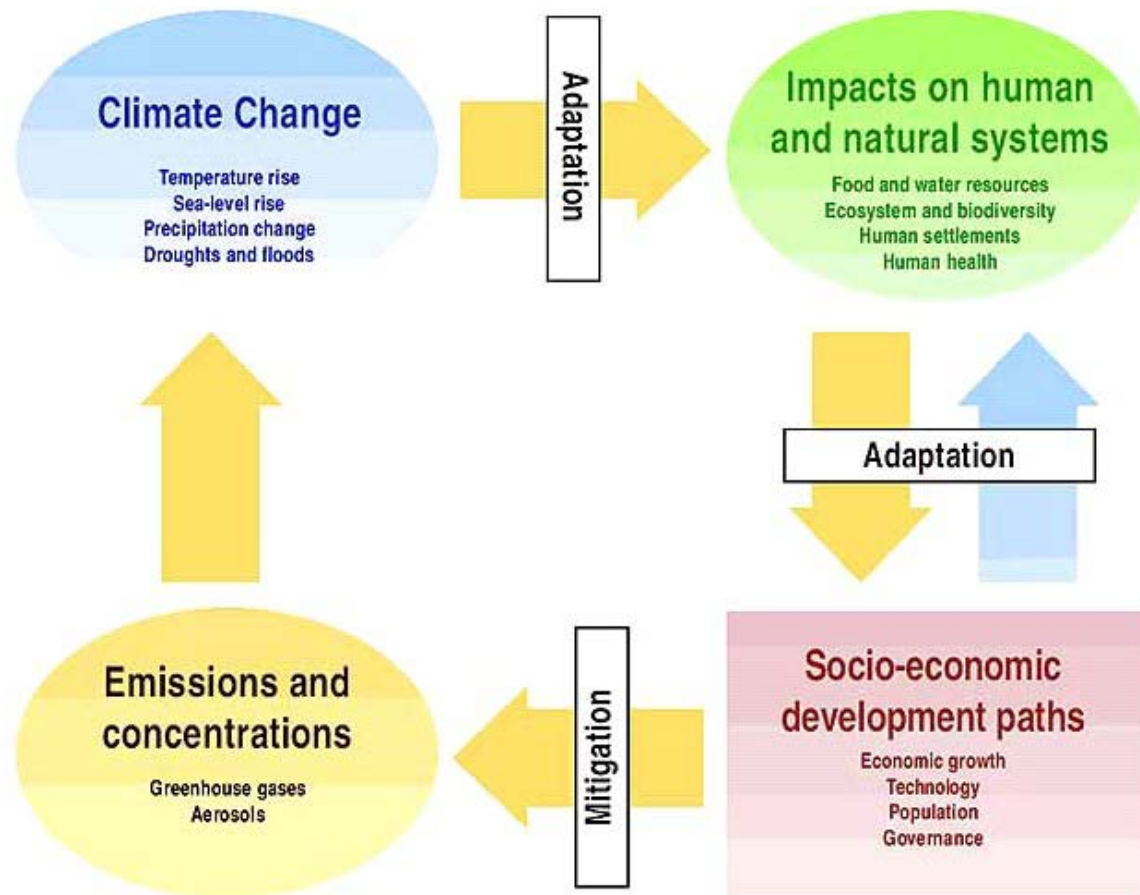
Implications for contributions by countries

Scenario category	Region	2020	2050
A-450 ppm CO ₂ -eq ²⁾	Annex I	-25% to -40%	-80% to -95%
	Non-Annex I	15-30% deviation from baseline in Latin America, Middle East, East Asia	Substantial deviation from baseline in all regions
B-550 ppm CO ₂ -eq	Annex I	-10% to -30%	-40% to -90%
	Non-Annex I	Deviation from baseline in Latin America and Middle East, East Asia	Deviation from baseline in most regions, especially in Latin America and Middle East
C-650 ppm CO ₂ -eq	Annex I	0% to -25%	-30% to -80%
	Non-Annex I	Baseline	Deviation from baseline in Latin America and Middle East, East Asia

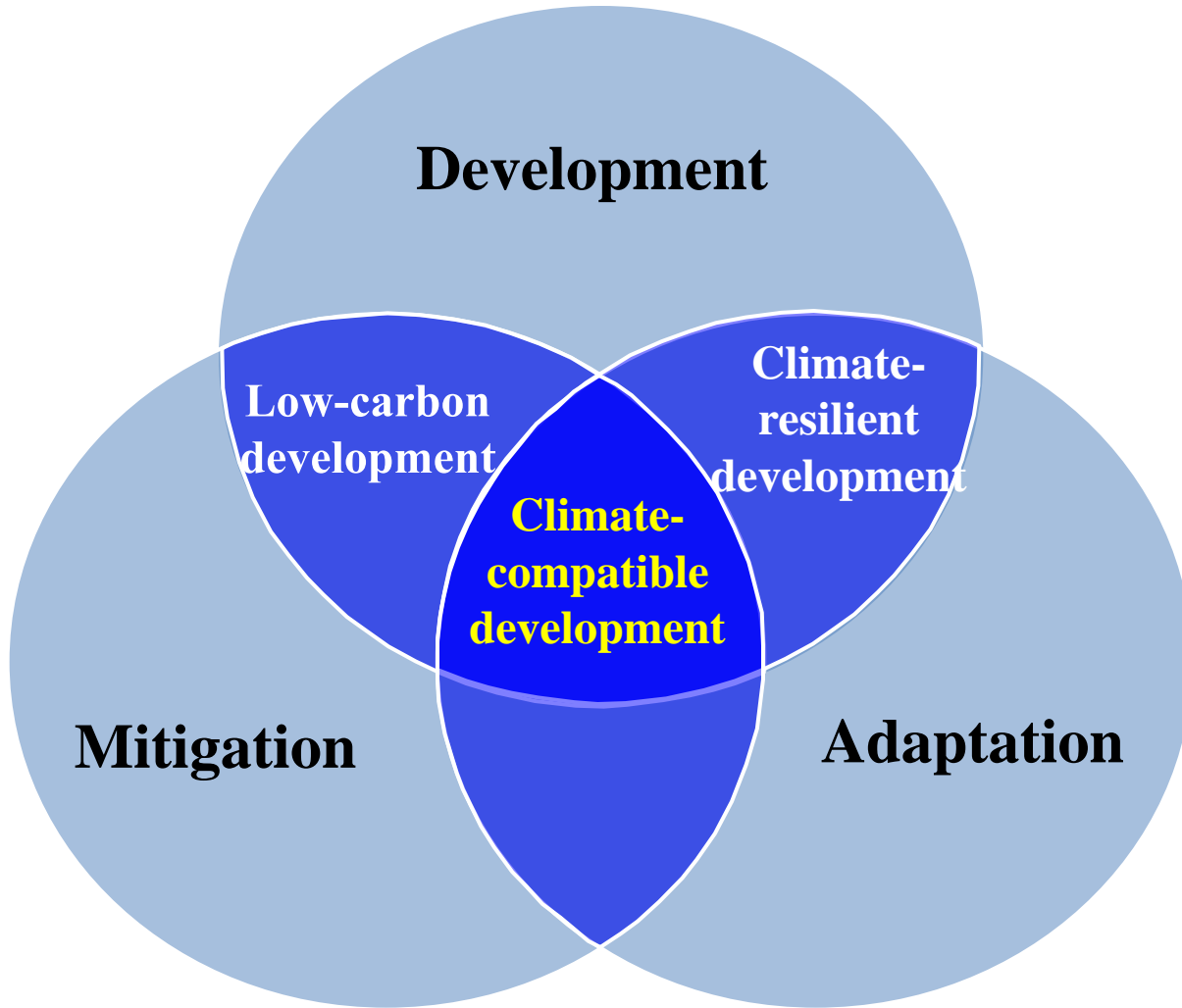
Issues



Development and climate change

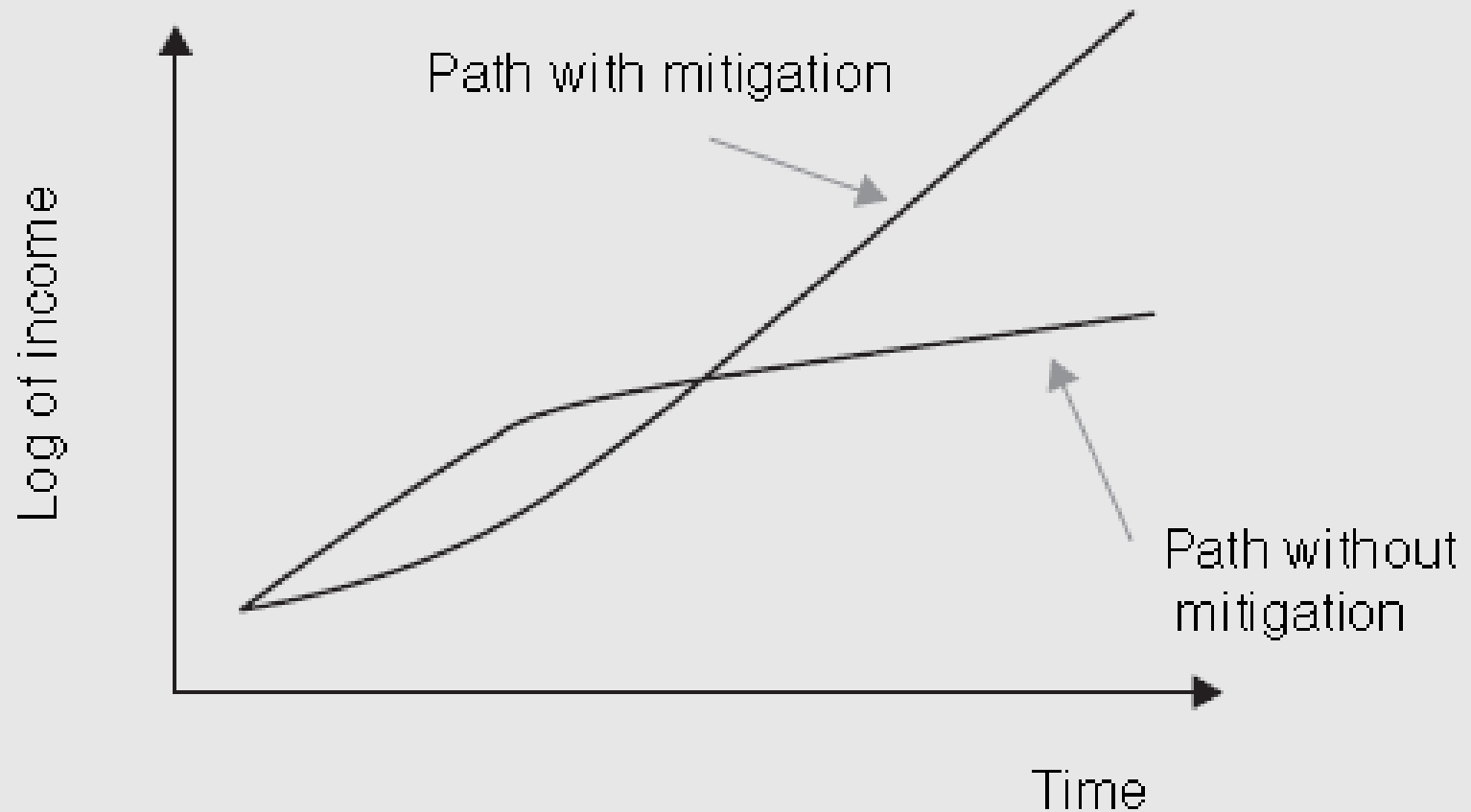


The response to climate change must be rooted in development



- Development is essential for eradicating poverty
- Climate change can undermine development
- Low carbon and climate resilient development (“climate compatible development”) as the answer

Low carbon development is economically attractive



Mainstreaming climate change in development policies

- Modernising industry to become competitive
- Improving energy security and reducing oil imports
- Providing clean and efficient transport to people
- Improving air quality to protect health
- Ensuring a strong and sustainable agriculture and forestry sector
- Greening macro-economic policy
- Providing electricity to the poor
- Developing coastal regions sustainably
- Building a good public health system
- Protect nature and biodiversity

How to change development paths?

