Negotiating a Global Climate Agreement (using the C-Roads Climate Policy Simulation)

Lecture 7

Recitation 4

eDMP: 14.43/15.013/21A.341/11.161

Purpose of C-ROADS

(Climate Rapid Overview And Decision Support)

Developed by MIT Sloan Professor John Sterman & colleagues to improve understanding of important climate dynamics among

- ✓ **Policymakers & negotiators**
- ✓ **Businesses, Educators, Civil Society**
- ✓ **Media**
- ✓ **The public**

to help ensure that climate policy is informed by vetted, peer-reviewed science.

Welcome Delegates to COP 18 of the UNFCCC!

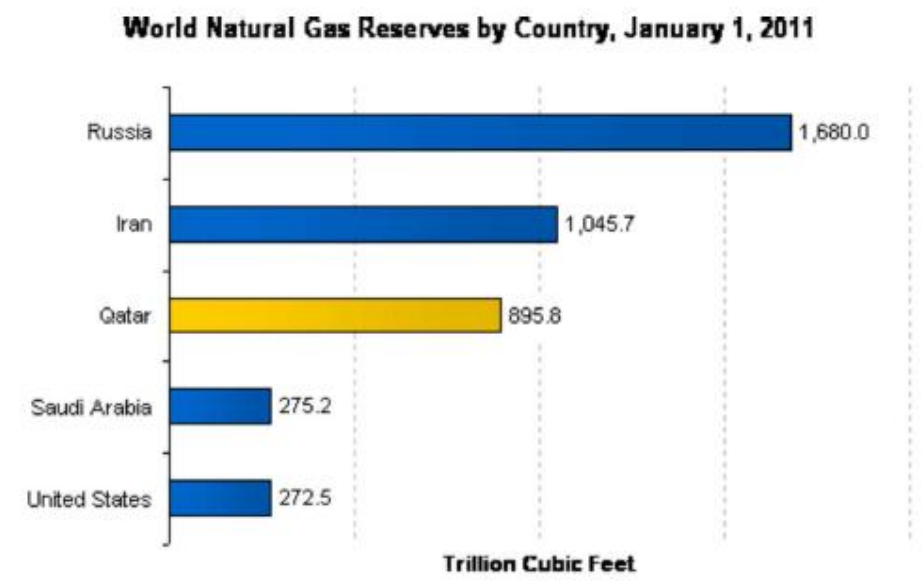
Doha, Quatar

November 26, 2012

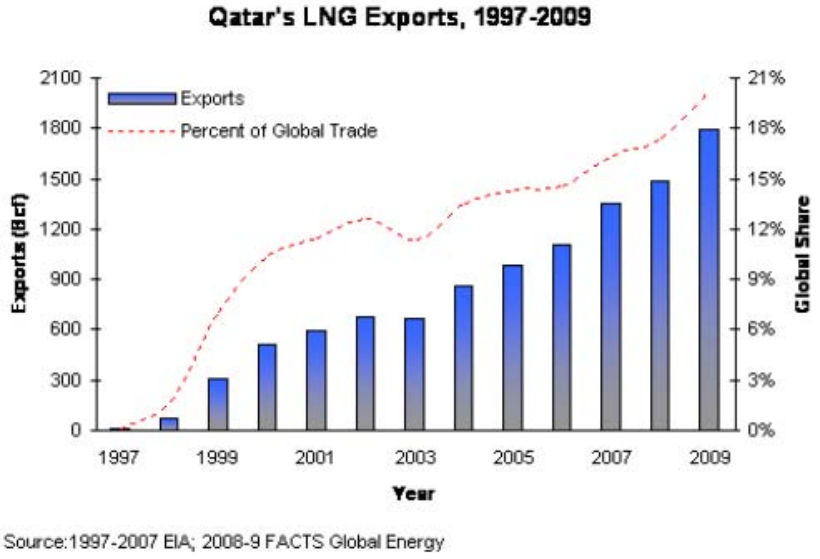
United Nations logo removed due to copyright restrictions.

Durban agreement, 2011: EU will continue its ETS, ALL nations agree to consider future restrictions, $100 billion in aid by 2020

Here's Where You Are



Source: Oil & Gas Journal, Jan. 1, 2011 and EIA *Natural Gas Navigator* (U.S. only), Dec. 31, 2009.



Source:1997-2007 EIA; 2008-9 FACTS Global Energy

Quatar's 2009 GDP/capita was $61, 500 > $45,800 for the U.S., but Quatar is NOT an Annex I nation.

Your Roles

- **Developed Nations**

  Led by **US, EU, Japan**, but also Russia/FSUs/ Eastern Europe, South Korea, Australia/NZ, Canada

- **Developing A**

  Led by **China, India, Brazil**, but also South Africa, Mexico, Indonesia, Phillipines, Thailand, Taiwan, Hong Kong, Malaysia, Pakistan, Singapore

- **Developing B**

  Small Island Nations and "LDCs", representing Other Small Asia, Central/South America, Middle East, Bangladesh

Initial Process

- **Break into negotiating blocs**
- **Introduce yourselves to members of your bloc**
- **Read Briefing Memo for your bloc (again…)**

Our Global Task:

