



Climate Change:

Facts and politics; science
and art

A curtain-raiser

Centre for Science and Environment

Inconvenient truth



- Climate change is real
- The world needs to cut emissions drastically and urgently
- South Asia is most vulnerable
- Poorest – not responsible for climate change – are worst impacted
- We will lose development dividend

Climate change is **real**



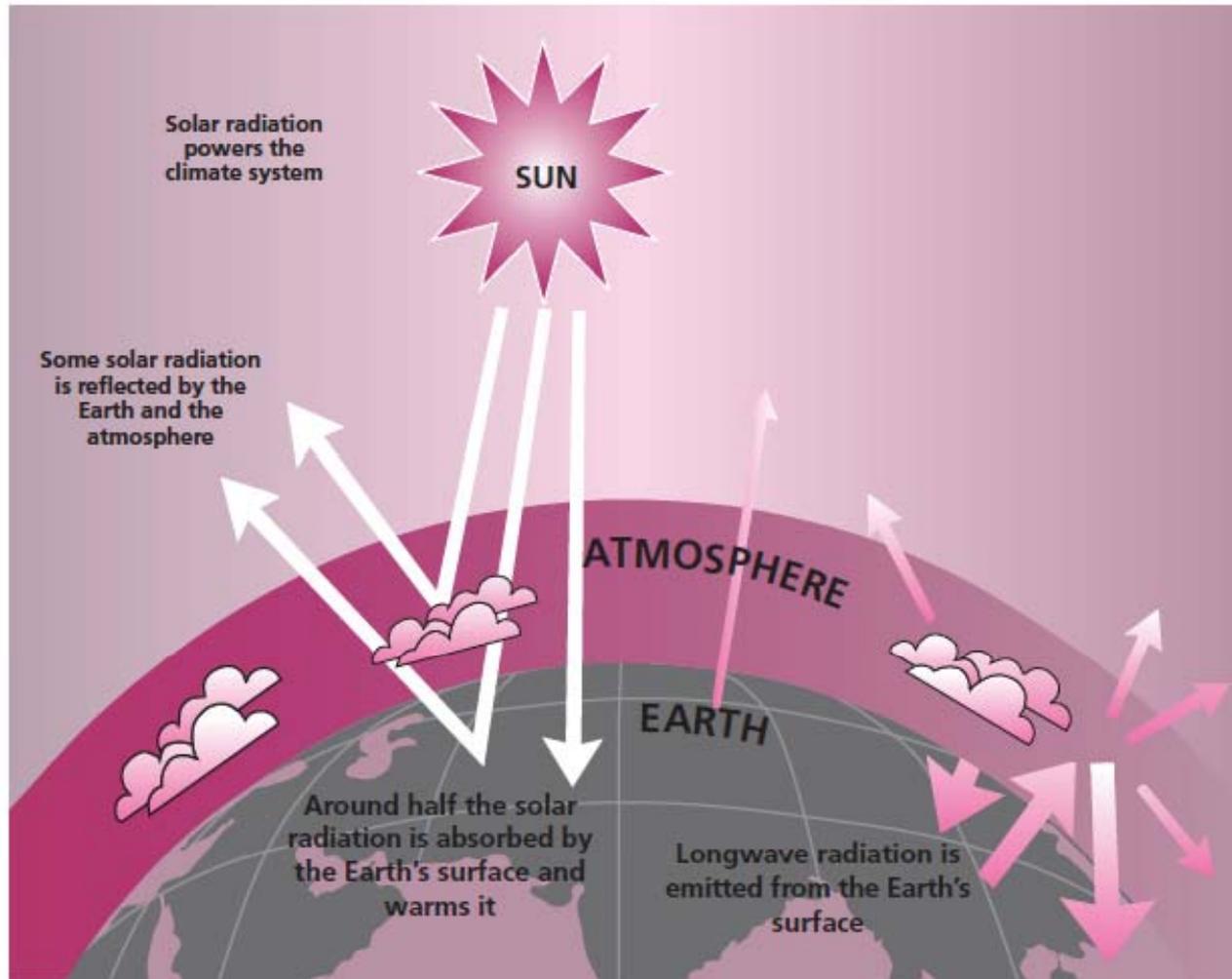
- Beginning to see **extreme rainfall events**: more rain, less rainy days, cloud bursts, unseasonal, variable extreme rain (Uttarakhand disaster)
- Beginning to see *some* trend in **mean temperatures**, impacting crops
- Beginning to see some **intensification of tropical cyclones/sea surges** because of warmer temperatures

All in all: bad news ahead

Basics: The Earth has a double blanket: heat is trapped



Figure 1.1: The greenhouse effect



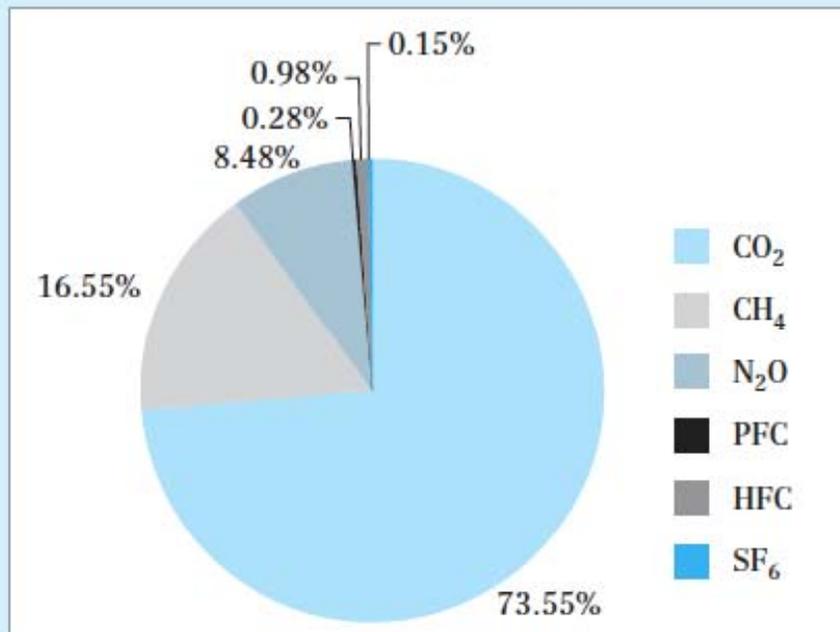
Source: Le Treut *et al* 2007, 'Historical overview of climate change', *Climate Change 2007: The Physical Science Basis*, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, p 115

Gases: annually released and annually absorbed



Forest, oceans, land: absorb emissions but now we emit far beyond what they can 'clean'

Graph 2.1: Global GHG emissions by gas in 2005 (inclusive of land use changes and forestry and international bunkers) (all values in million tonne of CO₂ equivalent)



| Gases | Emissions |
|------------------|-----------|
| CO ₂ | 28,484.80 |
| CH ₄ | 6,407.50 |
| N ₂ O | 3,285.60 |
| PFC | 107.9 |
| HFC | 380.6 |
| SF ₆ | 59.5 |
| Total | 38,725.90 |

Source: Climate Analysis Indicators Tool (CAIT) Version 6.0, World Resources Institute, Washington, DC, 2009