- Develop capacity for change
- Start at the top
- Prepare long term low carbon, climate resilient plan
- Coordinate actions
- Climate proofing

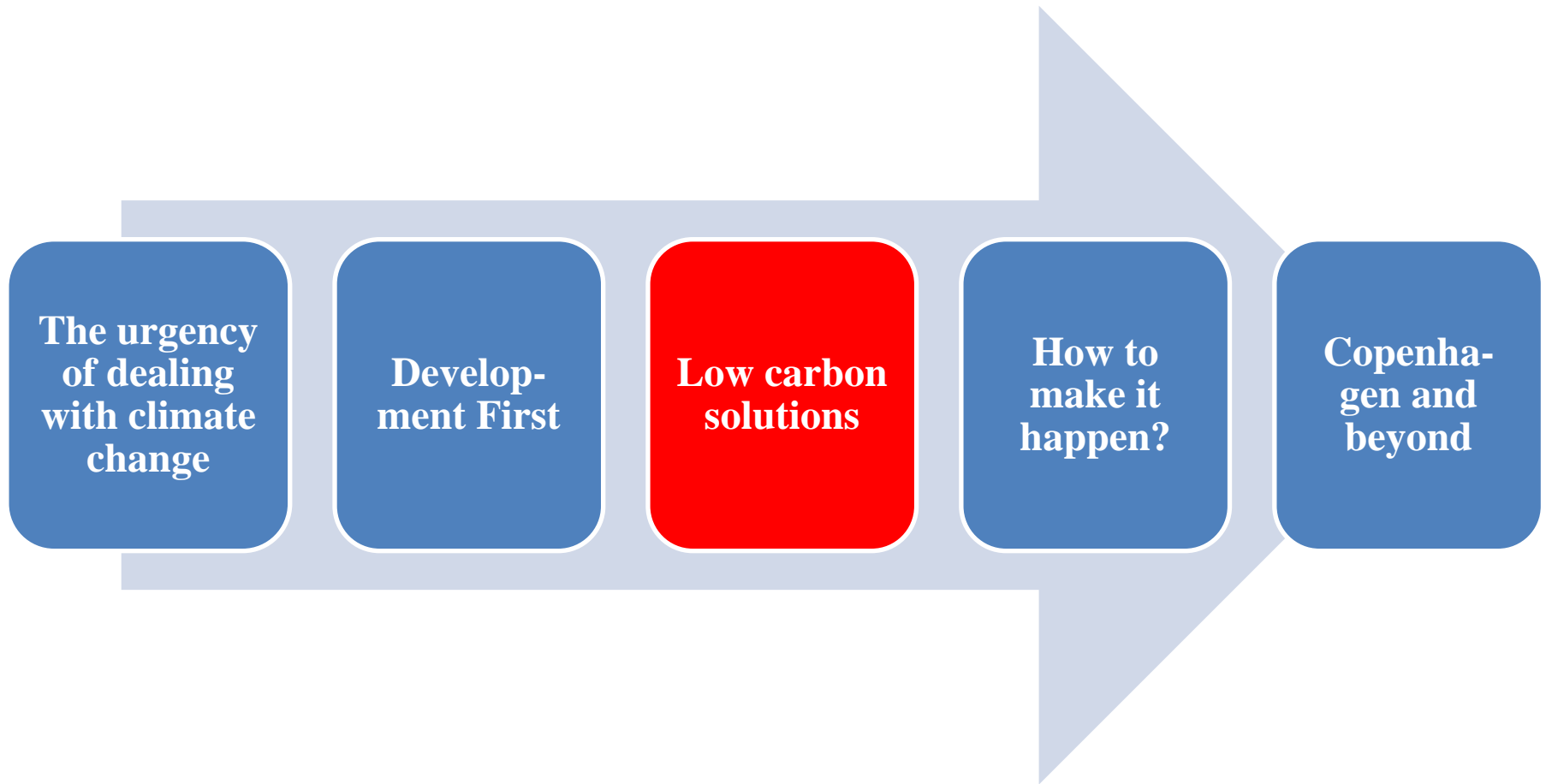
Low carbon development, a beginning (1)

- China:
 - Renewable Energy Law and the Tenth Five-Year Plan: reduce electricity sector emissions by 5 % below BAU in 2020
 - Medium and Long Term Energy Conservation Plan:
 - reduce cement sector emissions by 15 % below BAU levels in 2020
 - reduce iron and steel sector emissions by 9% below BAU levels in 2020
 - Fuel efficiency standards for passenger cars, SUVs, and multi-purpose vans: reduce transportation sector emissions by 5% below BAU levels in 2020
- Brazil:
 - Program for Incentive of Alternative Electric Energy Sources (PROINFA): reduce electricity sector emissions by 14 % below BAU levels in 2020
 - Brazil's ethanol program (flex fuel vehicles and cost competitive ethanol): reduce transportation emissions by 18 % below BAU levels in 2020
 - No net forest cover loss by 2015
 - GHG emissions 20% below 2005 by 2020

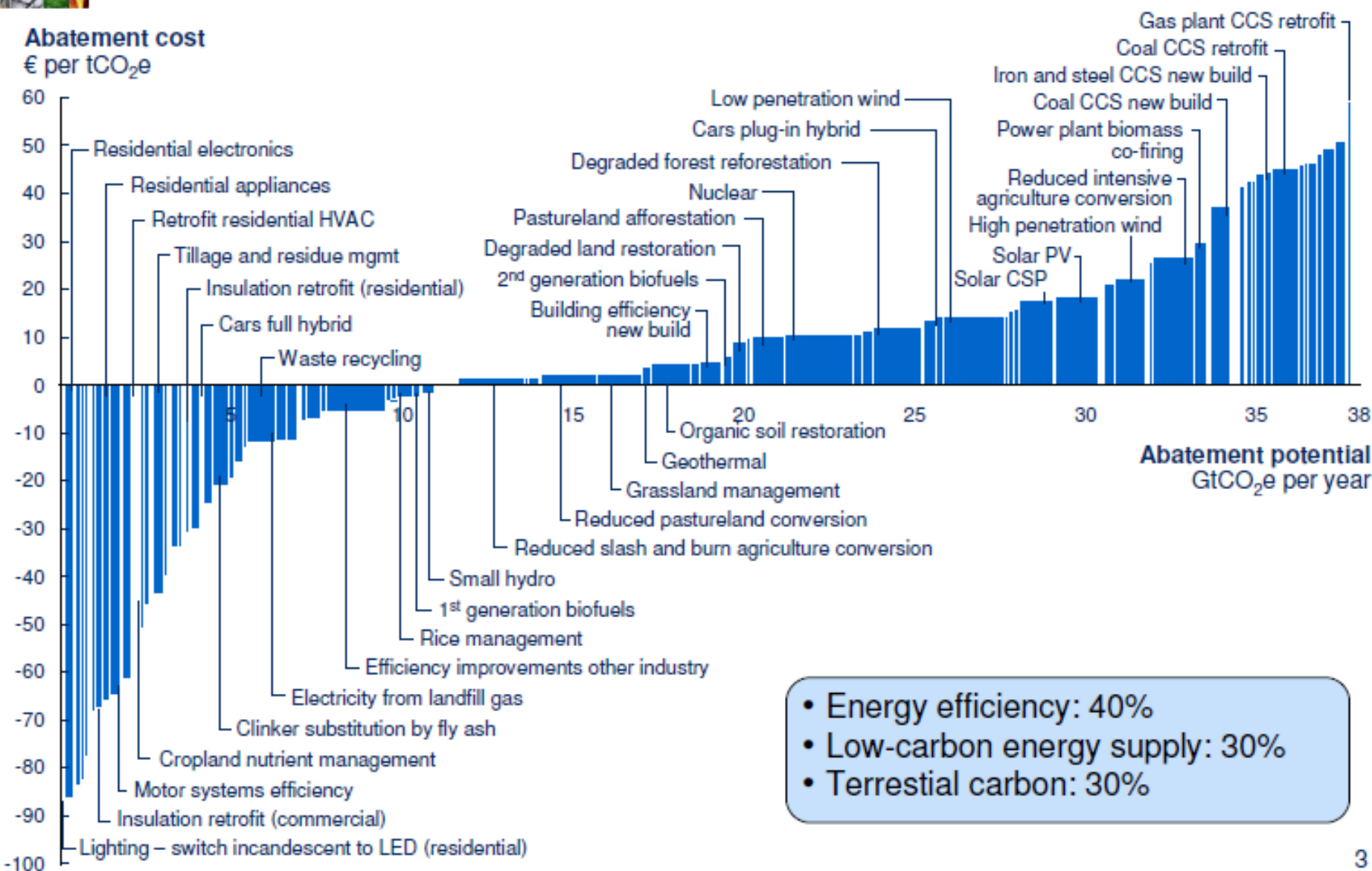
Low carbon development, a beginning (2)

- India:
 - Reduce transportation sector emissions by up to 15 % below BAU levels in 2020
 - 20 MW solar PV capacity by 2020
- Korea:
 - National Green Growth Plan
 - GHG emissions 4% below 2005 by 2020
- South Africa:
 - National long term climate change strategy
 - GHG emissions 34% below BAU by 2020 and peaking between 2020-2025 (conditional)
- Indonesia :
 - GHG emission 26% below BAU by 2020
 - 0.5Mha/yr tree planting; 0.3 Mha/yr forest rehabilitation and stop illegal deforestation
- EU:
 - GHG emissions 80-95% below 1990 by 2050
- US:
 - GHG emissions 80% below 1990 by 2050

Issues

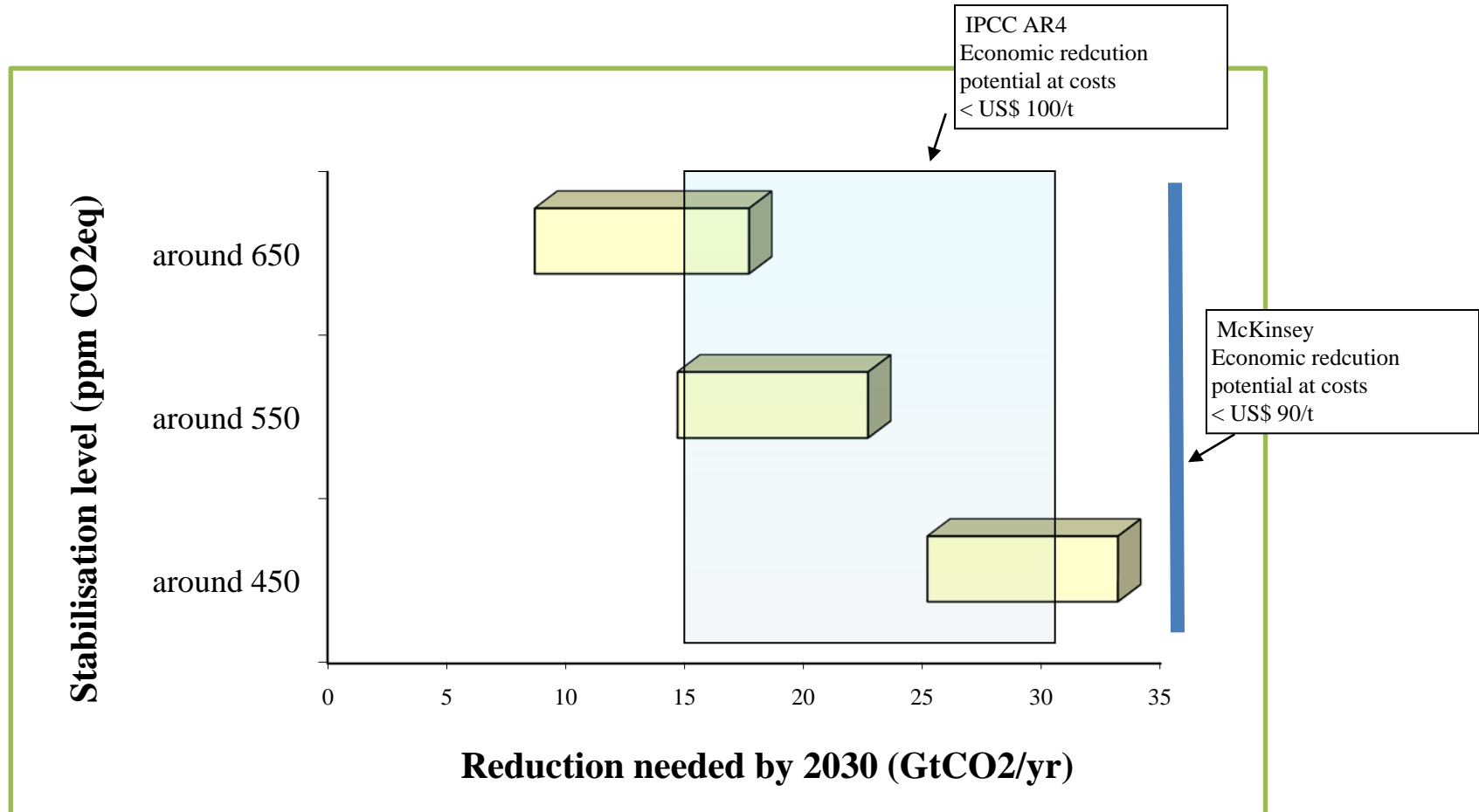


Global GHG abatement cost curve beyond business-as-usual – 2030



Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €60/tCO₂e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.