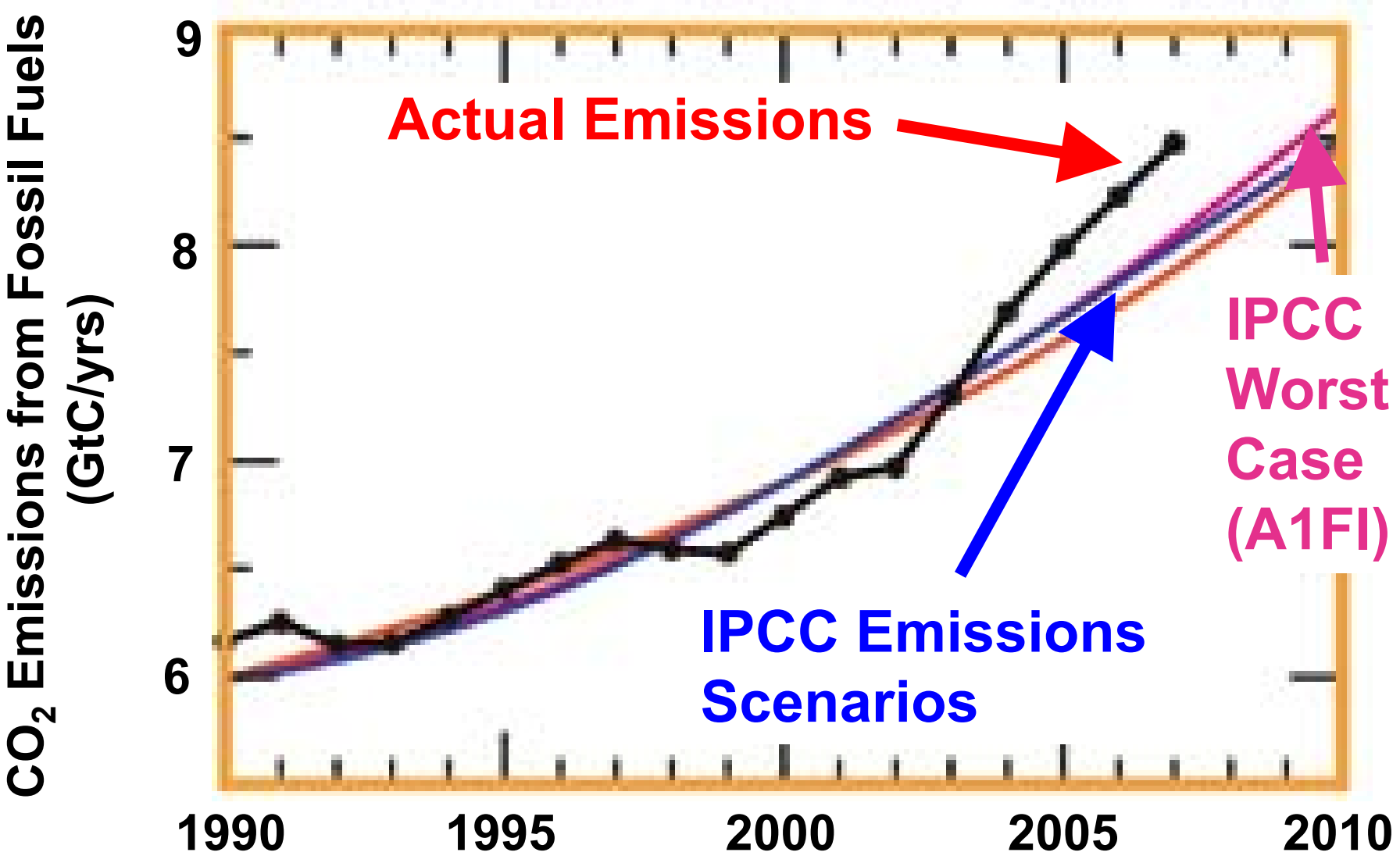
Manage the Unavoidable

and

Avoid the Unmanageable

Actual CO_2 Emissions vs. IPCC Assumptions

Emissions exceed IPCC Worst-case Scenario:



Source: U.S. Global Change Research Program. *Global Climate Change Impacts in the United States.* New York: Cambridge University Press, 2009.

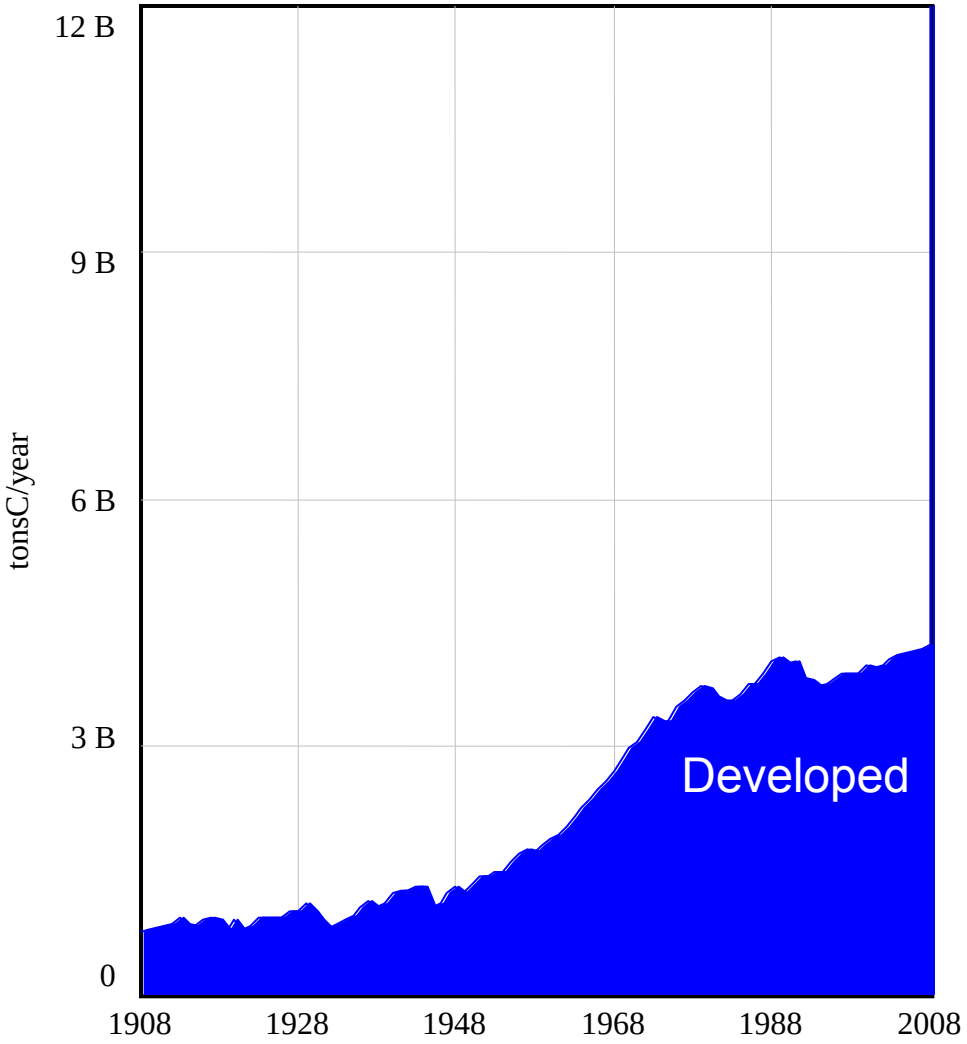
The Copenhagen Accord, Paragraph 1 (12/09)