Emissions – Sinks = Concentration



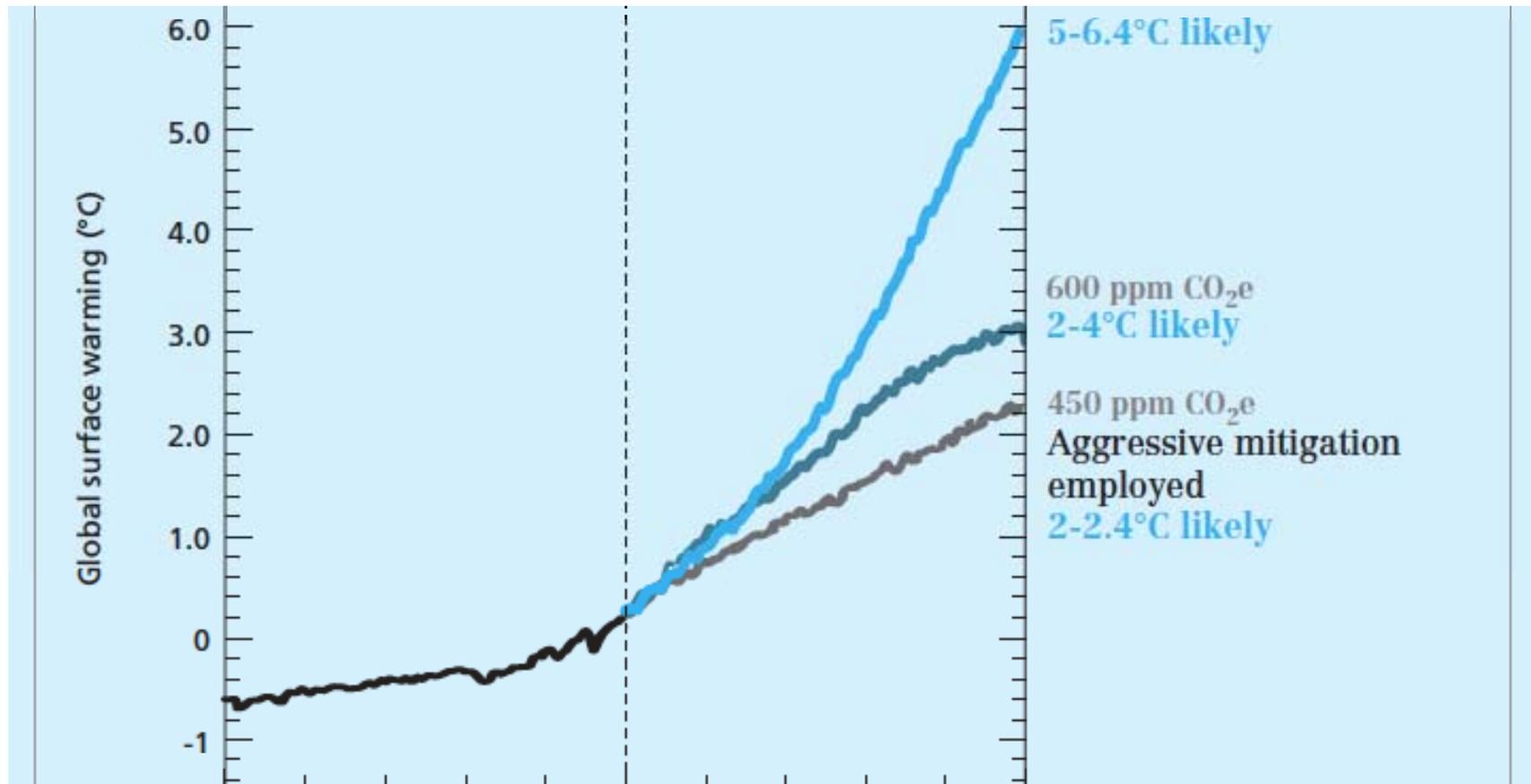
Greenhouse gases: package

- A. Carbon dioxide
- B. Methane
- C. Nitrous Oxide
- D. Halocarbons

In 2005: CO₂ concentration was 383 ppm

In 2005: CO₂ e (all gases) was 430 ppm

Concentration = temperature increase

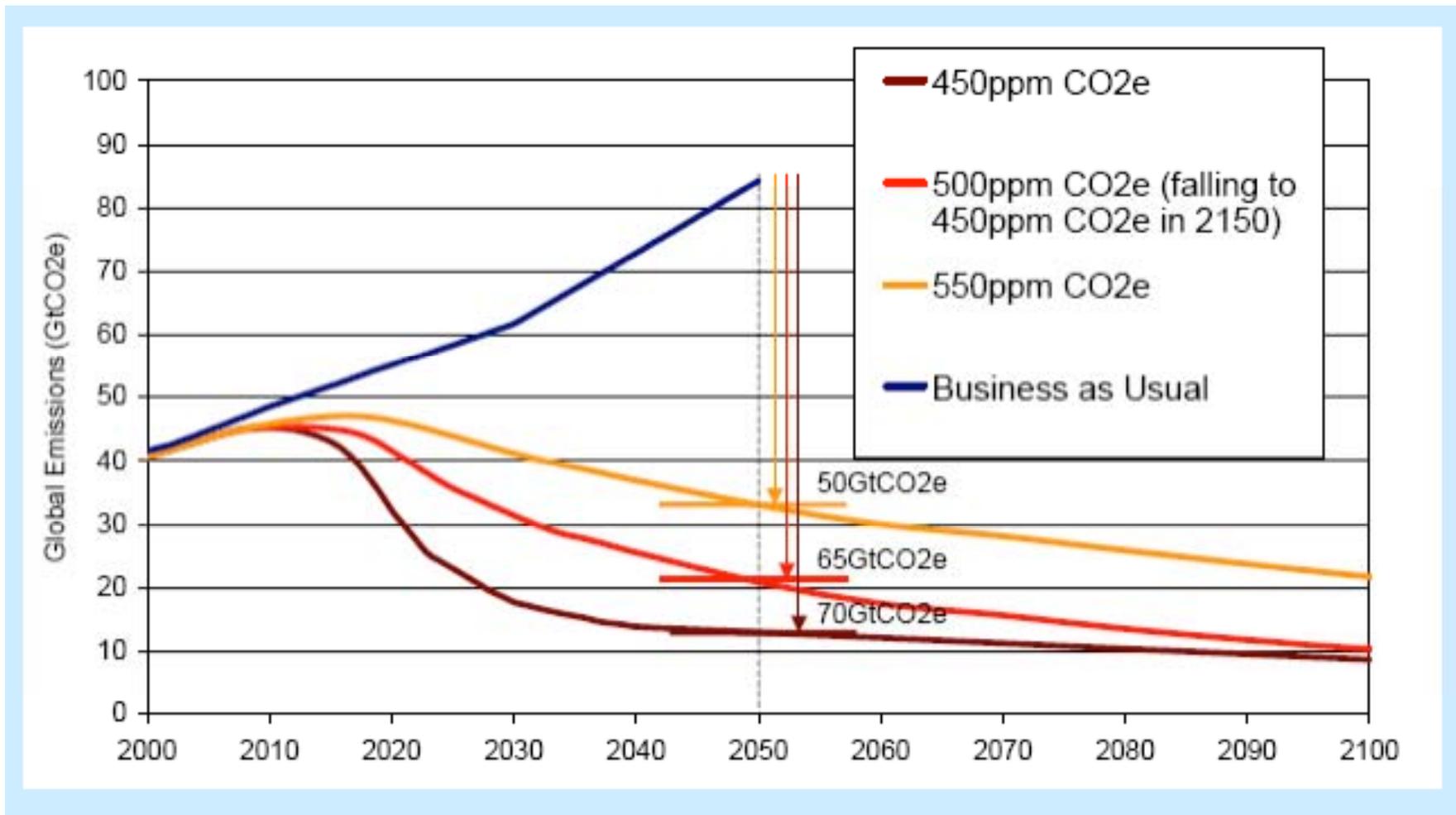


The challenge: 2° C



- z At business as usual: greenhouse gas levels 550 ppm by 2050 = temperature increase of 3-5° C
- z Deadly for world
- z Target is to keep below 2° C
- z Emissions need to be capped **450 ppm (already above 350 ppm)**
- z **Have to cut drastically to meet objective**

Drastic reduction needed: For 450 ppm (2° C) reduce 85% by 2050



Negotiations on **economy** Not ecology



Is related to **economic growth**. No one has built a low carbon economy (as yet)

First climate conference in 1988;

Convention signed in 1992

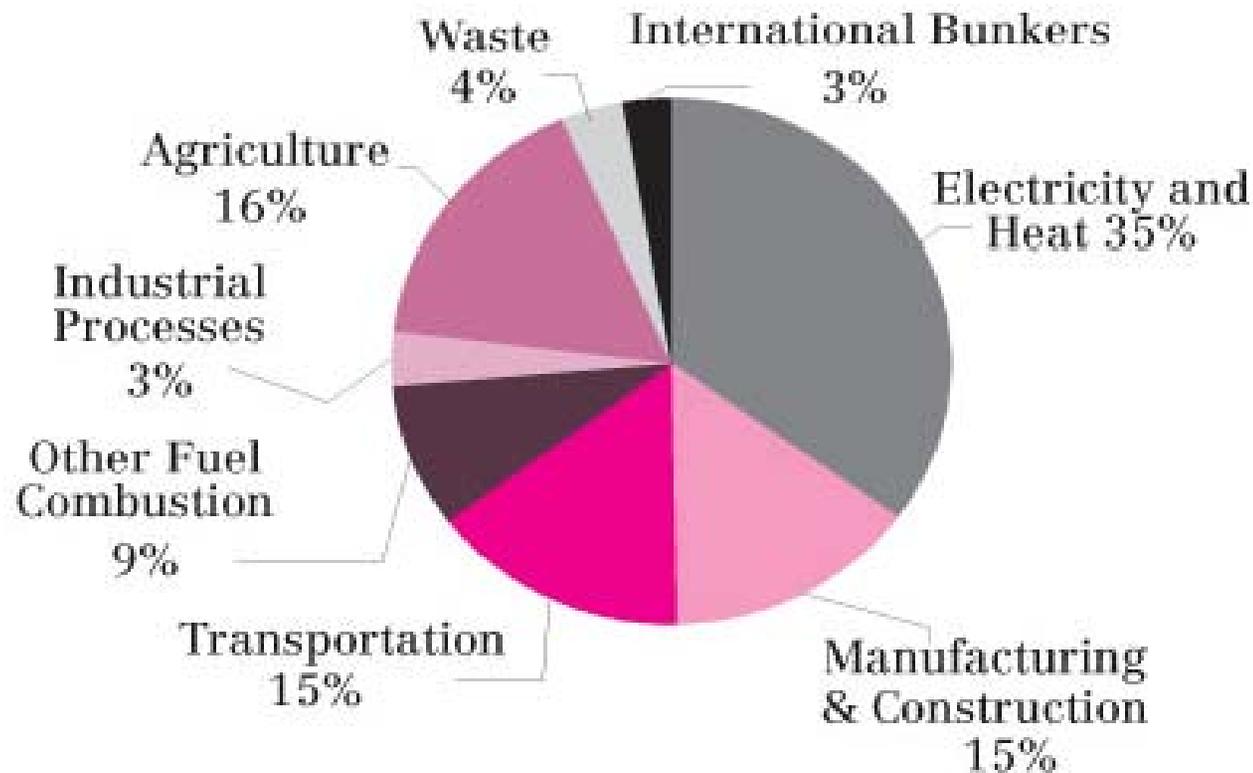
Kyoto Protocol in 1997 – 5% reduction by developed world