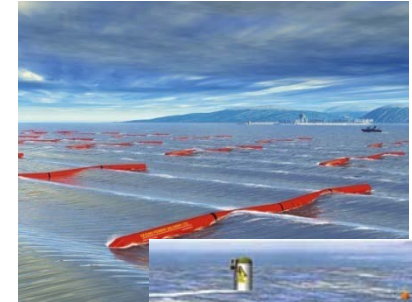
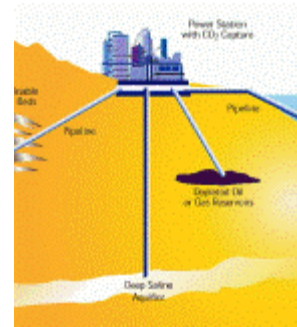
The mitigation potential to stay on track to 450 ppm CO₂ eq stabilisation is there



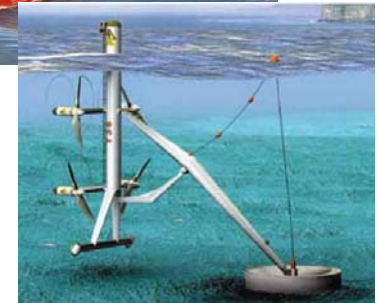
Commercial energy supply mitigation technologies

NOW

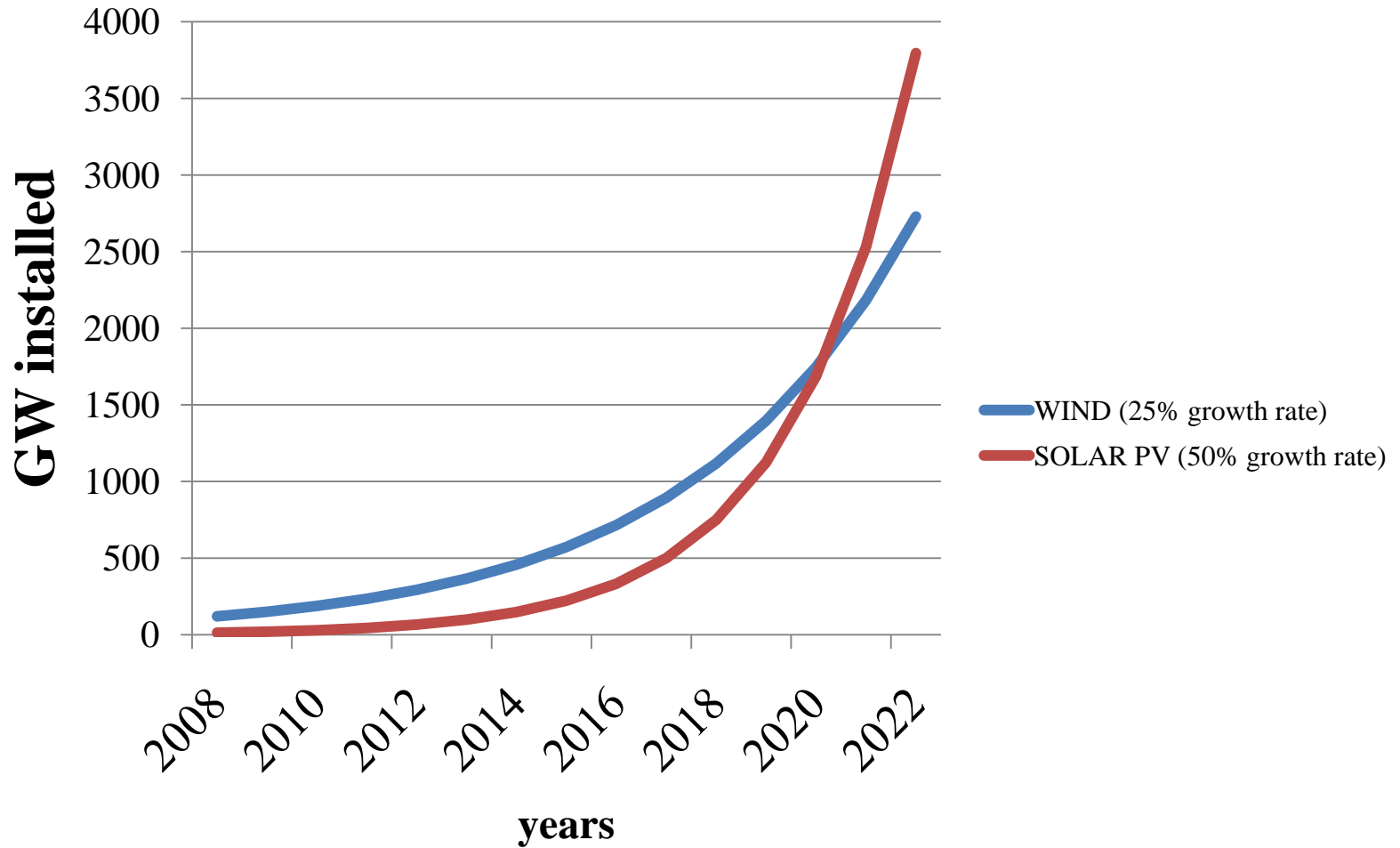
2030



Courtesy of The National Renewable Energy Laboratory (NREL)