1. We underline that climate change is one of the greatest challenges of our time. We emphasise our strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities. To achieve the ultimate objective of the Convention to stabilize greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, we shall, recognizing the scientific view that the increase in global temperature should be below 2 degrees Celsius, on the basis of equity and in the context of sustainable development, enhance our long-term cooperative action to combat climate change. We recognize the critical impacts of climate change and the potential impacts of response measures on countries particularly vulnerable to its adverse effects and stress the need to establish a comprehensive adaptation programme including international support.

Your Goals

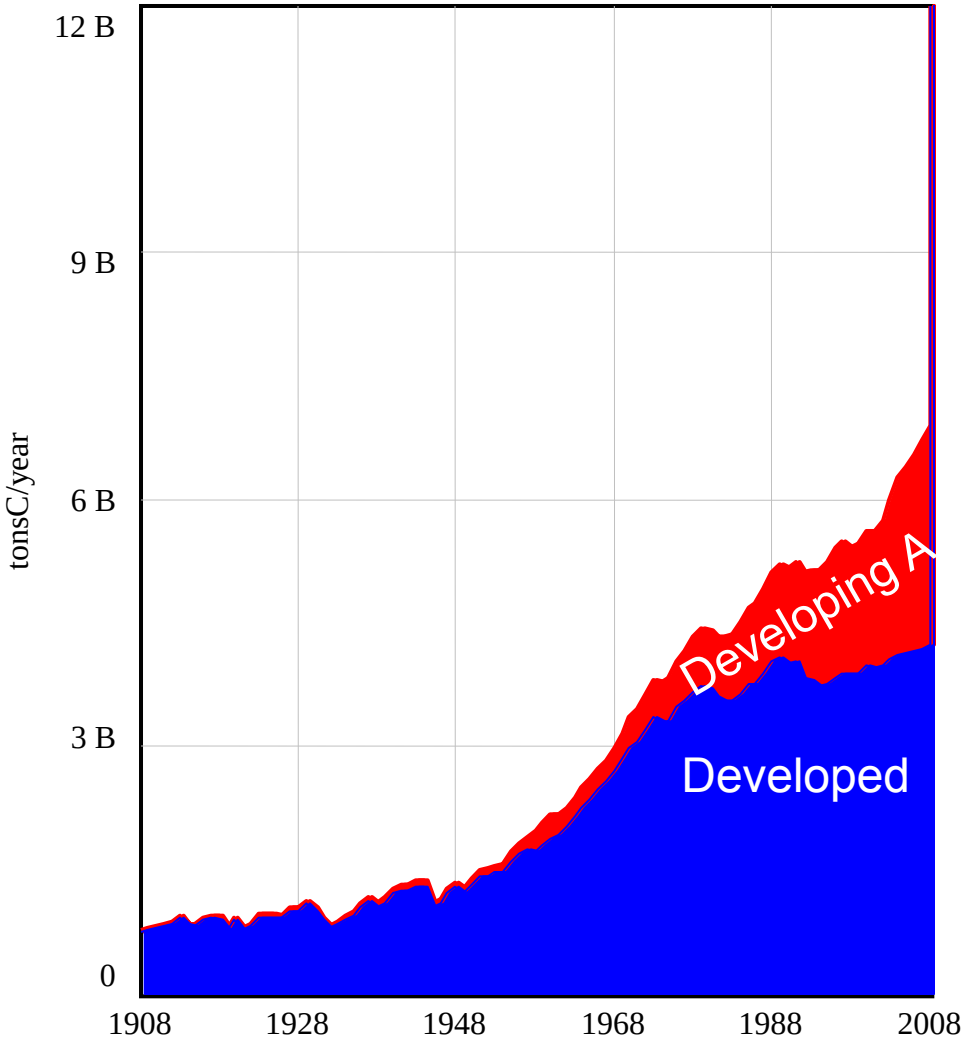
- **A real, binding agreement, beyond Durban**
- **Achieve emissions reduction commitments to stabilize GHG levels by 2100 at a level that limits global warming to no more than 2° C above preindustrial levels (ignoring uncertainty)**
- **Agree on a fair deal (i.e., one that you can sell at home!) to share costs of mitigation and adaptation fund to aid less developed nations.**