Economic growth on line

CC is about economy

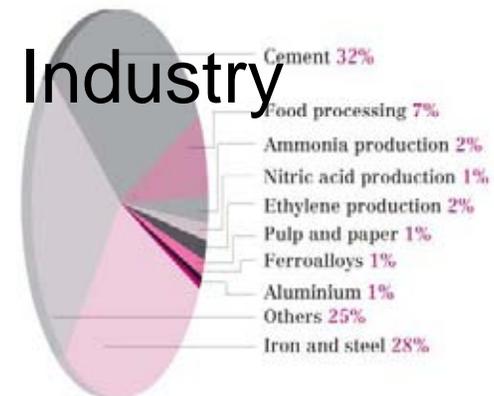
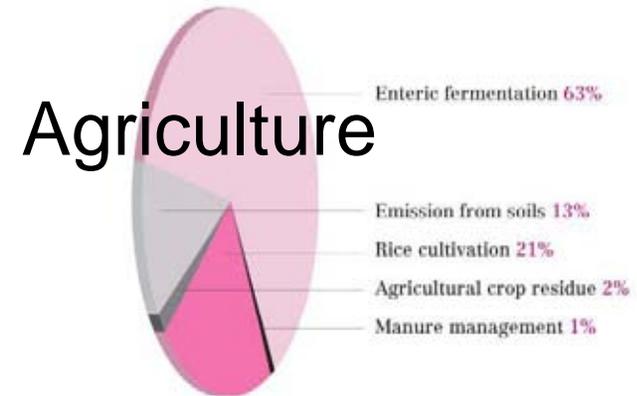
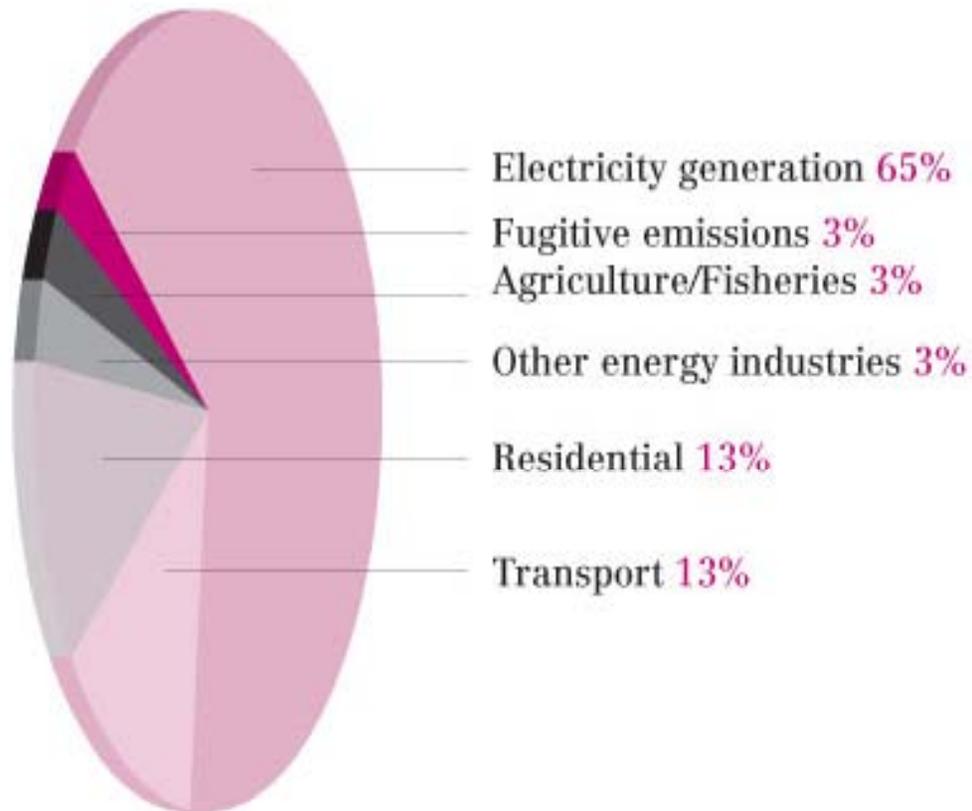


- Climate change linked to economic growth





India's emissions

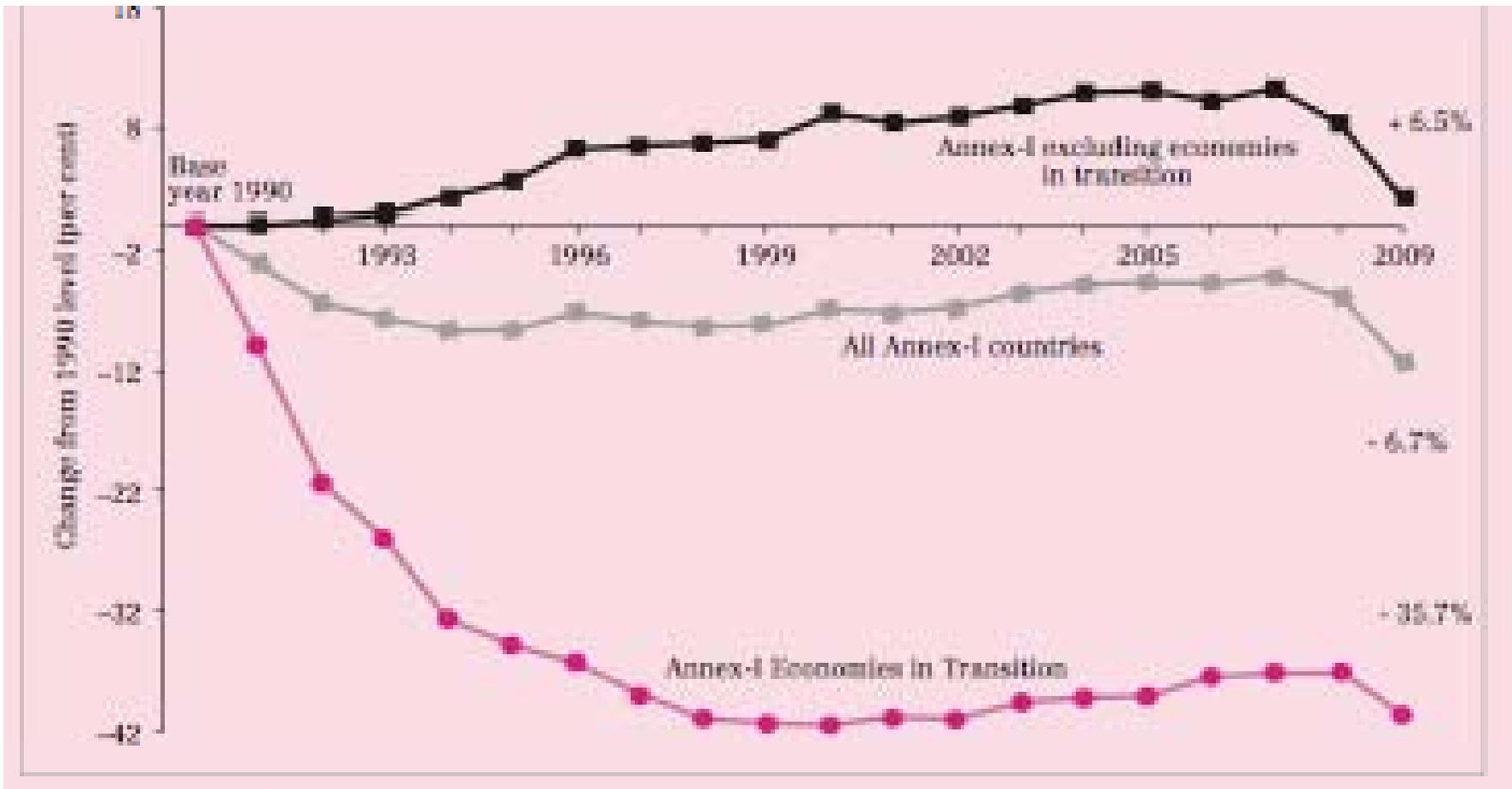


Growth has to be **reinvented**



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- Drastic reduction requires transformation
 - Energy basket to be changed – from fossil to non-fossil
 - Consumption to be reduced drastically
 - As yet, world talks about low-carbon growth but has not found answers

