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# A Post-Kyoto Framework for Climate Change

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# A Post-Kyoto Framework for Climate Change

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Daniel Bodansky

George Washington University

September 2, 2008

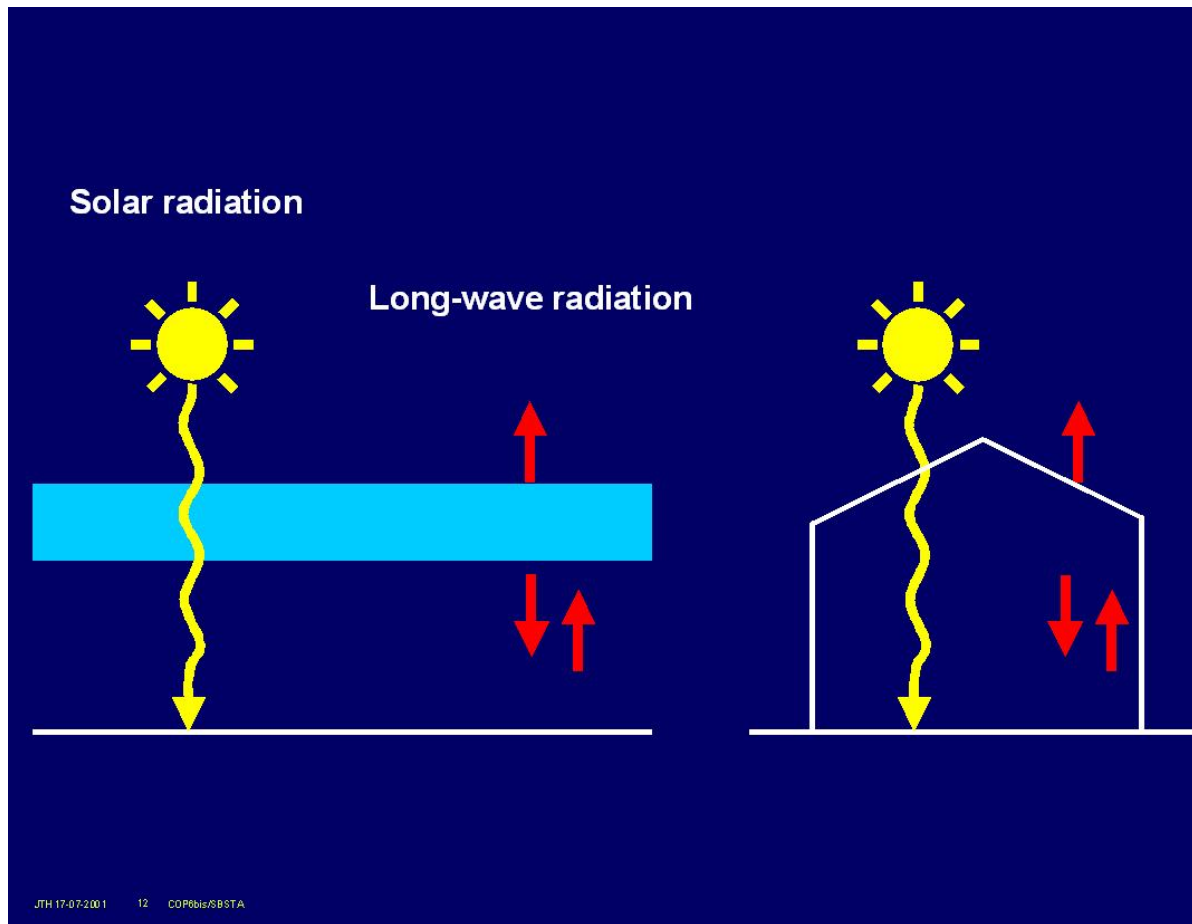


# My Talk Today

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- State of the science
- History of the international climate regime
- Bali Action Plan negotiations: current issues
- A Post-Kyoto framework

# Greenhouse Effect



Svante Arrhenius  
(1859-1927)