Developed Nations: Steady Growth in Emissions



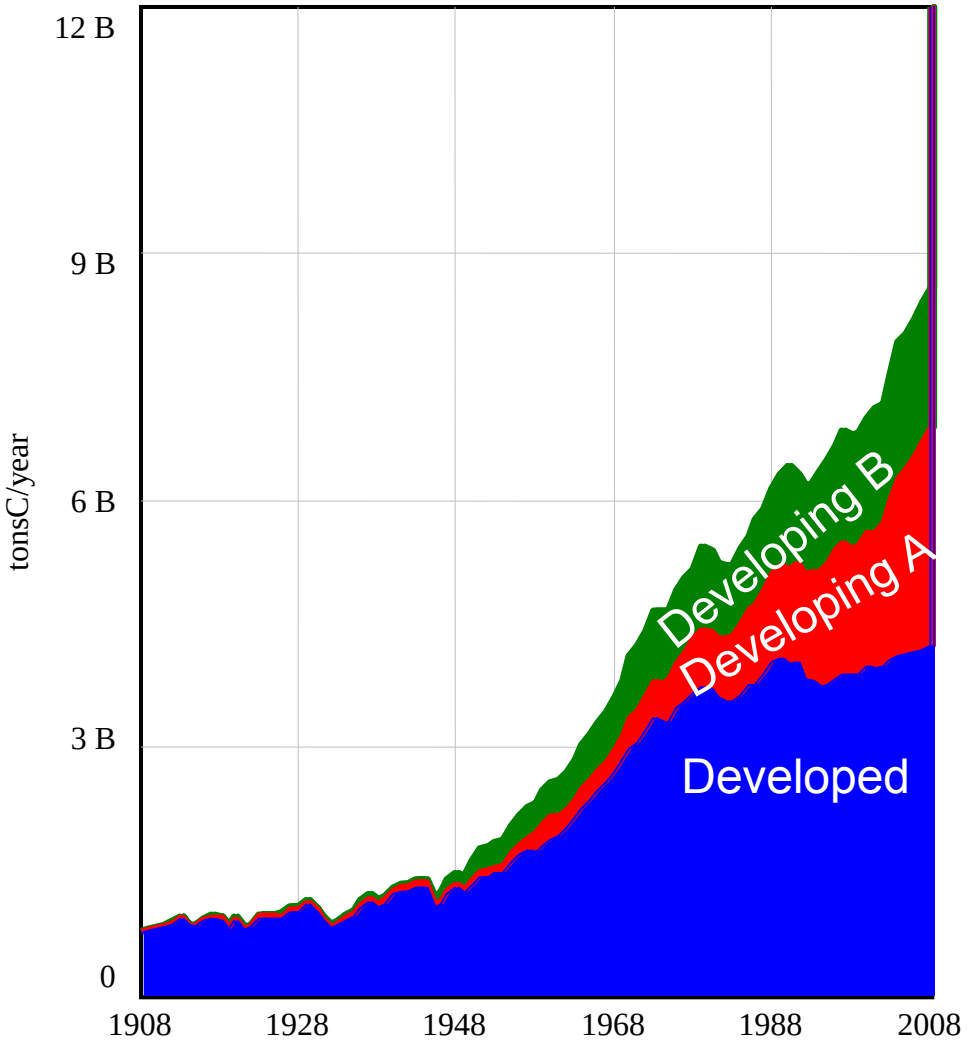
Source: CDIAC, WEO, C-ROADS

Developing A Nations: Emissions Rising



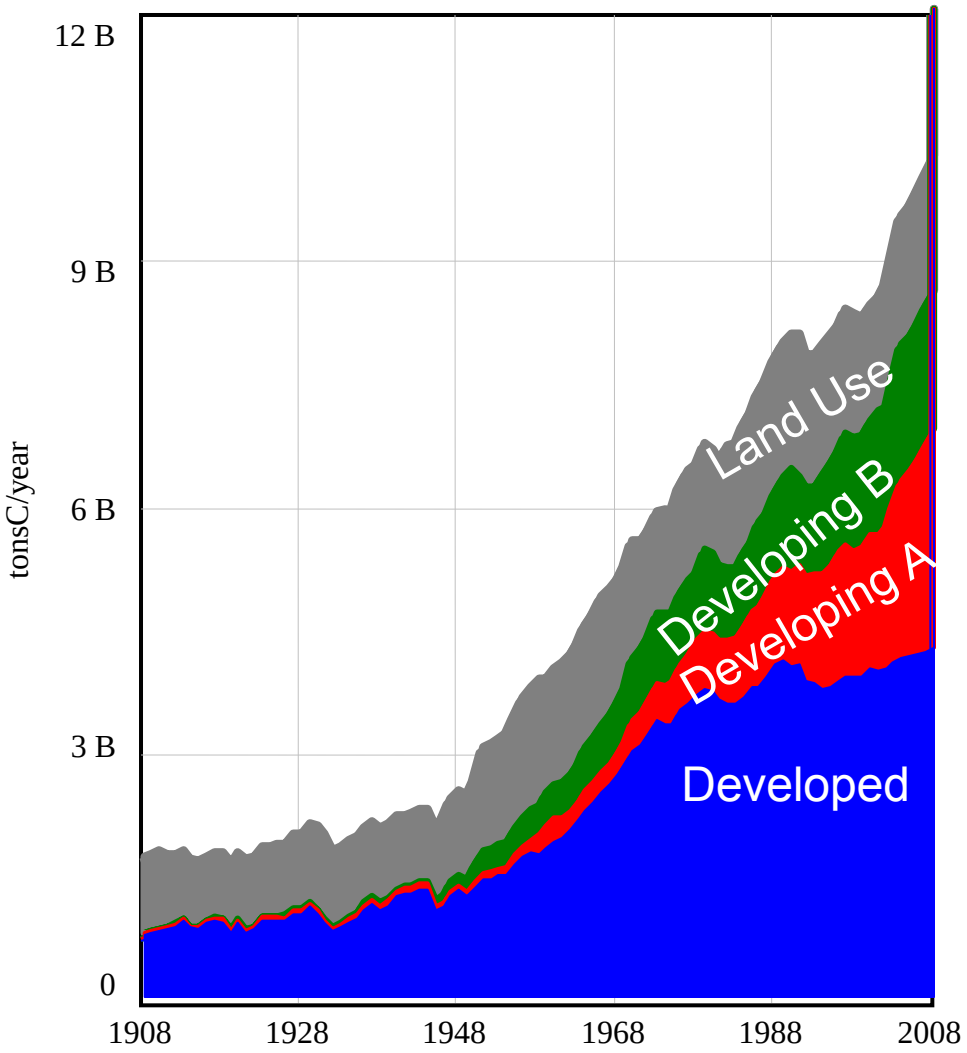
Source: CDIAC, WEO, C-ROADS

Developing B Emissions Rising



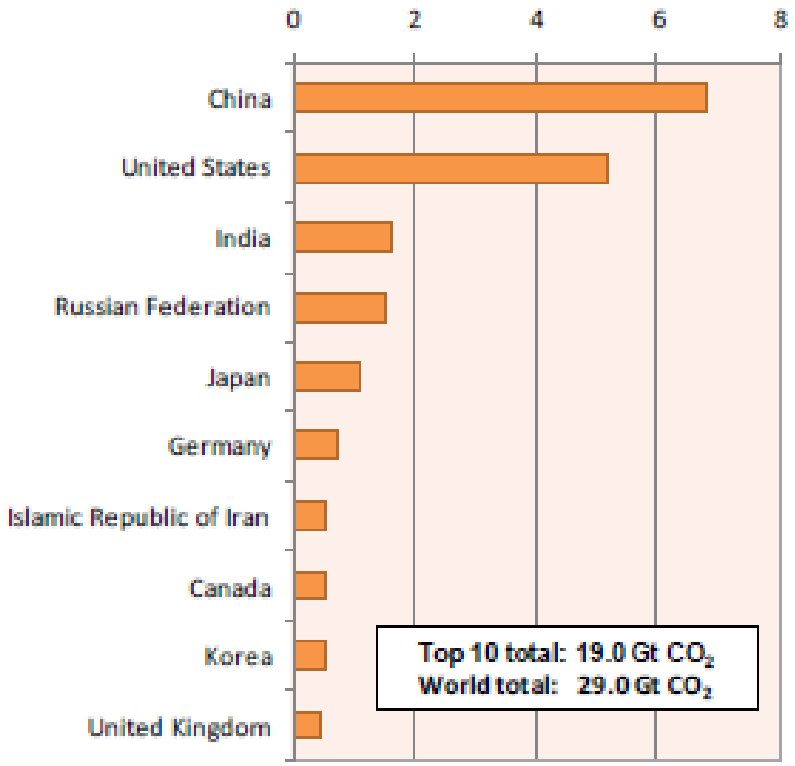
Source: CDIAC, WEO, C-ROADS

Fossil Fuel and Global Deforestation



Source: CDIAC, WEO, C-ROADS