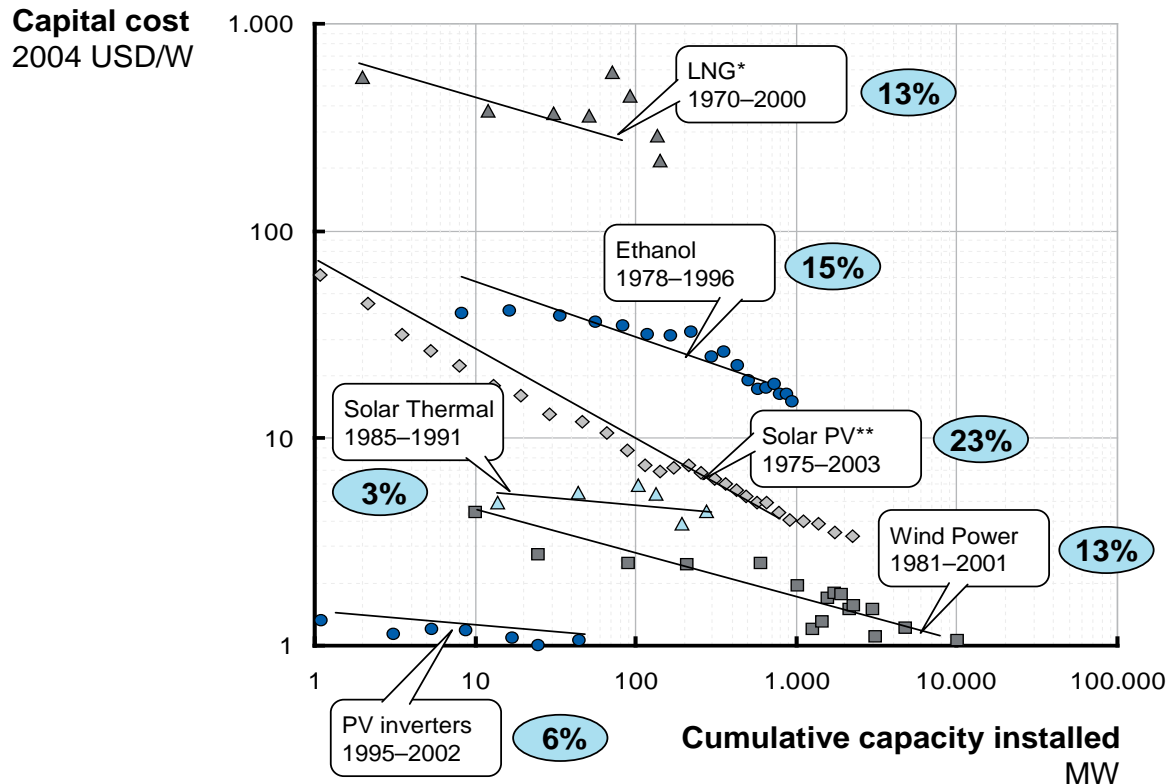


What exponential growth can do



Technological learning

Learning rate experience from renewables
and LNG as capacity is installed

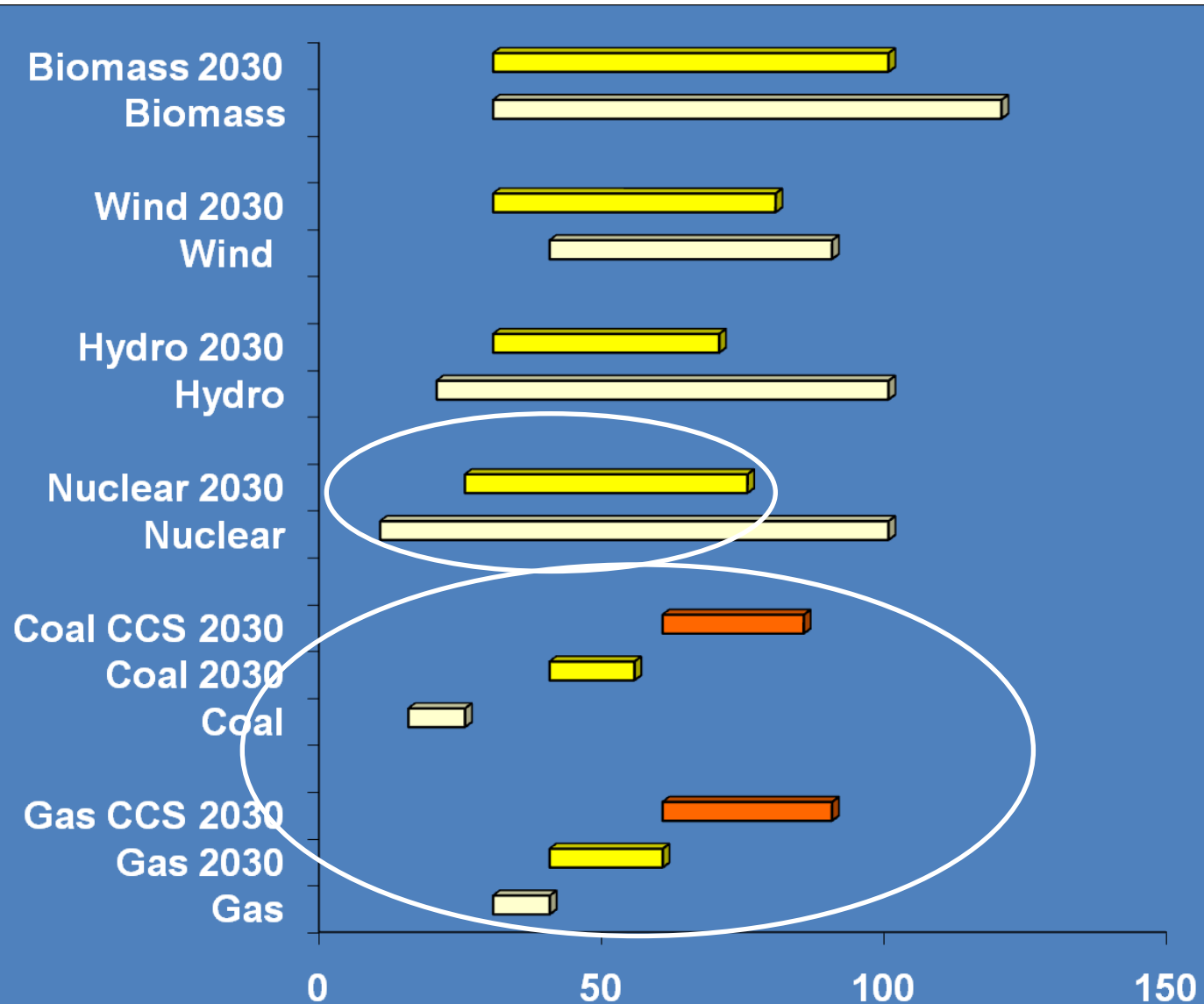


* LNG capital cost measured in USD/t and capacity measured in bcm

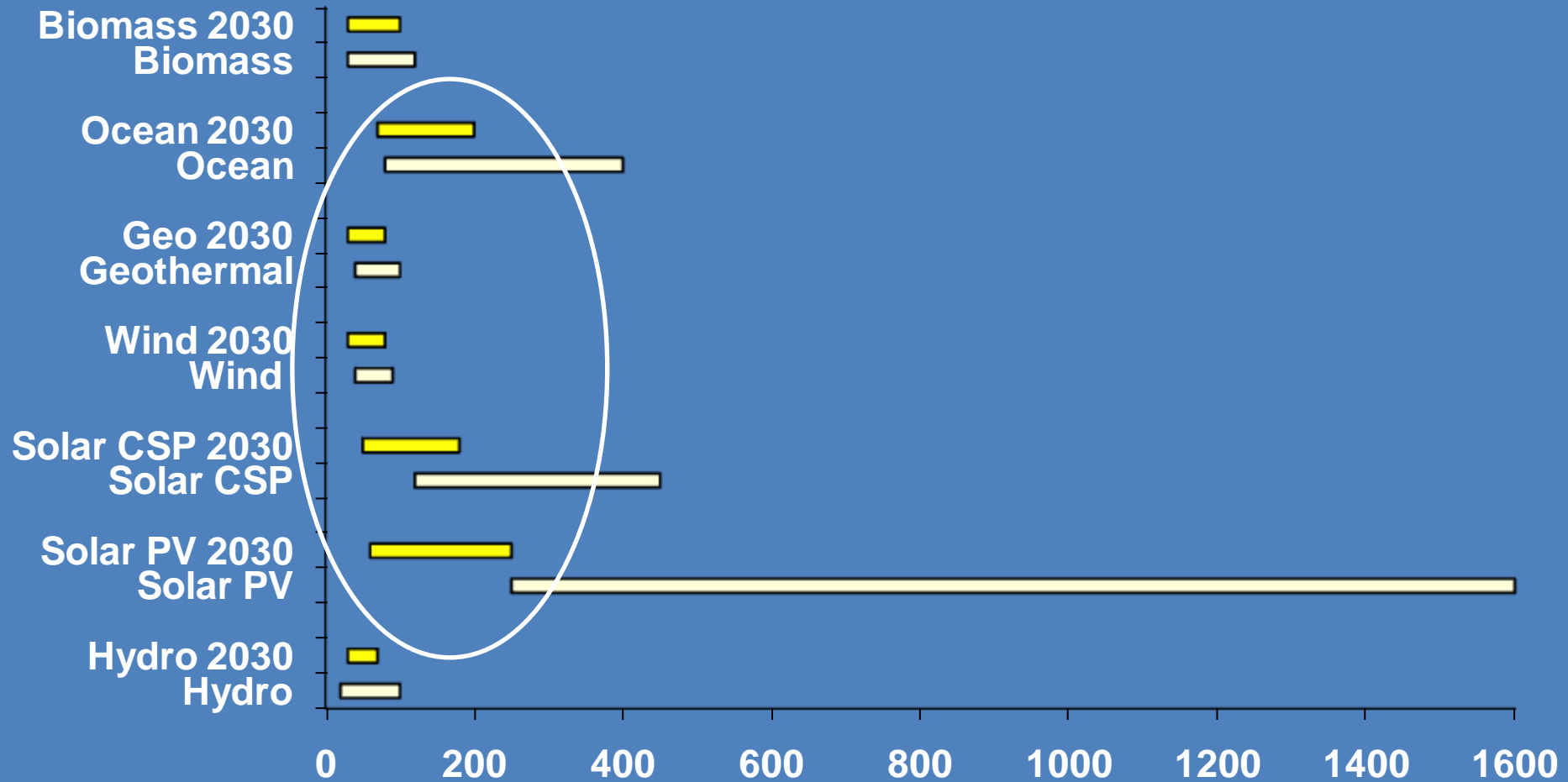
** Other sources indicate learning rates as low as 18% for solar PV

Source: Worldwatch Institute; IEA; BTM consult; ABS; NREL; IIIEE; ABI; Drewry 2007; UC Berkeley ERC Team analysis

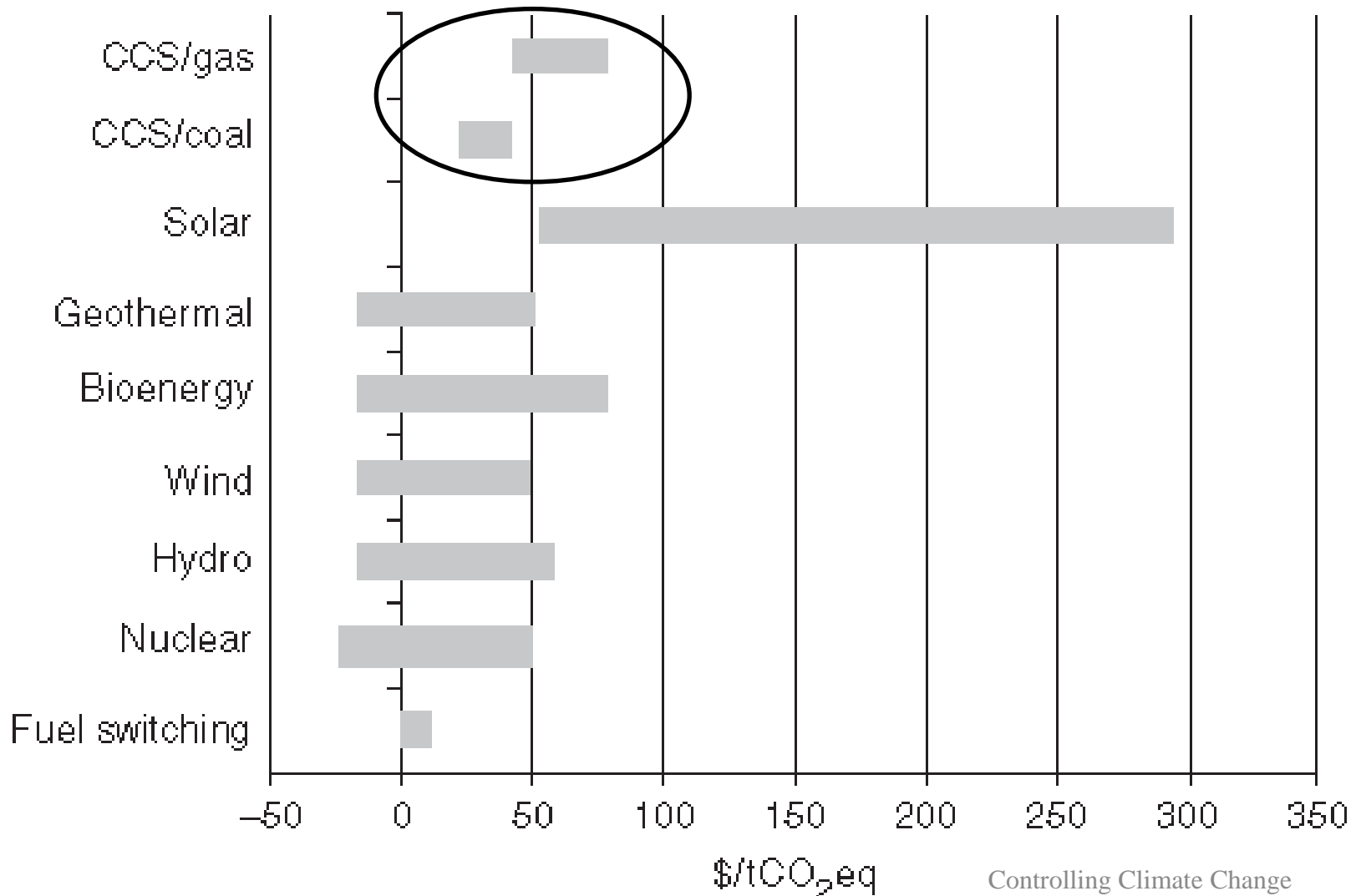
Global electricity costs 2000-2030 (\$/MWh)



Global electricity costs 2000-2030 (\$/MWh)



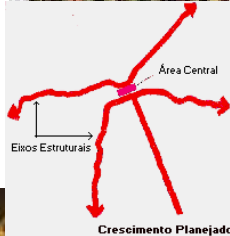
Cost per ton CO₂ eq avoided, relative to coal fired power plant



Commercial transport mitigation technologies

NOW

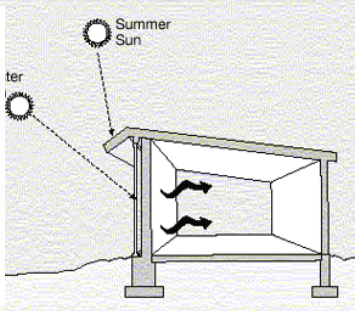
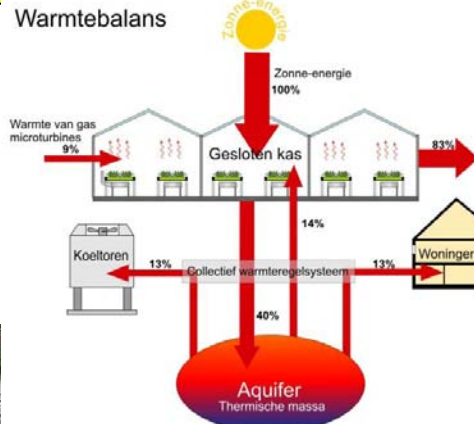
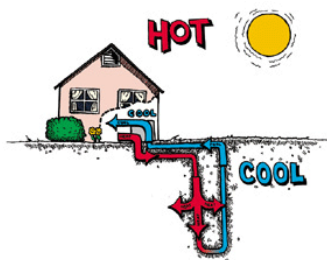
2030



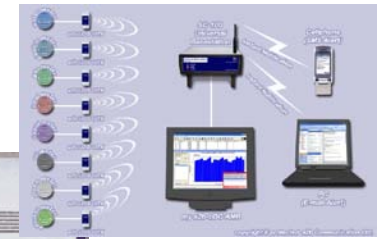
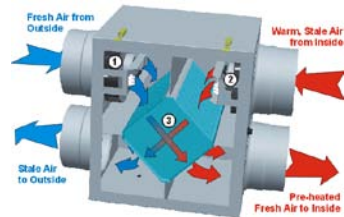
Commercial mitigation technologies in the building sector

NOW

2030



Energy	Washing machine
Manufacturer Model	
More efficient	
A	
B	
C	
D	
E	
F	
G	
Less efficient	
Energy consumption kWh/cycle	1.55
Water consumption litres/cycle	45
Washing performance	A++
Spin drying performance	A++
Capacity (kg)	6.5
Water consumption	6.5
Noise	42
Washing (dB(A) m 1 pW)	7.4
Spin drying (dB(A) m 1 pW)	7.4
Subprogramme number	
Subprogramme	
Energy label	
Energy label	



Controlling Climate Change

Changes in lifestyle and behaviour patterns can contribute to climate change mitigation

- Changes in occupant behaviour, cultural patterns and consumer choice in buildings.
- Dietary choices
- Reduction of car usage and efficient driving style, in relation to urban planning and availability of public transport
- “Rebound effect”?