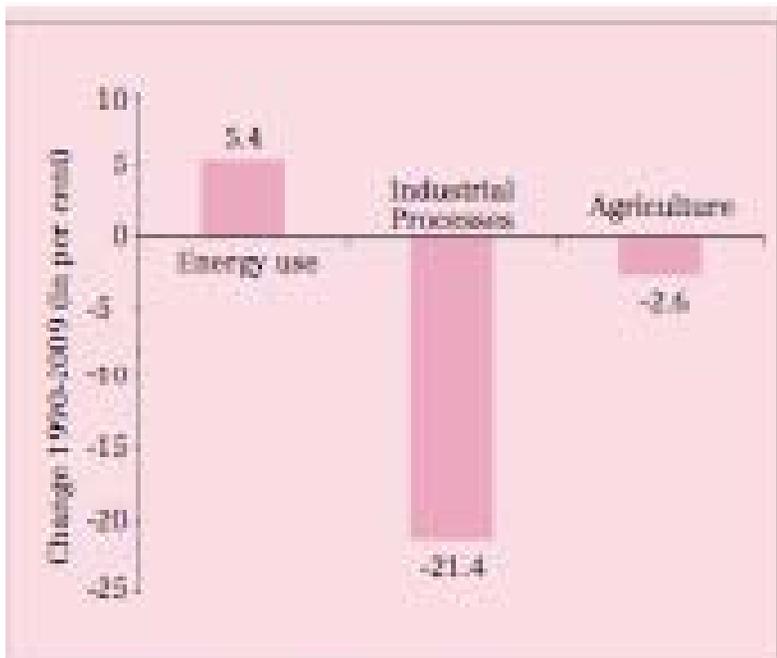
Rich countries: not meeting Kyoto target



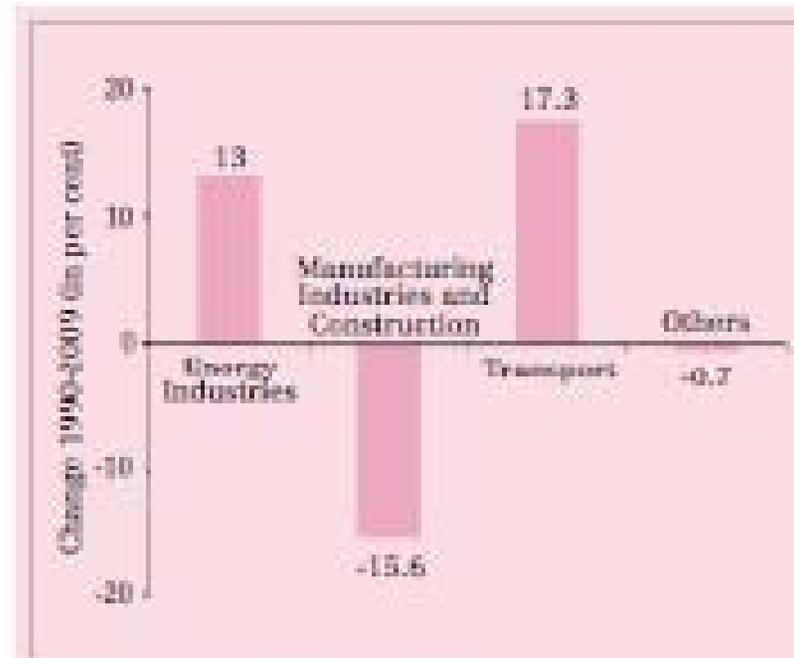
1990-2009: no transition in energy use



Energy emissions **up**; within energy, industry and transport **up**

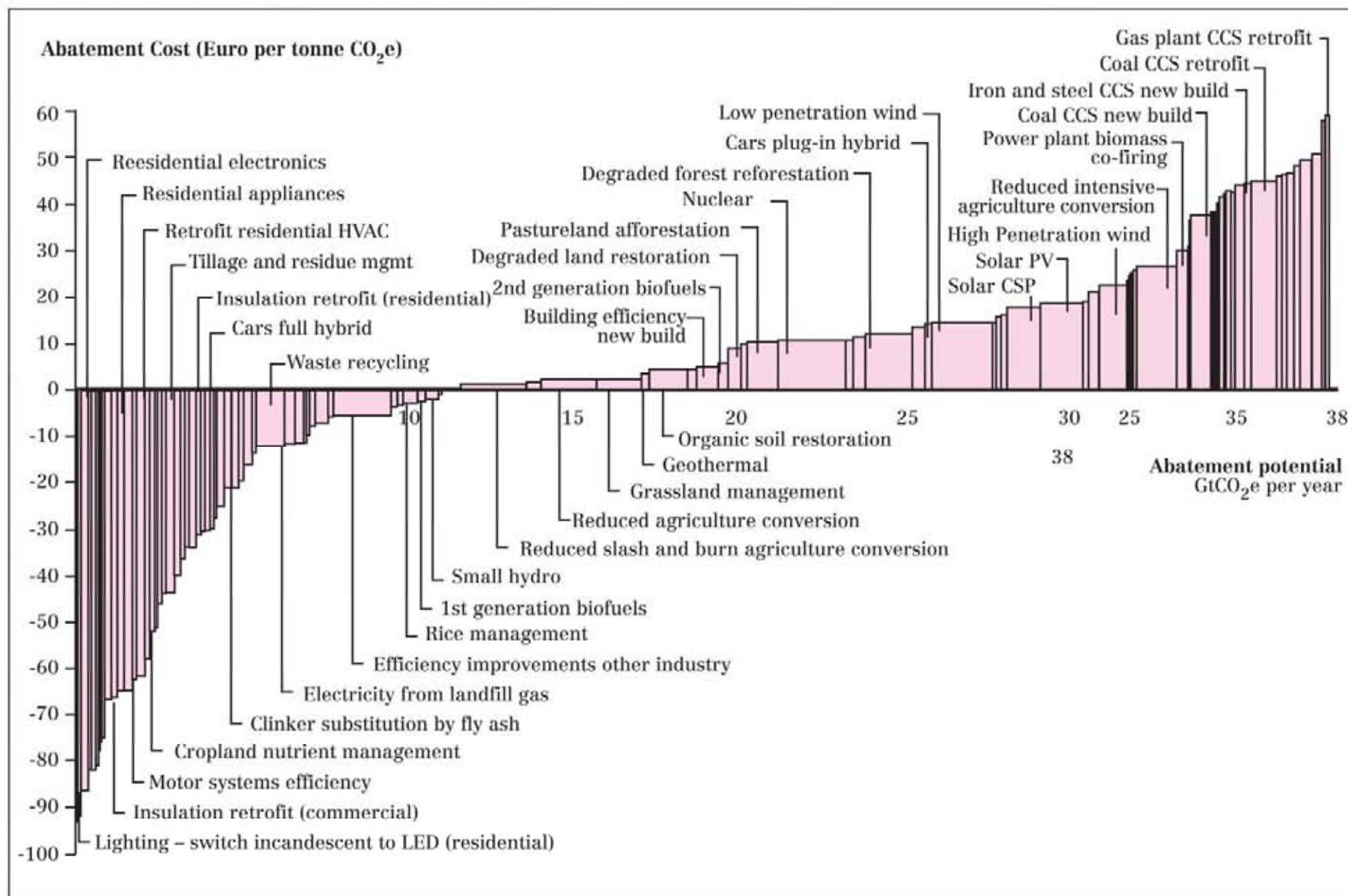


Note: Excludes land use change and forestry
Source: GHG data from United Nations Framework Convention on Climate Change, 2011



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Figure 1: McKinsey's global GHG abatement cost curve



Source: Pathway to a low carbon economy, version 2 of the GHG abatement cost curve, McKinsey & Company