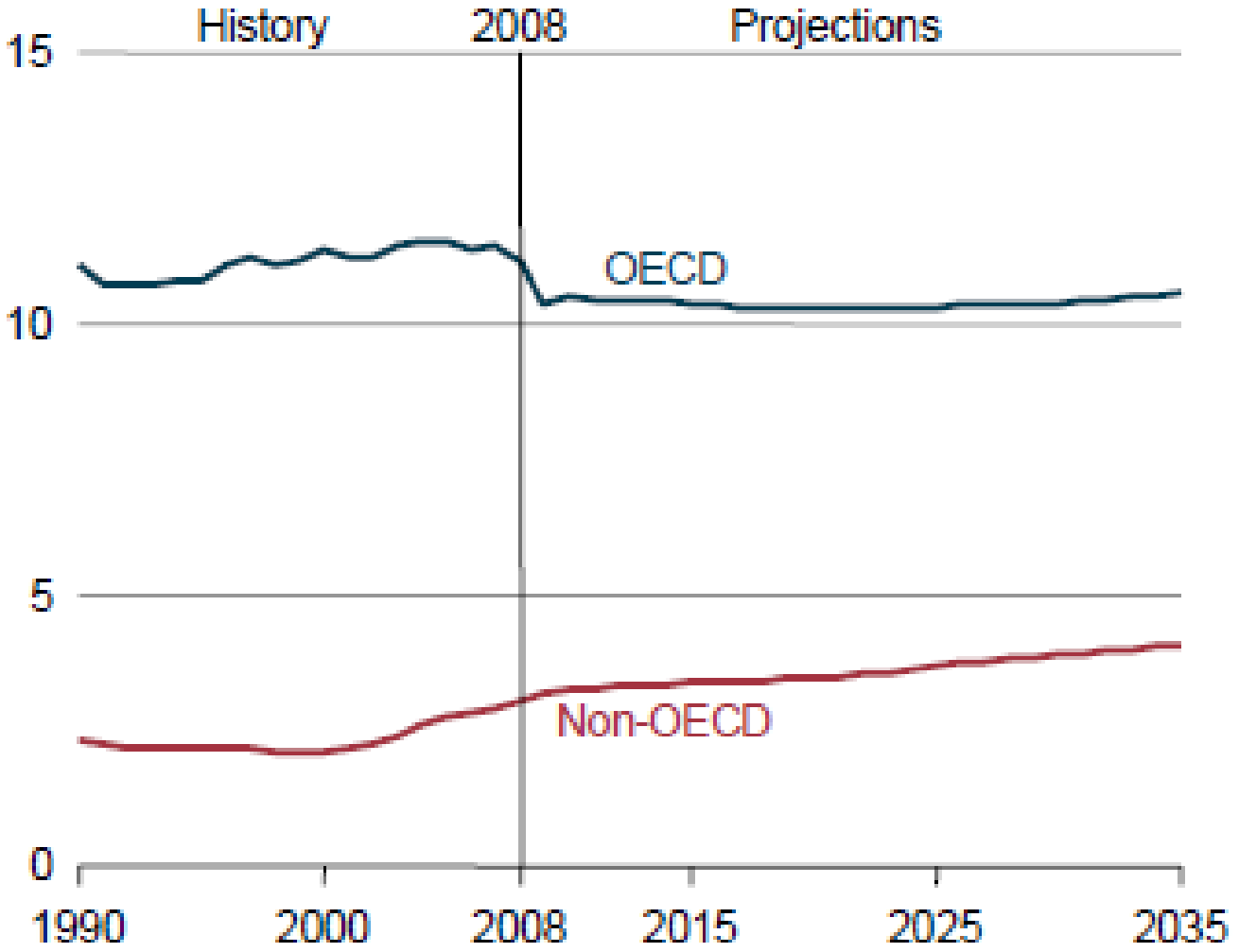
CO_2 Emissions from Fossil Fuels: 2009



Key point: The top 10 emitting countries account for about two-thirds of the world CO_2 emissions.

Source: International Energy Agency, gigatons CO_2

Figure 11. World carbon dioxide emissions per capita, 1990-2035 (metric tons per person)



Source: U.S. Energy Information Administration. *International Energy Outlook 2011*. Washington, DC: Government Printing Office, 2011, p. 7.