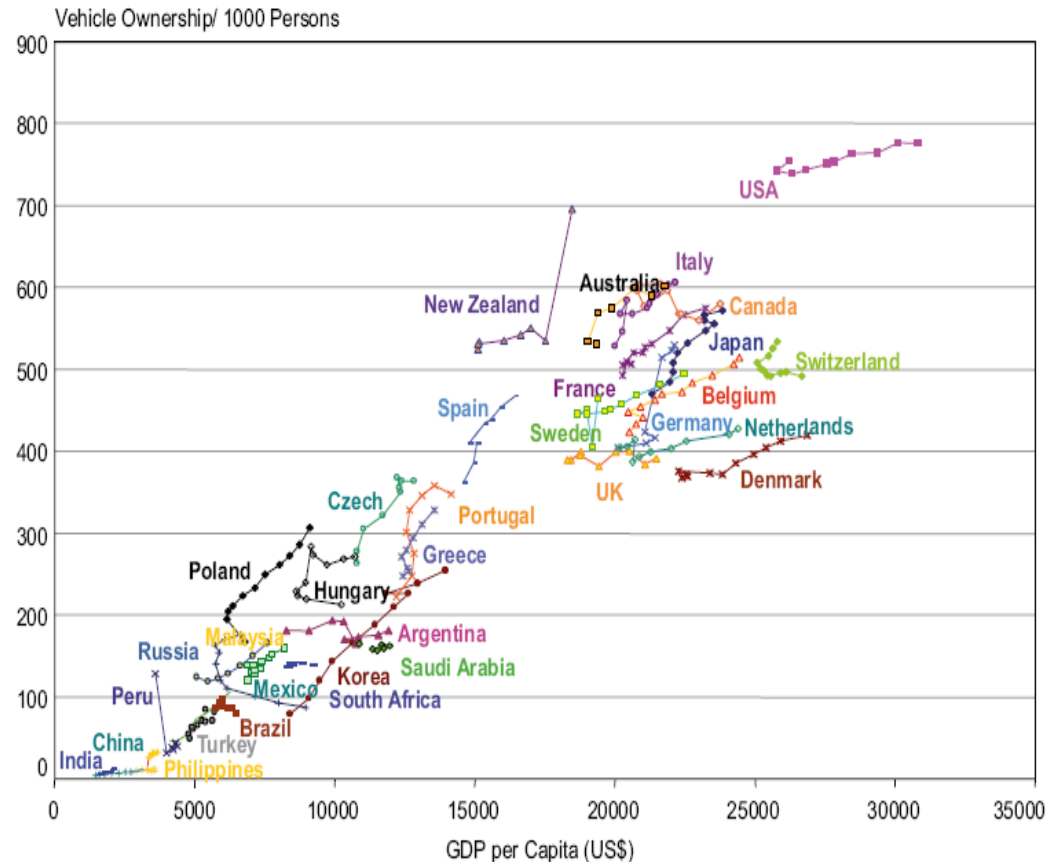
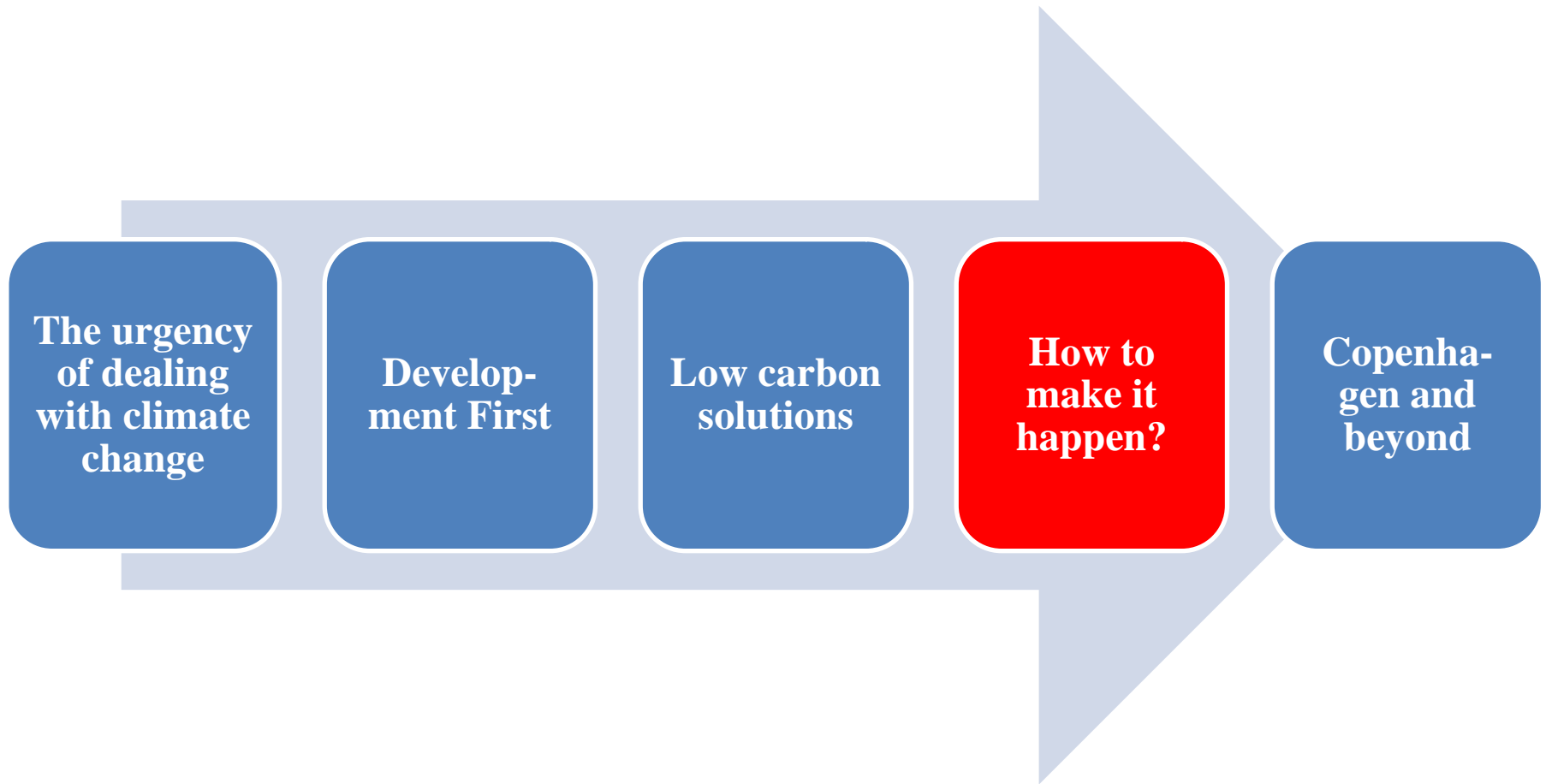


Figure TS.14: Vehicle ownership and income per capita as a time line per country [Figure 5.2].

Note: data are for 1900–2002, but the years plotted vary by country, depending on data availability.

Issues



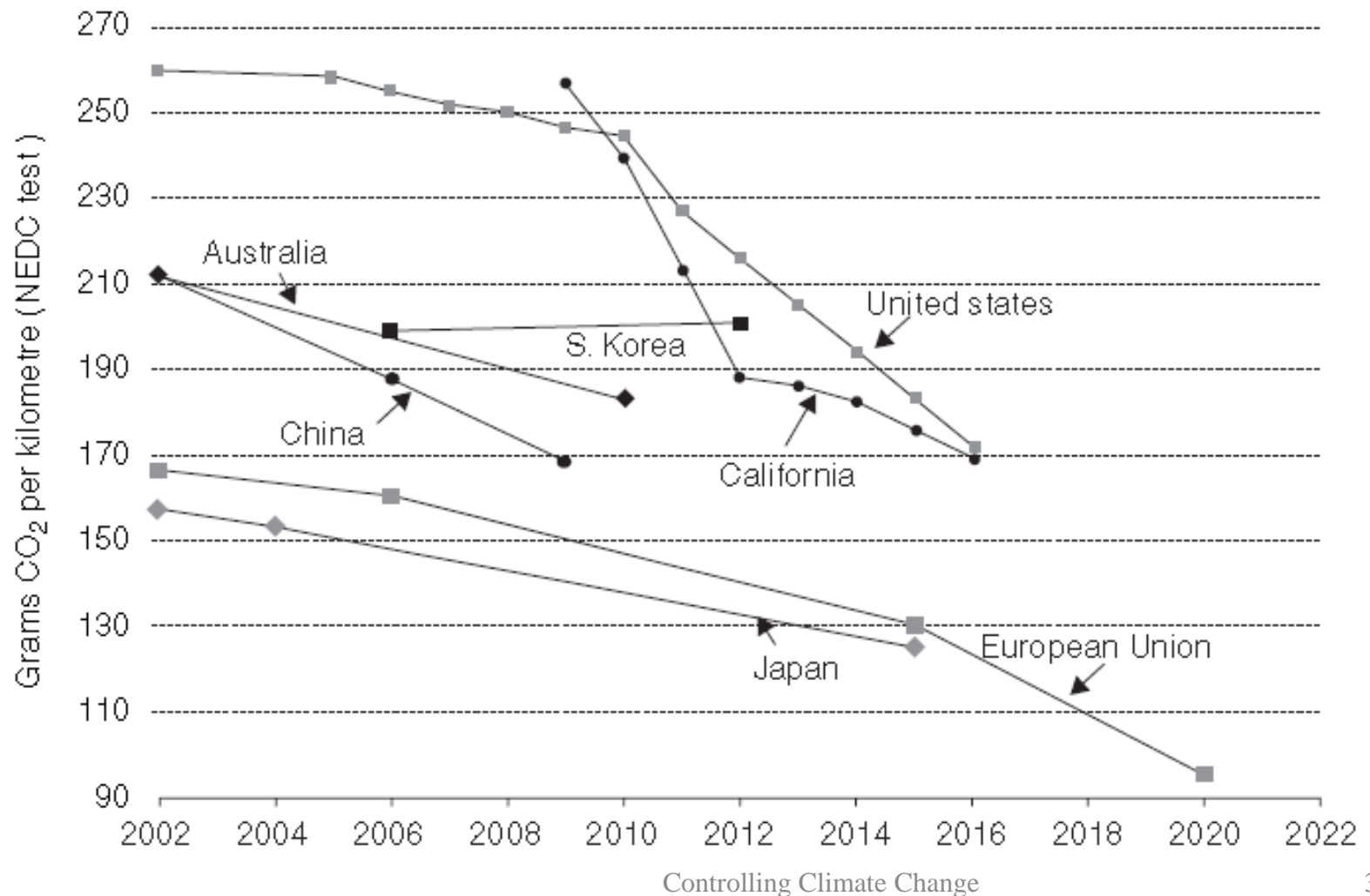
We do have experience about effective policies

- Energy supply:
 - Reduction of fossil fuel subsidies
 - Taxes/ carbon charges
 - Cap and trade systems
 - Feed-in tariffs
 - Renewable energy obligations
 - Producer subsidies