Growth has to be **shared**

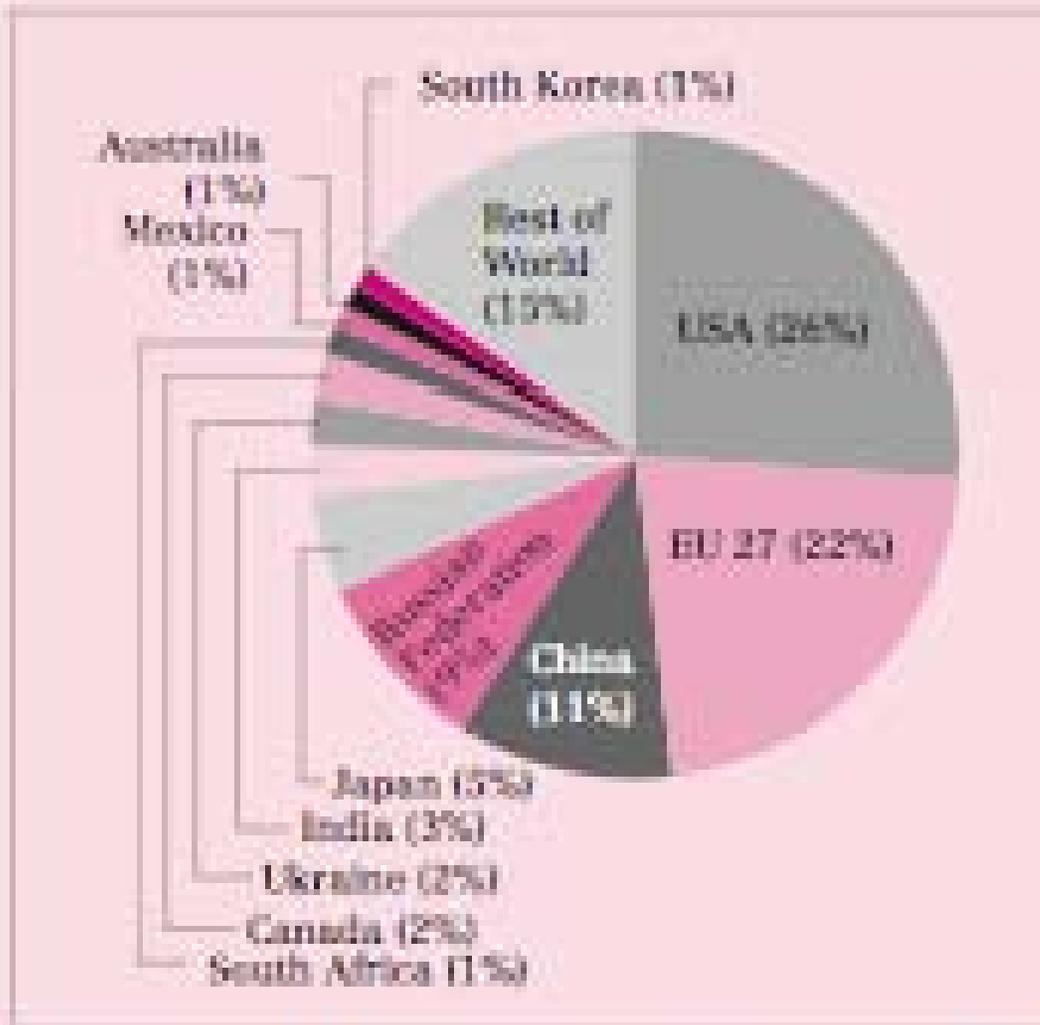


Climate change is about **sharing** growth between nations and between people

The rich must reduce so that the poor can grow. Create ecological space

Cannot freeze inequity

Graph 2: Cumulative CO2 emissions, 1950-2007, without land use

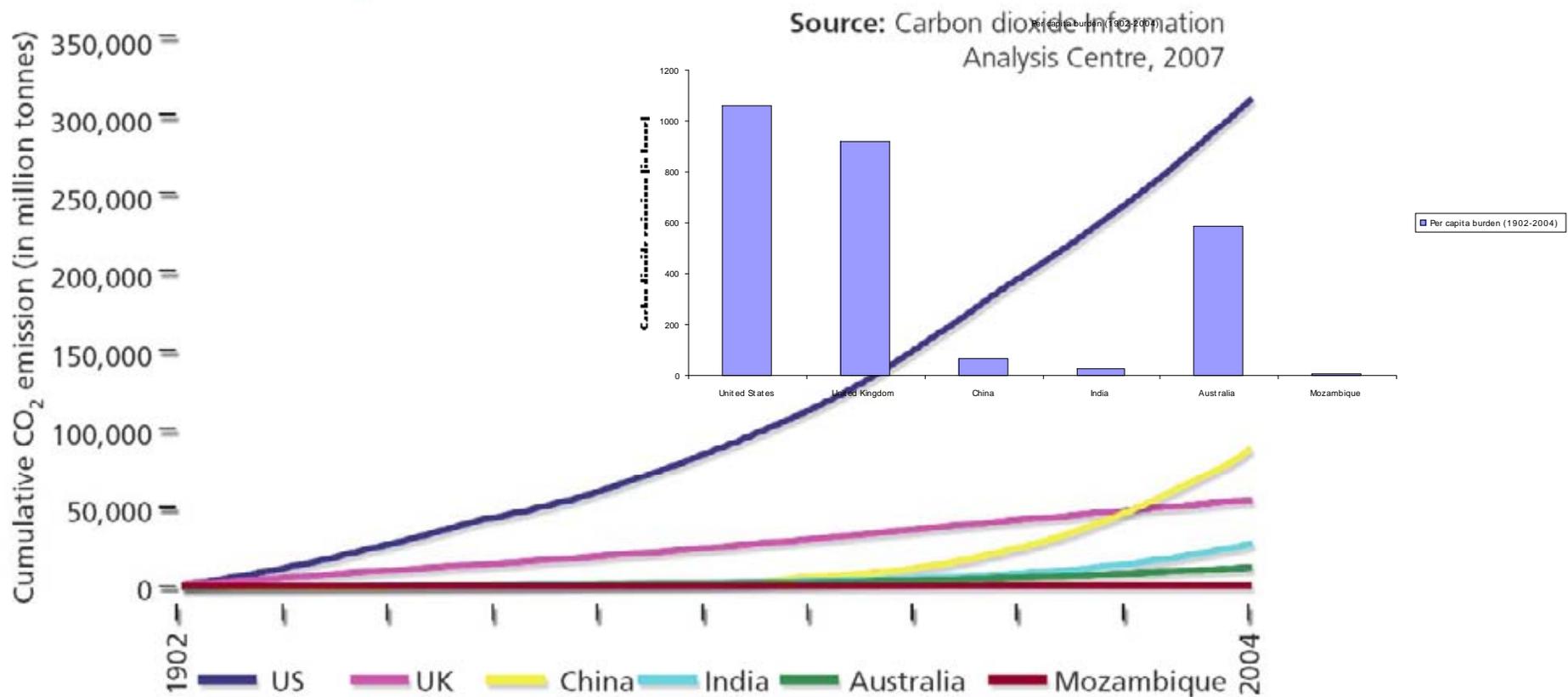


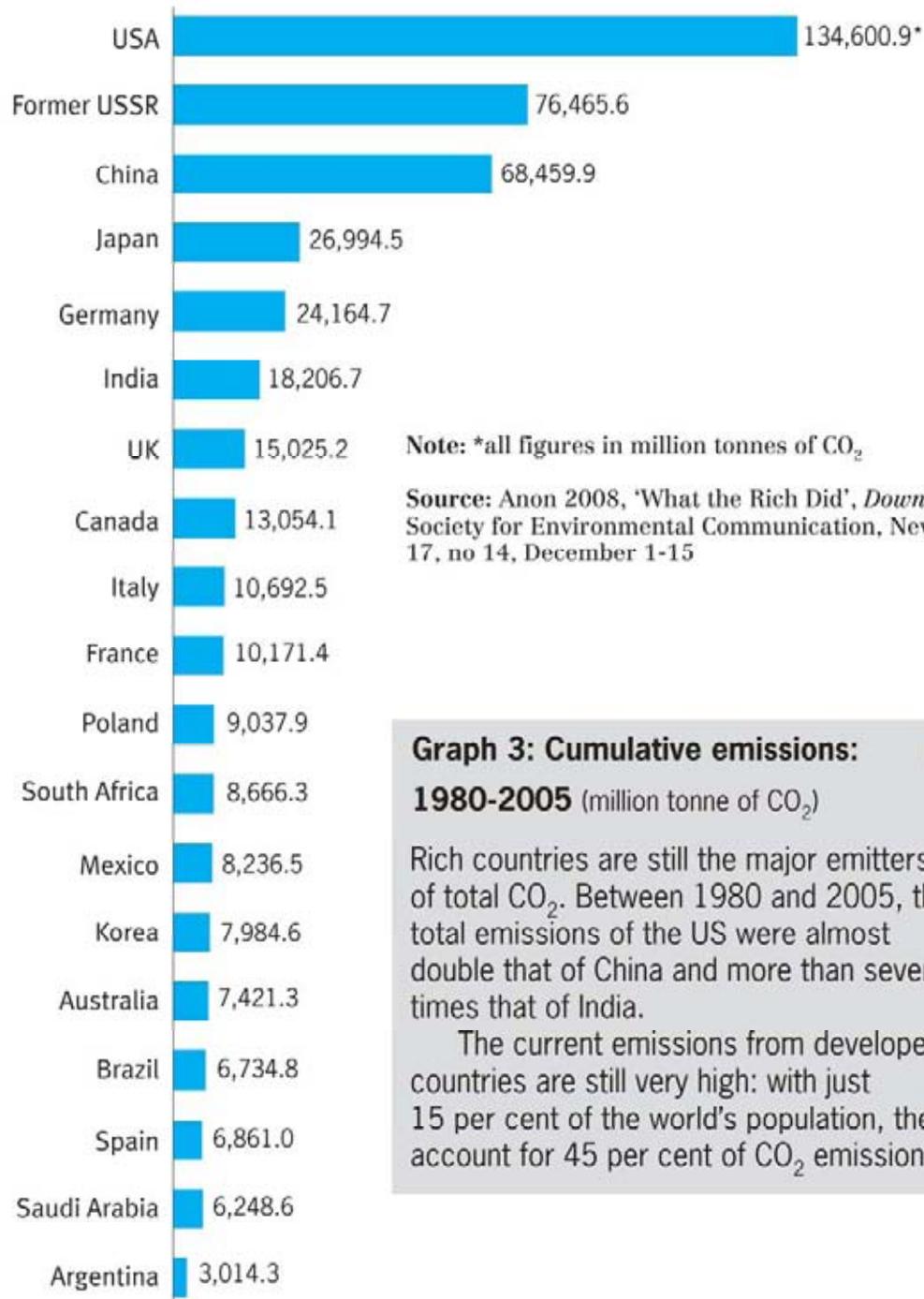
Source: Climate Analysis Indicators Tool (CAIT) Version 8.0. (Washington, DC: World Resources Institute, 2011)

Historical emissions: A tonne of CO₂ emitted in 1850 same value as tonne of CO₂ emitted in 2005



Cumulative CO₂ emissions from fossil fuels, 1902-2004





Note: *all figures in million tonnes of CO₂

Source: Anon 2008, 'What the Rich Did', *Down To Earth*, Society for Environmental Communication, New Delhi, vc 17, no 14, December 1-15

Graph 3: Cumulative emissions:
1980-2005 (million tonne of CO₂)

Rich countries are still the major emitters of total CO₂. Between 1980 and 2005, the total emissions of the US were almost double that of China and more than seven times that of India.

The current emissions from developed countries are still very high: with just 15 per cent of the world's population, they account for 45 per cent of CO₂ emissions.



Present scenario

1 US citizen =

107 Bangladeshis

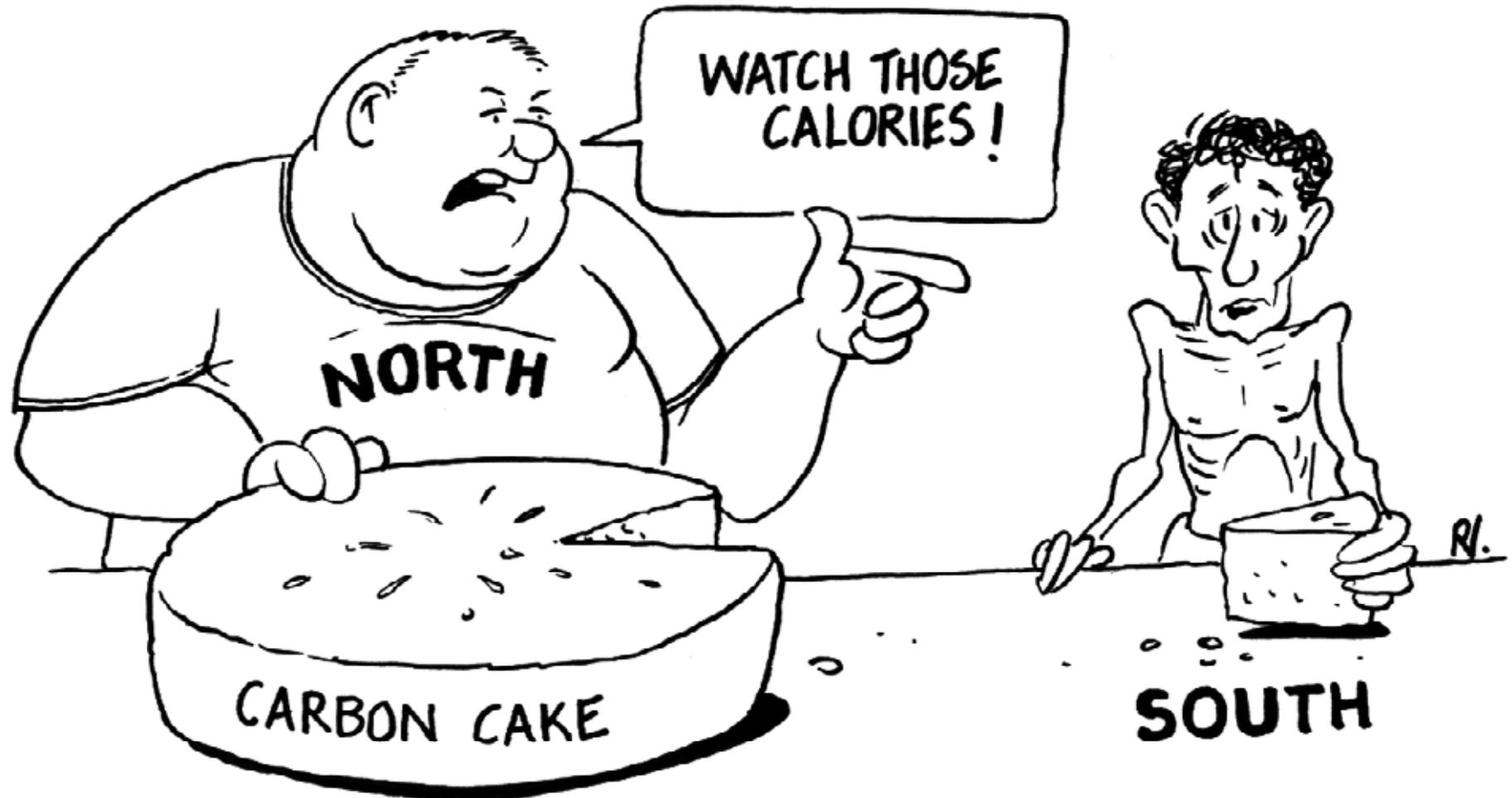
134 Bhutanese