Top CO_2 Emitting Countries per Capita: 2008

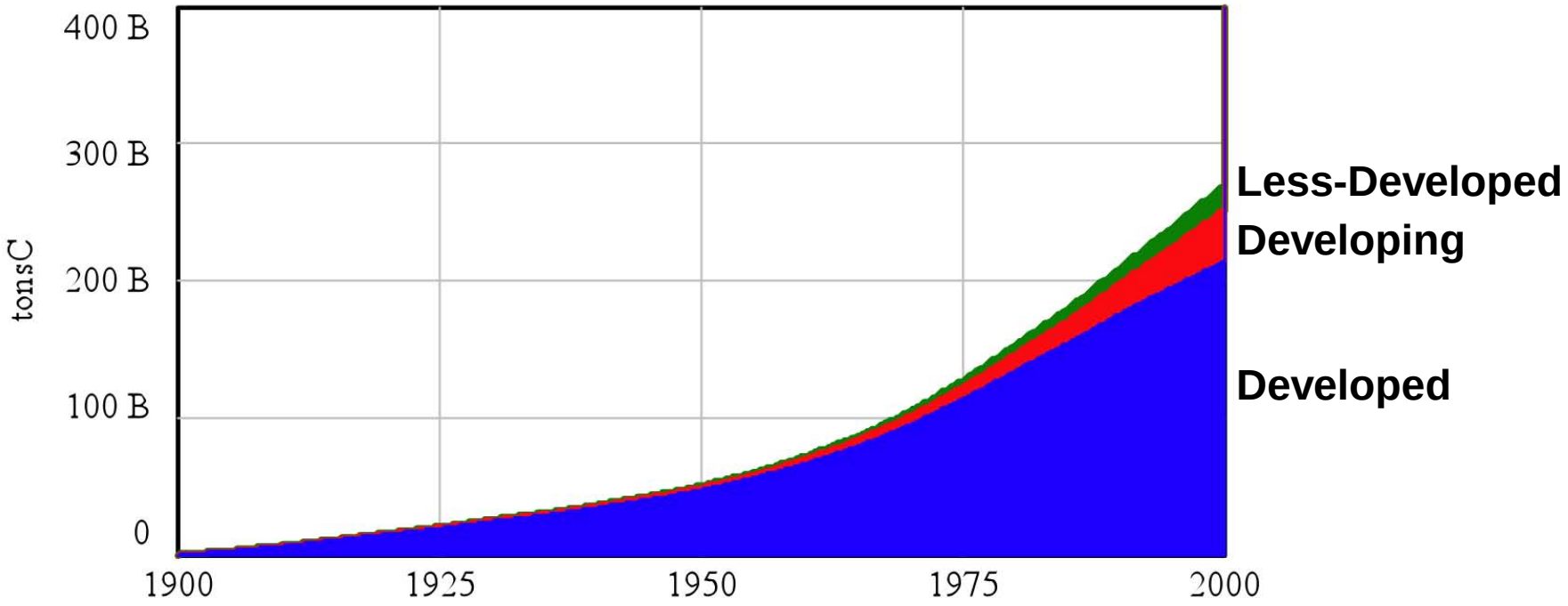
Rank	Country	2008
1.	Qatar	53.5
2.	Trinidad and Tobago	37.3
3.	United Arab Emirates	34.6
4.	Netherlands Antilles	31.9
5.	Bahrain	29.0
6.	Brunei	27.0
7.	Kuwait	26.3
8.	Luxembourg	21.9
9.	Aruba	21.7
10.	Falkland Islands	19.6
11.	Australia	18.9
12.	United States	17.5