We do have experience about effective policies

- Transportation:
 - Fuel economy/ CO₂ standards
 - Biofuel blending obligations
 - Taxes/ charges/ tax credits on vehicle purchase, registration, road use, parking
 - Investing in public and non-motorised facilities
 - Land-use and infrastructure planning

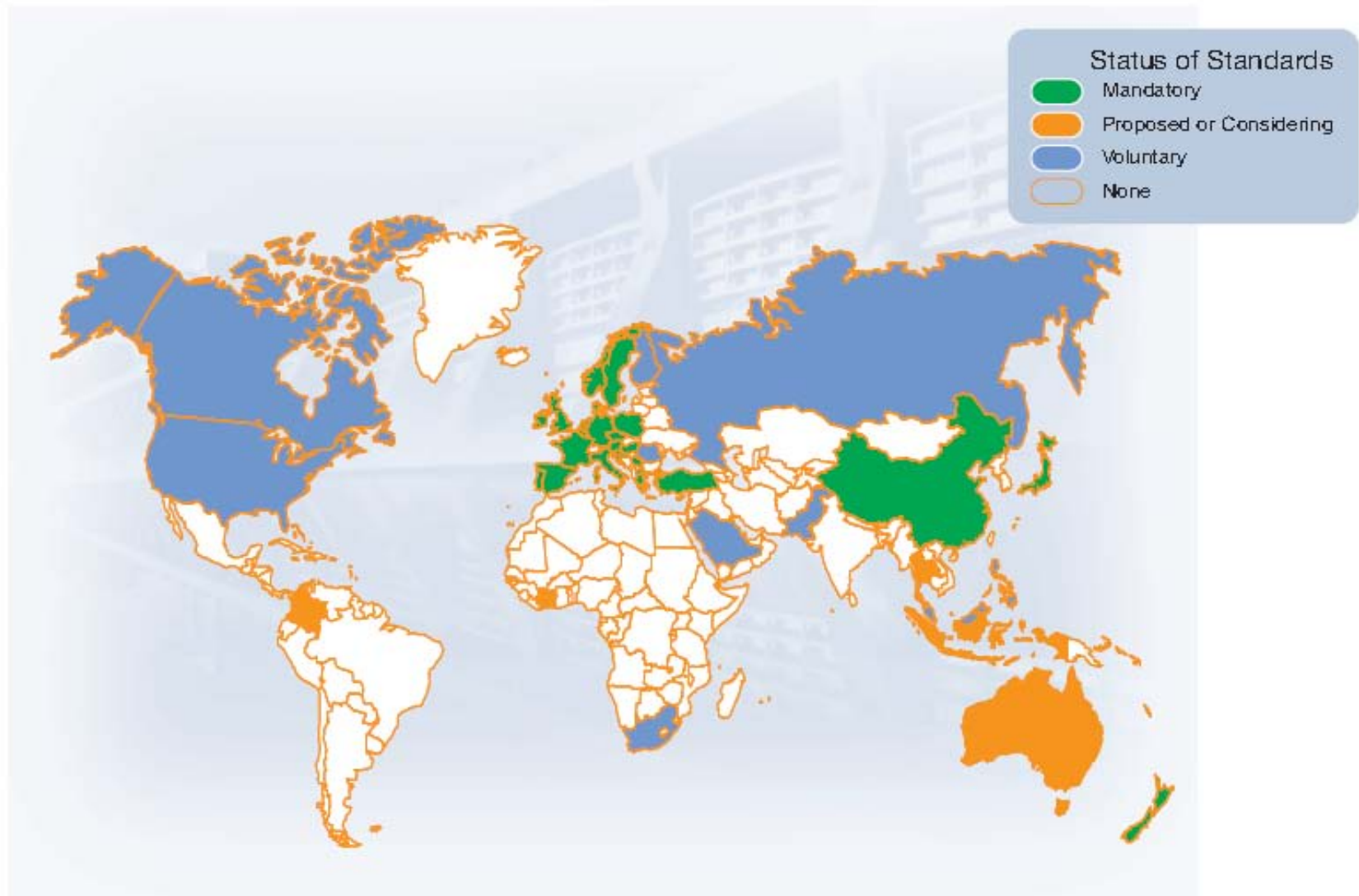
Fuel efficiency standards are driving innovation



We do have experience about effective policies

- Buildings:
 - Building codes
 - Demand side management
 - Appliance standards
 - Public sector procurement
 - Energy Service Companies

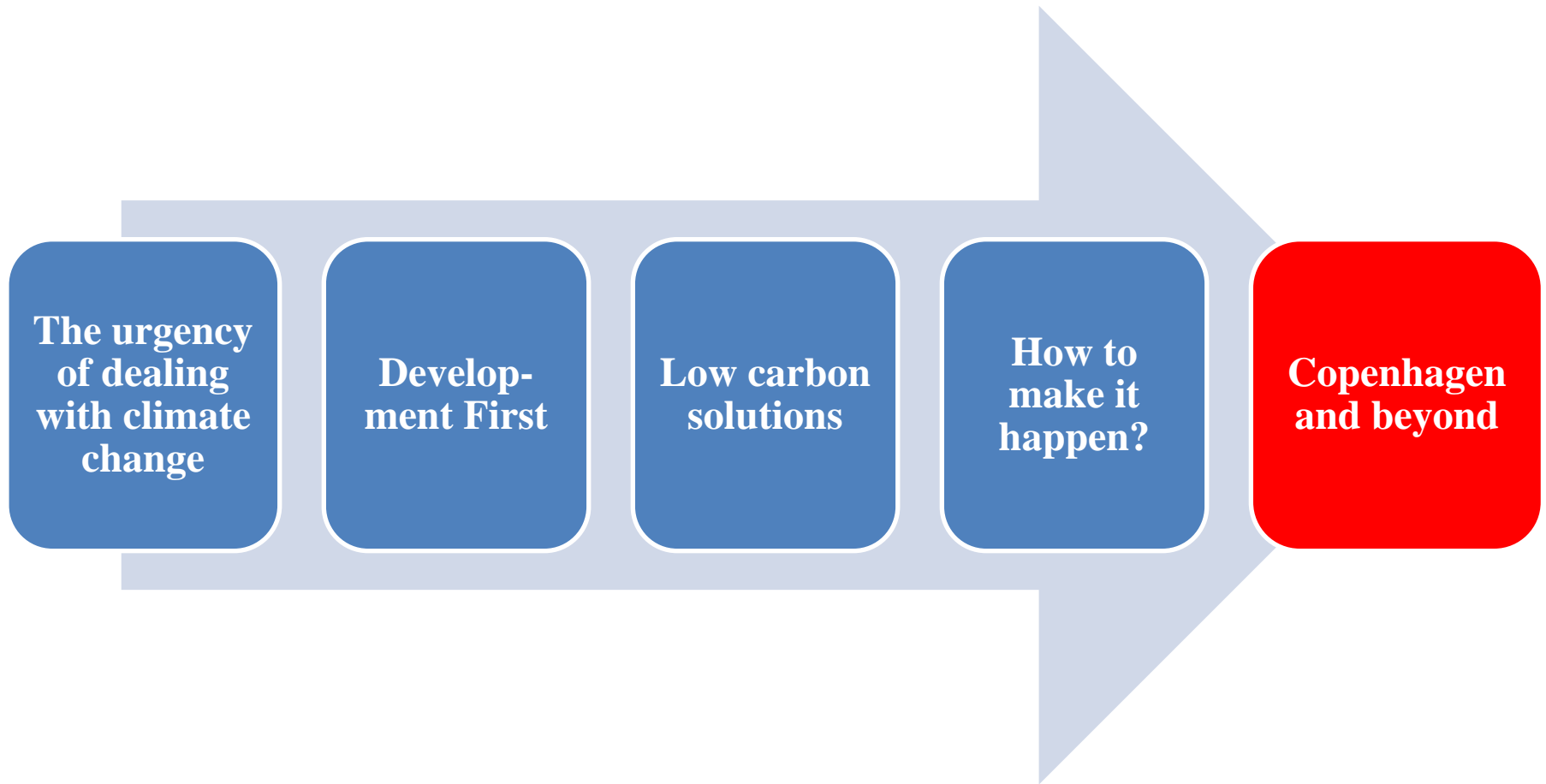
Building codes



Climate policy alone will not solve the climate change problem

- *Macro-economic policy*: taxes, subsidies, other fiscal policies, structural adjustment
- *Government procurement policy*: low carbon / sustainable product preference
- *Trade policy*: “embodied carbon”, removing barriers for low-carbon products, domestic energy sources
- *Energy security policy* : efficient energy use, domestic energy sources (low-high carbon)
- *Air quality policy*: clean fuel
- *Bank lending policies*: lending for efficiency/ renewables, avoid lock-in into old technologies
- *Insurance policy*: Differentiated premiums, liability insurance exclusion, improved conditions for green products