19 Indians

269 Nepalese

Unacceptable. Need to secure ecological space for growth

Acceptable???



Procrastination no option



- In our interest to get an **effective deal**
- But also imperative that deal is based on **principles of equity**
- Our right to development secured

- How? **Possible?**

Climate Talks



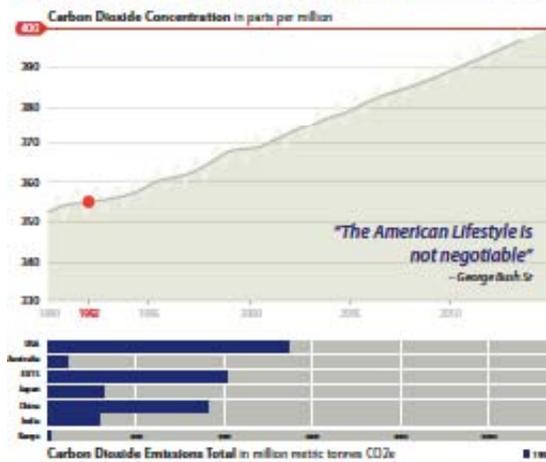
- Negotiations and where they stand?



THE HAPPIEST SOUND IN THE WORLD

Capitalism & Free Market's

THE SOUND OF MUSIC



1992 RIO Earth Summit The Right Notes

LET'S START at the very beginning. A very good place to start. When you read you begin with "We the Rich, boldly agree to commit to reduce emissions you see...". When you sing, you begin with "Well-Why-Me?"

The market God has failed us. Blind faith in the Reagan-Thatcher economic growth is going to cost the Earth. There are limits to growth in a finite planet. In an inter-dependent world - what the rich did yesterday the poor will do tomorrow. We need rules: responsibility of all.

So, for once, the world came together to sign a legally binding framework, based on the principle of common but differentiated responsibility. Those historically responsible would take the lead to cut emissions and create space for rest to grow. Grow, but grow differently. Aided by finance and technology, business unusual was the new game in town.