Only the US makes both lists

On this list, only the US, Australia, and Luxembourg are Annex I nations

Source: Wikipedia from US DOE CDIAC

Cumulative CO2 Emissions from Fossil Fuel Use



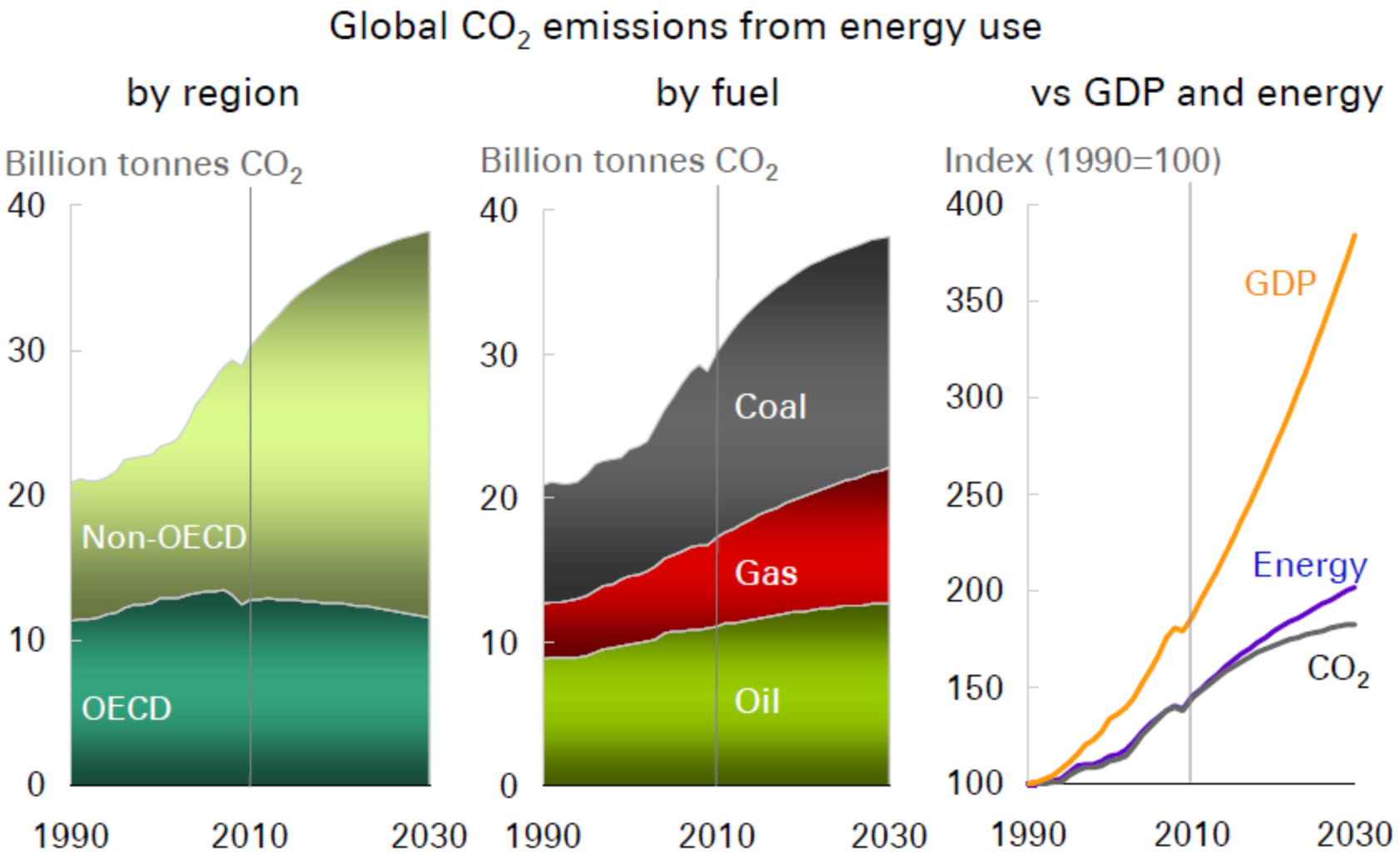
Projections to 2050

Population:

	2009	2050	
Developed	1.35 B	1.55 B	(+0.20 B; 15%)
Developing A	3.45 B	4.50 B	(+1.05 B; 30%)
Developing B	1.90 B	2.87 B	(+0.97 B; 51%)
World Total	6.70 B	8.92 B	(+2.22 B; 33%)

Source: United Nations

BP Energy Outlook 2011: Projection w/o Strong Global Agreement



Courtesy of BP. Used with permission.

Task 1

- ***Each bloc will set its own fossil fuel emissions targets***
  - You will set:
    - What year will emissions in your bloc stop growing (if any)?
    - (If desired), at what rate will emissions fall? (as a % per year)
    - Starting in what year?

- ***Developing A and B will set future deforestation***
  - On a scale of 0 to 1, the current level is 1.
  - Choose 1 to continue BAU deforestation path, 0 to gradually eliminate deforestation over coming decades, or somewhere in the middle.

Task 2

- We are going beyond Durban & creating the “UN Global Fund for Mitigation & Adaptation” for
  - Disaster relief
  - Food and water
  - Immigration and refugees
  - Mitigation — Investing in any necessary non-cost-saving mitigation to achieve Task 1 goals
- Total cost is $100 Billion/ year for next 10 years
- What is your proposal for the fraction of the annual cost each Group should pay? Why?