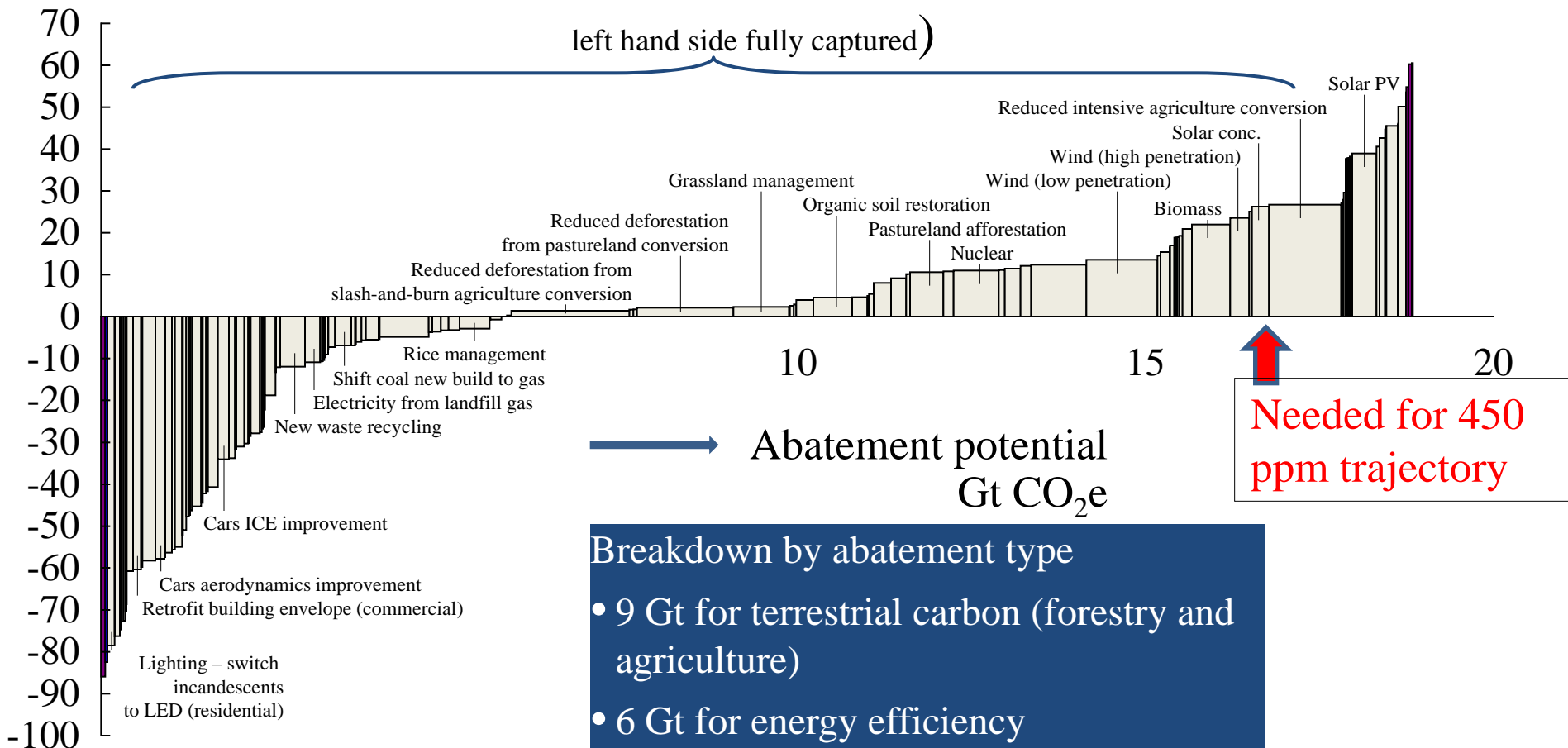
Issues



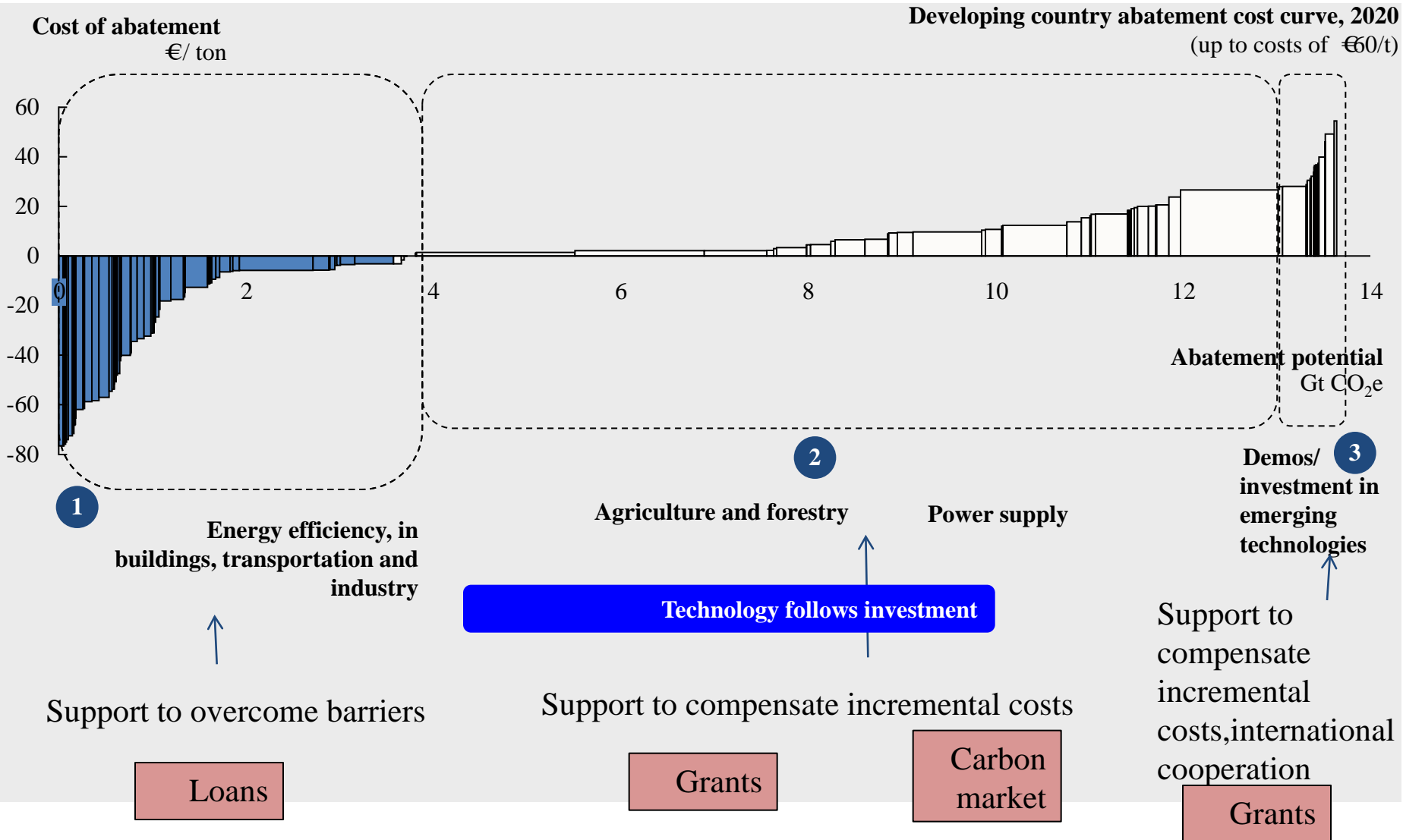
Global abatement cost curve 2020

(up to costs of €60/t, excluding transaction costs, 4% discount rate)

Average cost of opportunities up to 17 Gt = €0/t (if benefits of left hand side fully captured)



How financing developing country mitigations could have worked

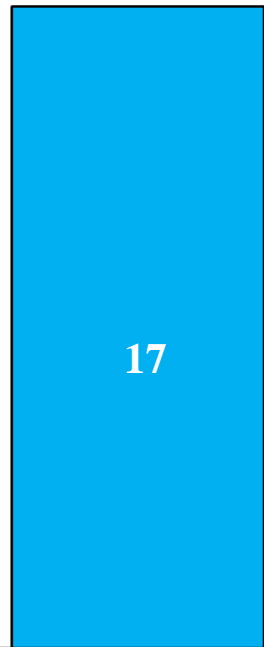


Source: McKinsey Global GHG Abatement Cost Curve v2.0 and project Catalyst

How an equitable distribution of delivering 17 Gt CO₂eq reduction by 2020 could have worked

**Required
abatement
in 2020, Gt**

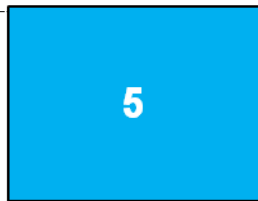
17



Required
abatement
for 450ppm
pathway

**Required abatement for developed country target
of 25%**

5



Developed
countries'
abatement
<€60/t

**Covering full
incremental costs**

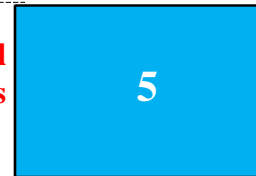
**Flexible
mechanism
required
to meet 25%
target**

4



Support for incremental cost,
e.g., concessional loans,
grants, payments

5



Developing
countries'
abatement (NPV
negative)

**Potential abatement in
developing countries**

Support for capacity building
and loans for capital
investment where required

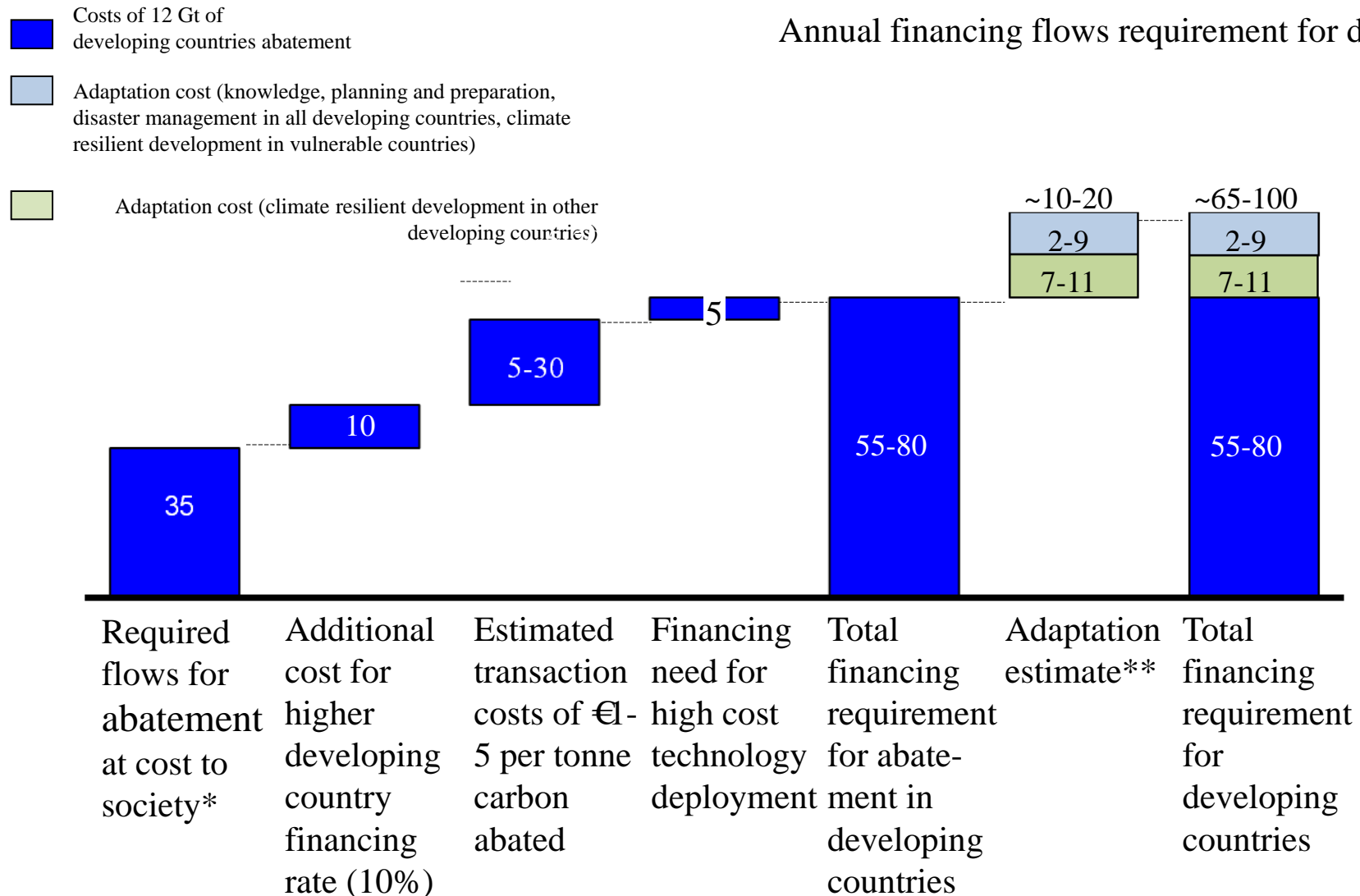
4



Developing
country
abatement (NPV
positive)

40

Developing countries would have needed up to €65-100 billion/yr in incremental cost financing for 2010-20



Copenhagen Accord(1/2)

In	But	Consequence
Recognising 2 degree limit	No reduction commitments to get there; targets/actions likely to get in far below top end	We are on track to 3-4 degrees; chances of staying below 2 degrees virtually zero
Review in 2015 with option to tighten global limit	No strengthening of 2020 reduction commitments	This is lip service to vulnerable countries; has no practical impact; does not increase chance to stay below 2 degrees
Annex I countries to list their 2020 targets and non-Annex-I PART of their actions by Feb 1, 2010	Terms “developed” and “developing”(as in Bali Action Plan) disappeared; accounting rules NOT uniform; nothing about surplus AAU; no benchmark on how much they do	Including “new developed countries” impossible; big loopholes on value of targets; and targets not coming in at high end (if at all)
Stressing importance of adaptation and provide about half of \$30 billion in support 2010-2012	Money likely to be at least partly relabelled ODA	Vulnerable countries are getting financial support, while climate change impacts are getting much worse

Copenhagen Accord (2/2)

In	But	Consequence
“we support the goal to mobilise \$100 billion by 2020 “; public and private money	No commitment to deliver this money; no mechanisms to generate funding; no governance structure to manage effective disbursement	Unclear if there ever will be significant money
“we agree on the need to establish a REDD + mechanism”	Nothing established and no process to establish it; no rules	Fast start money will partly flow to countries to avoid deforestation; rest unclear
Copenhagen Climate Fund established	Nothing how to fill the fund and nothing on governance (only Panel to study resources)	Unclear if fund will ever be operational
Develop market approaches	Nothing about reforming carbon market	Vacuum on carbon market
“provide incentives to developing countries to continue on a low emissions path”	nothing about Low Carbon Growth Plans	No impact on producing low carbon development plans