After all, when you know the notes to sing you can sing most anything, right?

'Differentiation'



- UN Framework Convention on Climate Change 1992 based on the principle that a group of countries (Annex 1) created problem; have to reduce emissions first; create space for the rest to grow
- **Common but differentiated Responsibilities**

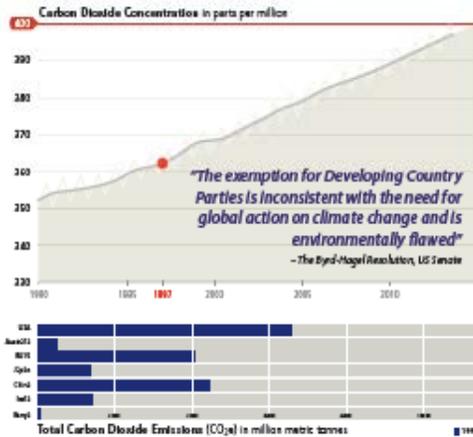
Principles are politics



Principles:

- Rights to the global common
- Historical responsibility of some
- Right to development
- Responsibilities of rest to act based on finance and technology access

Inconvenient truth



1997 COP3 Kyoto Protocol
Not US, You First

DIDNT PLEASE! All, yet the Kyoto Protocol (KP) is the cornerstone of climate action. Fossil giants call KP a 'socialist plot'—as it sets legally binding emission cuts for some countries. Environmentalists decry its lack of ambition—with the industrialized world agreeing to only a 5.2% reduction below 1990 levels. This, when science demanded no less than 20%. Yet it is a step forward.

But even before ink can dry on the document, the plot turns. Amongst shrill calls for its demise, the US Senate votes—95 to 0—against it, calling it fatally and fundamentally flawed. They reject anything that does not include binding targets for developing nations (read India, China). The Rich demand of the Poor, Not US, You first.

Devil is in the detail. Once again, politics of convenience and greed beats science. KP includes a very creative flexible mechanism—pay to cut emissions in the developing world—where everything including life is cheaper. Then use creative carbon accounting to turn balance sheets from red to black.

Live cheaply now and die another day.

Climate Talkies 2010, Created and Produced by Centre for Science and Environment (cseindia.org.in). Supported by Winlab 501710.org

Negotiations: Stuck and pushed



Two-pronged action:

- Do little domestically
- Get India, China, Brazil to take on commitments

- **Break the firewall**

1992-2012:

Rio-Doha: world has changed



- 1992 Annex 1 countries = 70 per cent of annual emissions
- 2012 Annex 1 countries = 43 per cent of annual emissions
- **Rich did not reduce**
- **But rest grew to take up space**
- **Now run out of space**



Cumulative injustice

Cumulative CO₂ emitted since **1890 to 2007**: 1201 gt

Share of cumulative emissions: till 2007

Annex 1: 700 gt (roughly 58-60%)

US share: 333 gt (roughly 28-30%)

Developing country: 501 gt (40-42%)

China: 104 gt (9%)

India: 31 gt (3%)

The budget: 2020



The world must emit by 2020: 40-44 gtCO₂e
to keep it within 1.5° -2° C

Business as usual scenario: 57 gtCO₂e

Reduce: 13-17 gtCO₂e by 2020

Inequity: Frozen



2020 budget: 40-44 gt

Annex 1 will be allowed (with their pledges) =16 gt

US = 6 gt

Developing countries with pledges = 29 gt

India = 3.6 gt

China = 11.2 gt

India remains half of US in 2020. US has 4.5 per cent of the world's population, India has 17 per cent

Money and technology?



- Agreement to provide fast track funds to meet needs of most vulnerable countries – US\$ 30 billion start up; US\$100 billion by 2020
- But no money on the table – juggling with other development assistance to call it new and additional
- Now say recession hit. Cannot pay

Tough negotiations ahead



- World is getting warmer
- Impacts are beginning to show
- Rich did not reduce as committed
- Poor are increasing emissions
- Space has been occupied – historical
- Remaining carbon space is limited
- Funds and technology transfer remain empty promise



-
- **Maneuvering space limited**
 - **But no option but to deal**

Way ahead?



- Two options on table:
- Bottom-up: let countries take action (pledge) and then world will measure (review) how much is done
- Target approach: set budget for world and then divide based on responsibility

Bottoms-up???



- Countries changing baseline from when they will measure action: 2000/2005
- This allows them to peak and then cut
- Countries setting pledges that do not measure up
- US has pledged **17%** below **2005** level (roughly 0-3% below 1990 level)

Right to pollute

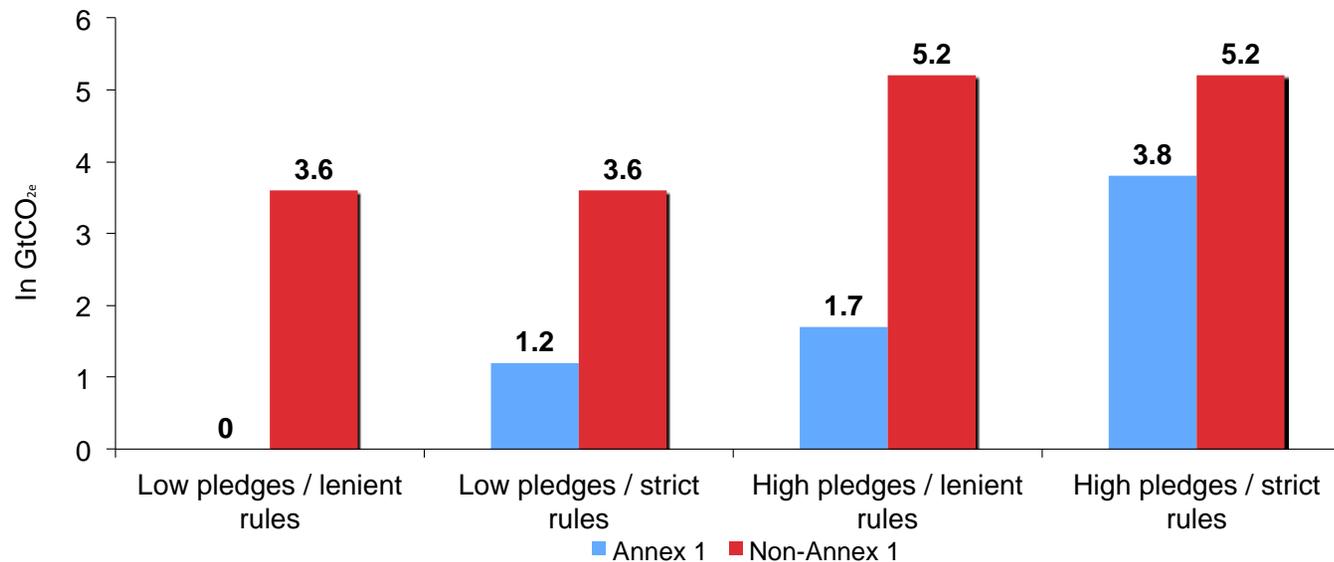


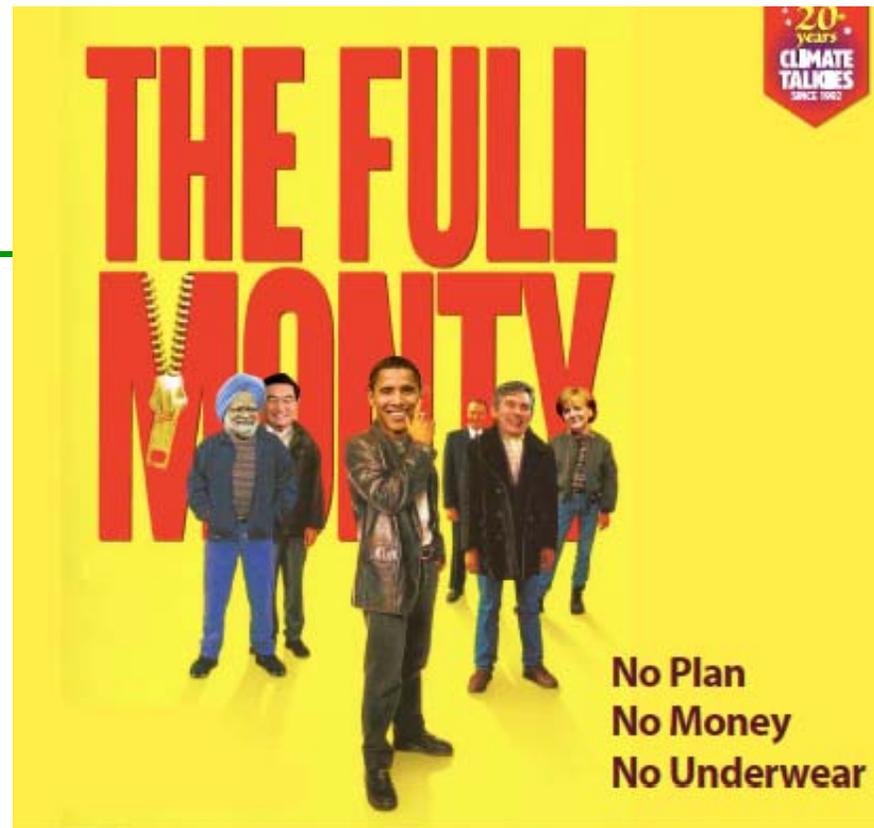
- **Gigatonne gap** – Pledges do not add up to effective action – even **without** double-counting; leakages and loopholes – 2.5° C to 5° C increase expected
- **Cost and burden shifted** – will lead to even less action as countries will argue they have done what they can
-