Proposal Form

- **World _____ / Region: _____**
- **CO_2 Emissions growth stop year: _____**
- **CO_2 Emissions decline start year: _____**
- **Fractional rate of decline (%/year): _____**
- **Your region's contribution to fund for mitigation and adaptation ($B/year): _____**

[Developing A and B only]

- **REDD (Reduction in Emissions from Deforestation and land Degradation) (1 = no cut from BAU; 0 = max cut): _____**

Your proposals

	Stop year	Reduce year	Annual fractional reduction	Future deforestation	Contribution to Fund ($Billion/yr)
Developed	2100	-	-	X	-
Developing A	2100	-	-	1	-
Developing B	2100	-	-	1	-
(Example)	*2073*	*2086*	*2%/year*	*.4*	*$10 Billion*

After you prepare your region's proposal

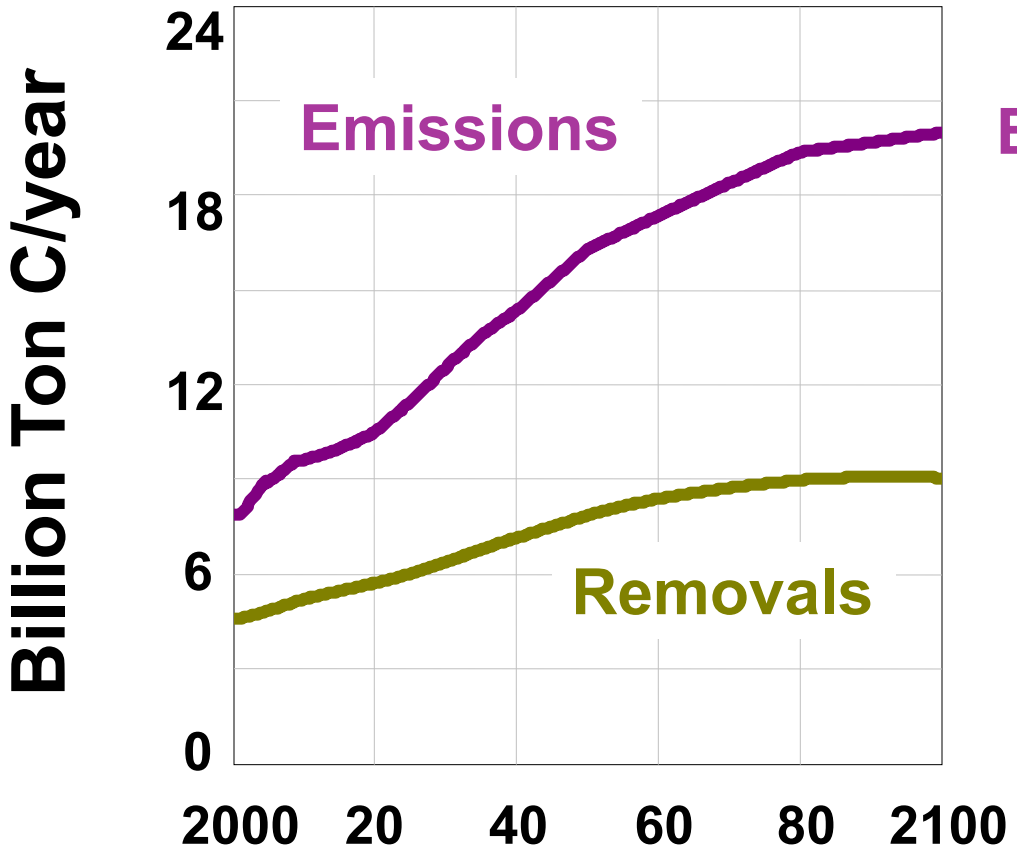
2-minute plenary presentation by each Bloc about their emissions proposal, their Fund commitment and why.

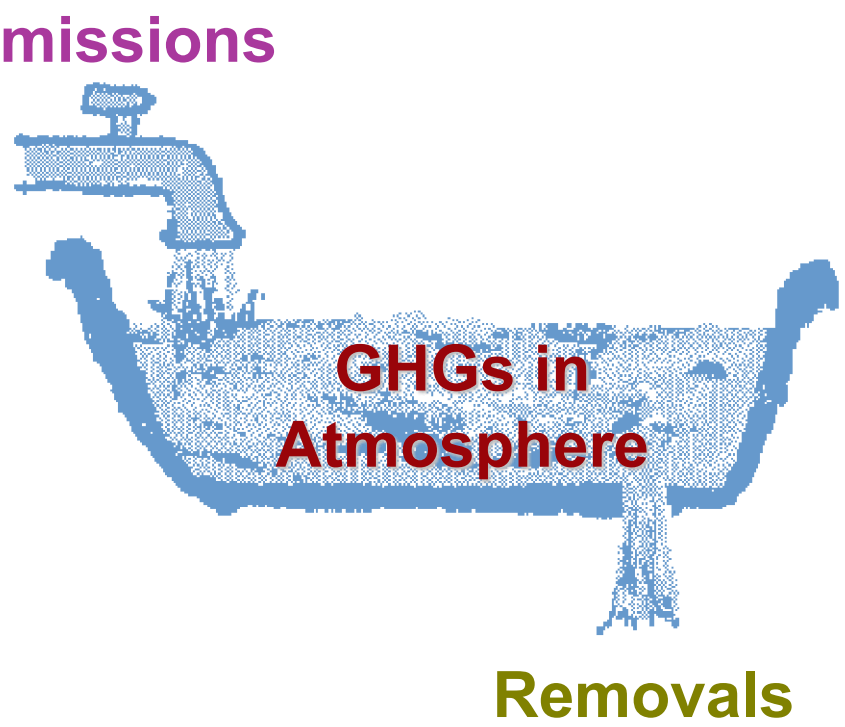
Designate a representative to give your Bloc's speech.

Round 1

Debrief Round 1

GHG Emissions Under Current Proposals Continue to Exceed Removal from Atmosphere





Round 2

Debrief Round 2

Round 3

Debrief Round 3

Round 3

Overall Debrief

How can the world do this?

This is (mainly) NOT a technical question!!

& Nobody knows the answer!

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15.031J / 14.43J / 21A.341J / 11.161J Energy Decisions, Markets, and Policies
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