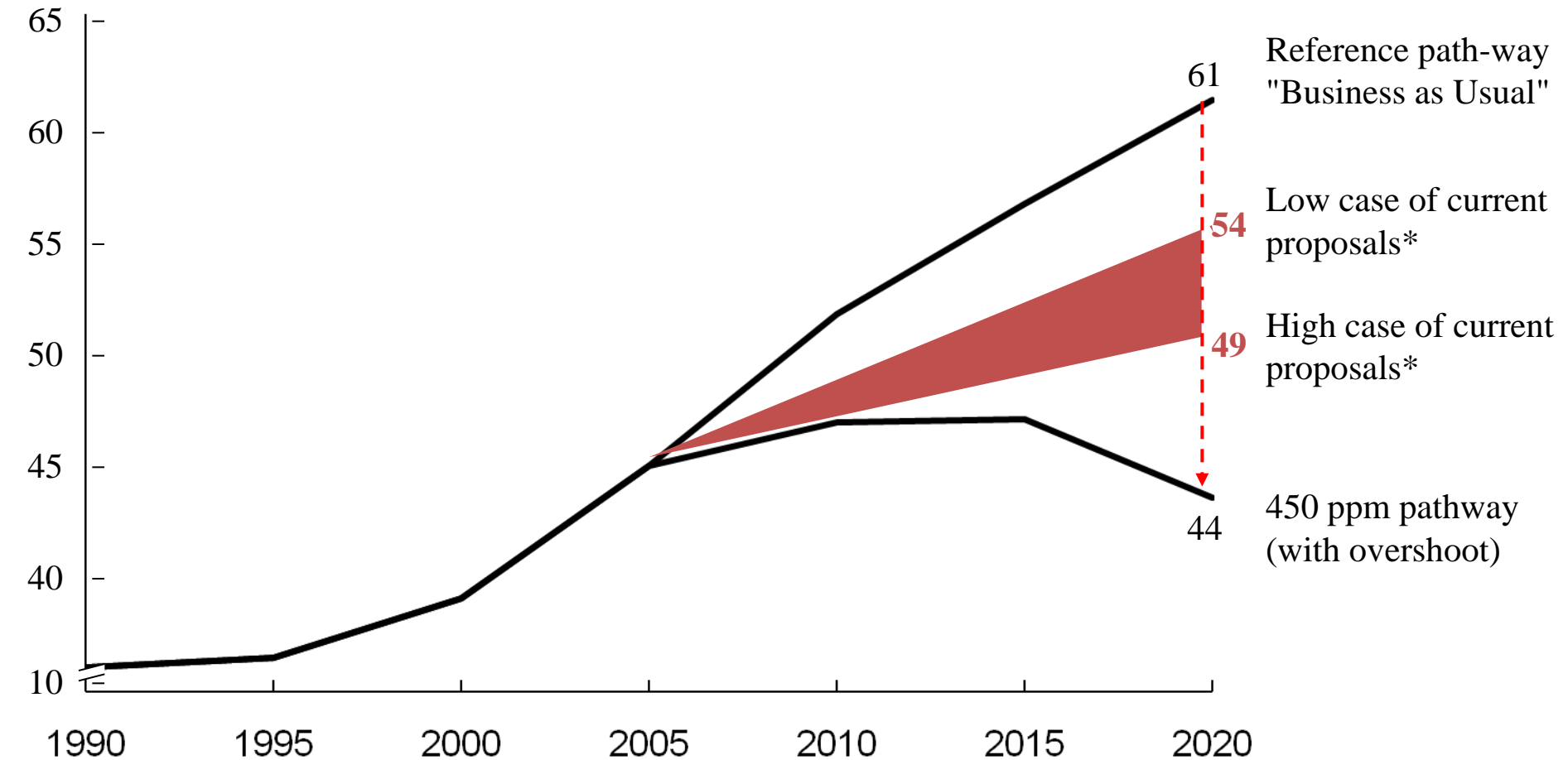
CopenhagenDecisions

In	But	Consequence
Decision to continue AWG-LCA and request to deliver outcome by COP16	No statement on legally binding outcome; no process decisions; vague paragraph on Mexico mandate	Totally unclear if there will be serious negotiating process (also in light of acrimonious debates in CPH)
Decision to continue AWG-KP and request to deliver outcome at COP16	Demands of EU, Japan, Russia, Australia to have legally binding outcome (=Protocol) from LCA ignored; vague paragraph on Mexico mandate	Kyoto Annex B countries may never agree with KP amendment or never ratify

Pre-Copenhagen proposals get us within 5 Gt of a 450 ppm pathway if nations deliver upper range of proposals

Global GHG emissions

Gt CO₂e per year

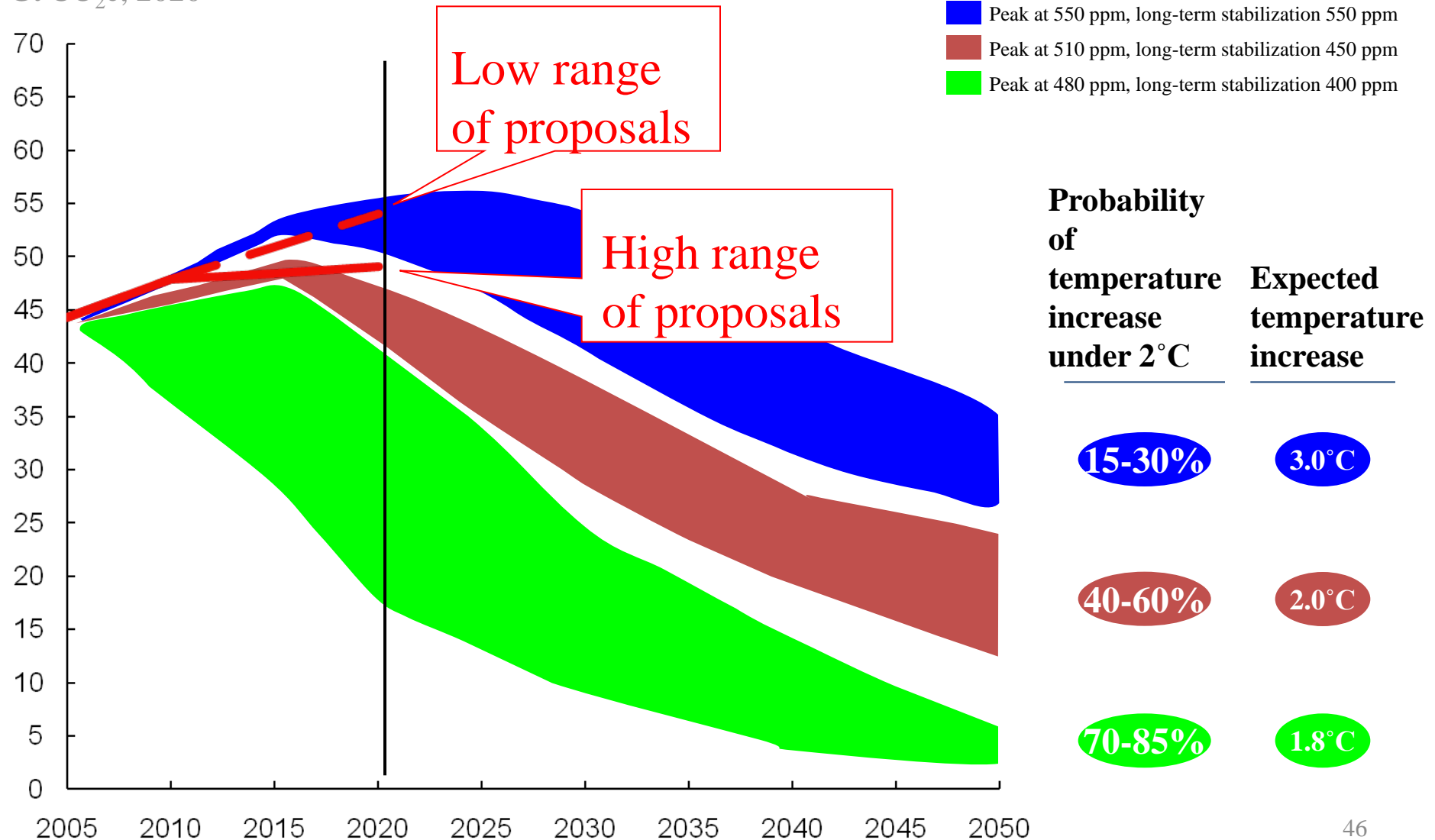


* E.g., 20% vs. 30% below 1990 emissions in the EU – taking into account the effect of the recession and lower expected emissions from deforestation and peat

Source: McKinsey Global GHG Abatement Cost Curve v2.0; Houghton; IEA; US EPA; den Elzen, van Vuuren; Project Catalyst analysis

But are putting us on a track to 3 degrees or more.....

Global GHG emissions and pathways for GHG stability
Gt CO₂e, 2020



What are the reasons for the Copenhagen failure?

Power has shifted

- US, China (plus India, Brazil, South Africa) now the real powers
- Their current interest is not to have binding deep GHG reductions
- China client states using process to counter developed country actions

UNFCCC process ineffective

- G77 interpretation of Bali Action Plan prevents effective outcome (blocks one new Protocol)
- Top down role of AWG Chairs (and COP presidency) blocked over entire 2 year process; chairs did not force a clash earlier
- Vulnerable countries support China and Saudi Arabia in exchange for money
- Blocked majority voting (by OPEC) paralyses process

US domestic politics

- Hypocrisy on binding others and demanding total freedom for US
- Fixation on China and necessity to have trade sanctions in domestic climate law forces China into defensive attitude (no commitments, no verification)

EU lacked vision

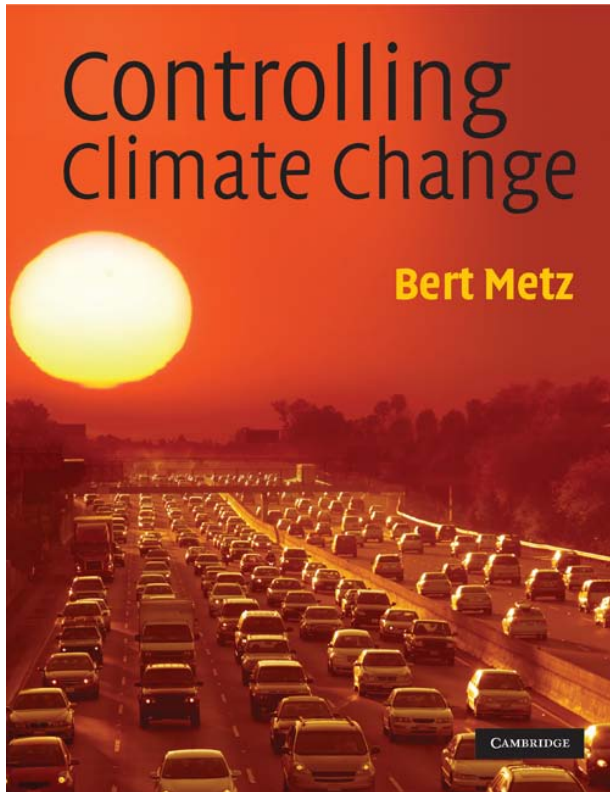
- Zigzagging on legal outcome
- Strategy too dependent on others (only -30% if others comparable, keeping long-term finance till concessions of G77)
- Not prepared for power play

What are possible implications?

- Unclear how UNFCCC process can deliver ambitious legally binding treaty by COP16
- MEF/G20 not effective if delinked from UNFCCC
- Focus may shift to like-minded country actions (REDD, Fast-Start Finance for adaptation and mitigation, policy coordination)
- National actions become more important, and trade measures more likely (self interest)
- Moving towards “low carbon prosperity” paradigm to unlock the situation

Thank you

bert.metz@europeanclimate.org



<http://www.cup.cam.ac.uk/catalogue/catalogue.asp?isbn=9780521747844>