Shifts the burden of transition

- SEI assessment of UNEP report on 'emission gap' makes clear **'gap is growing'** – between rich and poor





Carbon Dioxide Concentration in parts per million



2009 COP15 Copenhagen Accord
Yes We Can't

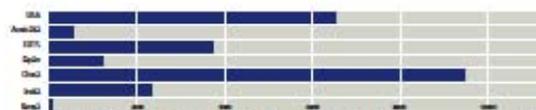
THERE IS new hope and a new president in the White House. A Nobel Peace Prize awaits him in Oslo. There is change in the air: Yes we can.

Heads of State, 115 of them, will arrive—Wen Jiabao, Angela Merkel, Manmohan Singh, Gordon Brown, Lula Da Silva. What do they do?

Australia and US propose a new strategy. No global reduction targets, but each country decides how much and by when. US puts numbers as its way ahead: cut 0-2% over 1990 levels by 2020. India and China also make their bid— all agree to do as little as possible.

Big polluters are happy at the high table. Their bill to the rest: US\$ 30 billion in the short-term and US\$ 100 billion by 2020. Carrot for the rabbits. Stick for the Planet. But the plan goes horribly wrong. It is now 24 hours after the conference should have ended. Small countries revolt. The accord is rejected. It is only noted.

Stepped all the way.



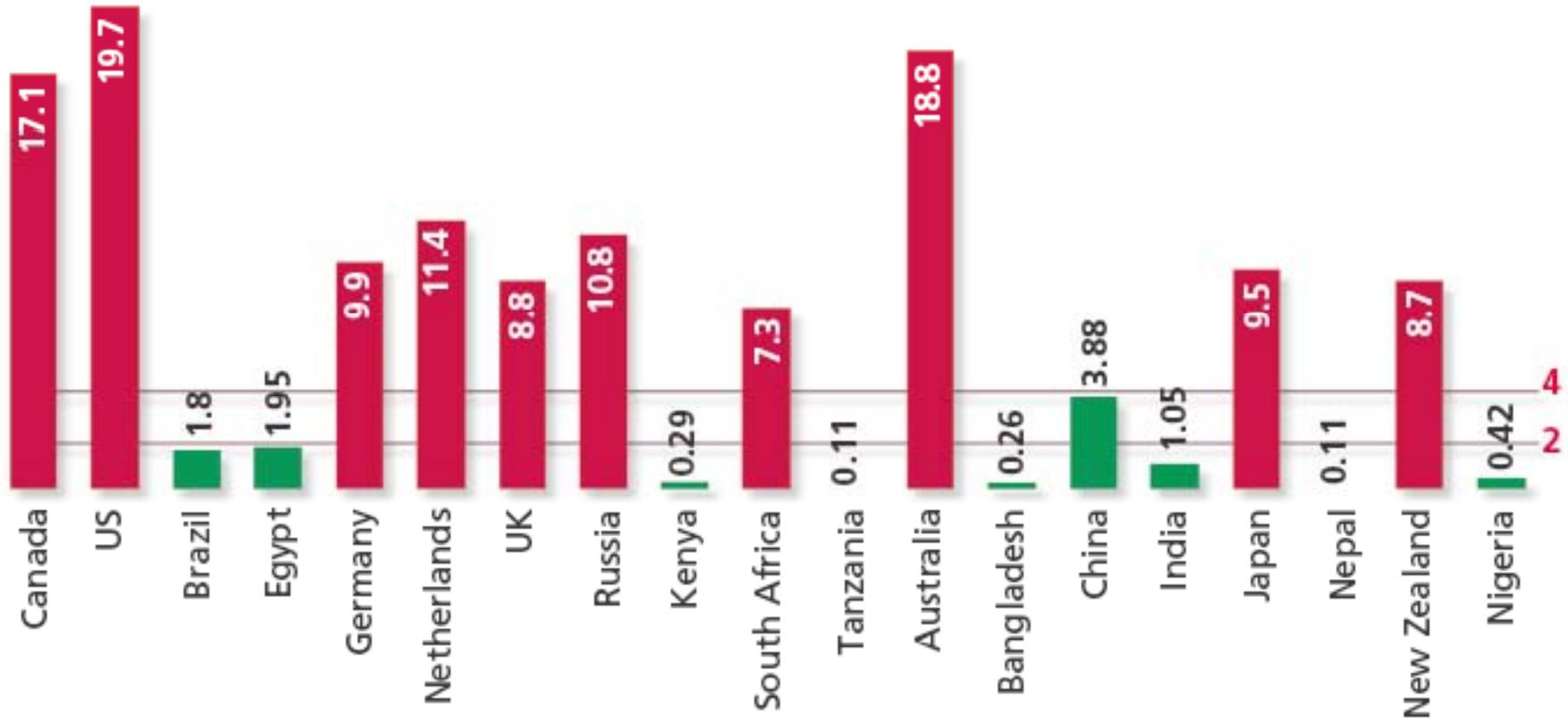
Carbon Dioxide Emissions Total in million metric tonnes CO2e



Right to **development**

- Will involve all countries
- All will live within limits set by the planet
- Emission cuts will be based on science; ambition to cut drastically to stay within **at least 2° C**
- **Limits will be for all**; based on equitable sharing of common atmospheric space

Limits to be set on all Based on planetary boundaries



Agenda for CoP 19: Warsaw



Agenda 1: Mitigation post 2020

1. Countries to 'pledge' what they will do for 2015 deal: (**bottom-up**)

2. Later there will be a **review** to check adequacy – if the world is within target of 2 degrees or not (**top-down**)

Warsaw agenda



Agenda 2: Mitigation before 2020

- Focus on short-lived climate forces – gases that do not last in the atmosphere but are still greenhouse gases
 - A. HFC
 - B. Black carbon
 - C. Methane

Warsaw agenda



Agenda 3: More mitigation

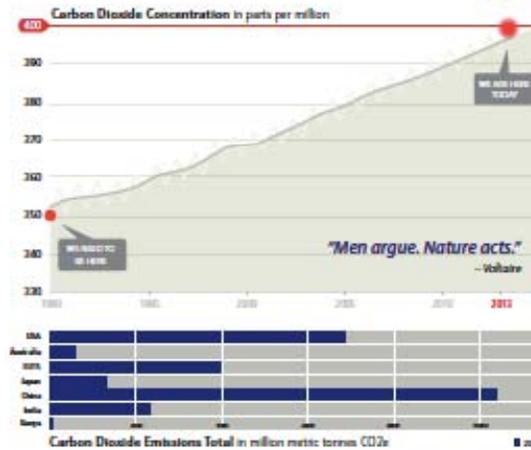
- A. Renewable Energy
- B. Fossil fuel subsidy

Agenda 4: Loss and Damage

- Estimating the cost of adaptation and creating a fund



Dumb happens.



2013 COP19 Warsaw So can smart

COMBATING CLIMATE change will need collaboration. Collaboration will need fairness and equity. This is a pre-requisite.

The world has to de-link economic growth with carbon dioxide emissions. This is the challenge. The emission reduction targets must be drastic, binding and applicable to all, based on historical responsibility and fair allocation. The world must look for business unusual answers. And so it must move beyond efficiency to sufficiency. Climate change will not be solved by techno-fix solutions. Our consumption cannot cost us the earth. More importantly, consumption of rich will have to reduce to allow for the poor to grow.

This can happen. A leapfrog can be made across the world to build clean energy economies. A fossil fuel free future is possible. But this future must not be for few. It should be for all. Energy access is as important as renewable energy.

Our world needs leaders and not followers.

New deal



World running out of space and time

- Must raise ambition
- Must create framework for all to reduce; based on limits for all

Need deal based on equity and fairness

No effective global deal without equity

- Will not derail process; will strengthen it

Equity is pre-requisite



Is about **cooperation**. If the rich emitted yesterday, the emerging rich world will do today and tomorrow

Cooperation demands equity and fairness

Effective action only possible with equity