## The main greenhouse gases

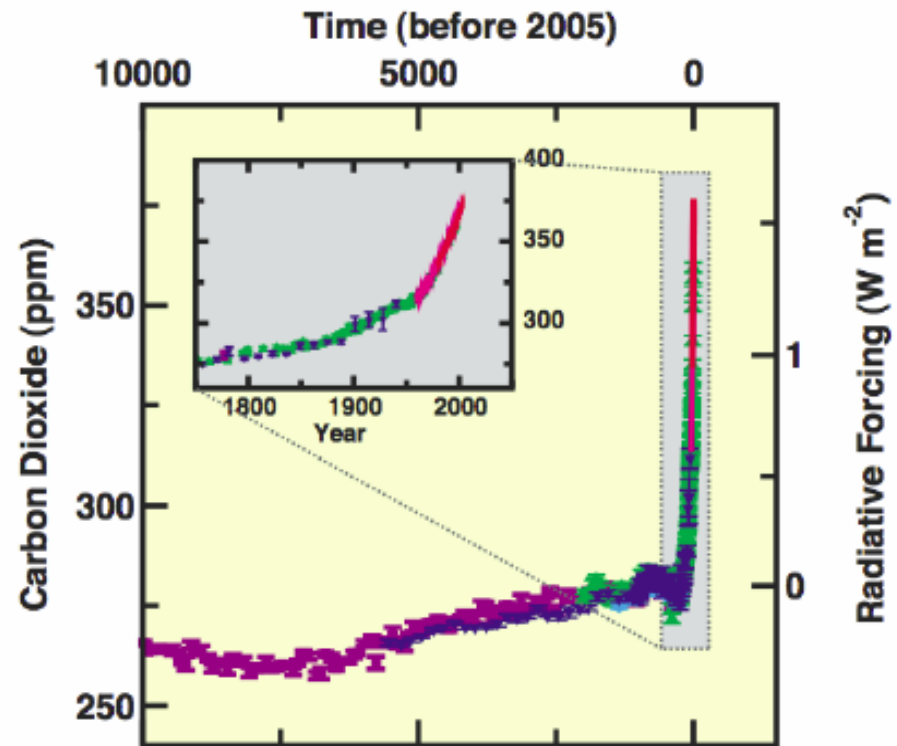
Name	Pre-industrial concentration (ppmv *)	Concentration in 1998 (ppmv)	Atmospheric lifetime (years)	Main human activity source	GWP **
Water vapour	1 to 3	1 to 3	a few days	-	-
Carbon dioxide (CO <sub>2</sub> )	280	365	variable	fossil fuels, cement production, land use change	1
Methane (CH <sub>4</sub> )	0,7	1,75	12	fossil fuels, rice paddies waste dumps, livestock	23
Nitrous oxide (N <sub>2</sub> O)	0,27	0,31	114	fertilizers, combustion industrial processes	296
HFC 23 (CHF <sub>3</sub> )	0	0,000014	260	electronics, refrigerants	12 000
HFC 134 a (CF <sub>3</sub> CH <sub>2</sub> F)	0	0,0000075	13,8	refrigerants	1 300
HFC 152 a (CH <sub>3</sub> CHF <sub>2</sub> )	0	0,0000005	1,4	industrial processes	120
Perfluoromethane (CF <sub>4</sub> )	0,00004	0,00008	> 50 000	aluminium production	5 700
Perfluoroethane (C <sub>2</sub> F <sub>6</sub> )	0	0,000003	10 000	aluminium production	11 900
Sulphur hexafluoride (SF <sub>6</sub> )	0	0,0000042	3 200	dielectric fluid	22 200

\* ppmv = parts per million by volume, \*\* GWP = Global warming potential (for 100 year time horizon).

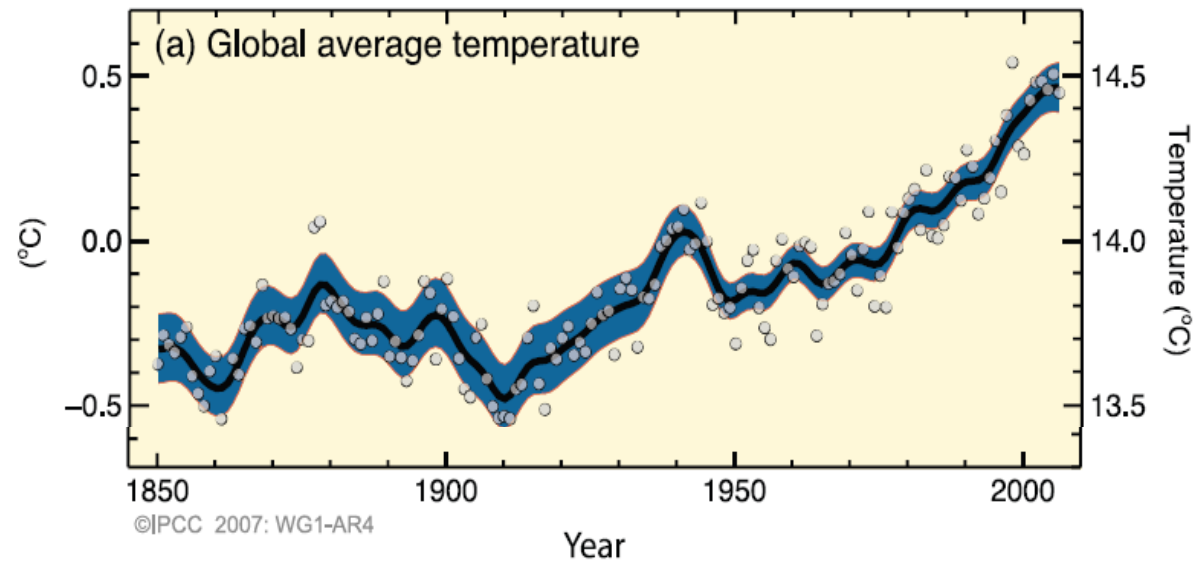
# GHG Concentrations Increasing

- Atmospheric concentrations of CO<sub>2</sub> have increased from 280 ppm in pre-industrial times to 387 ppm in 2007, the highest in 650,000 years

Changes in Greenhouse Gases from ice-Core and Modern Data



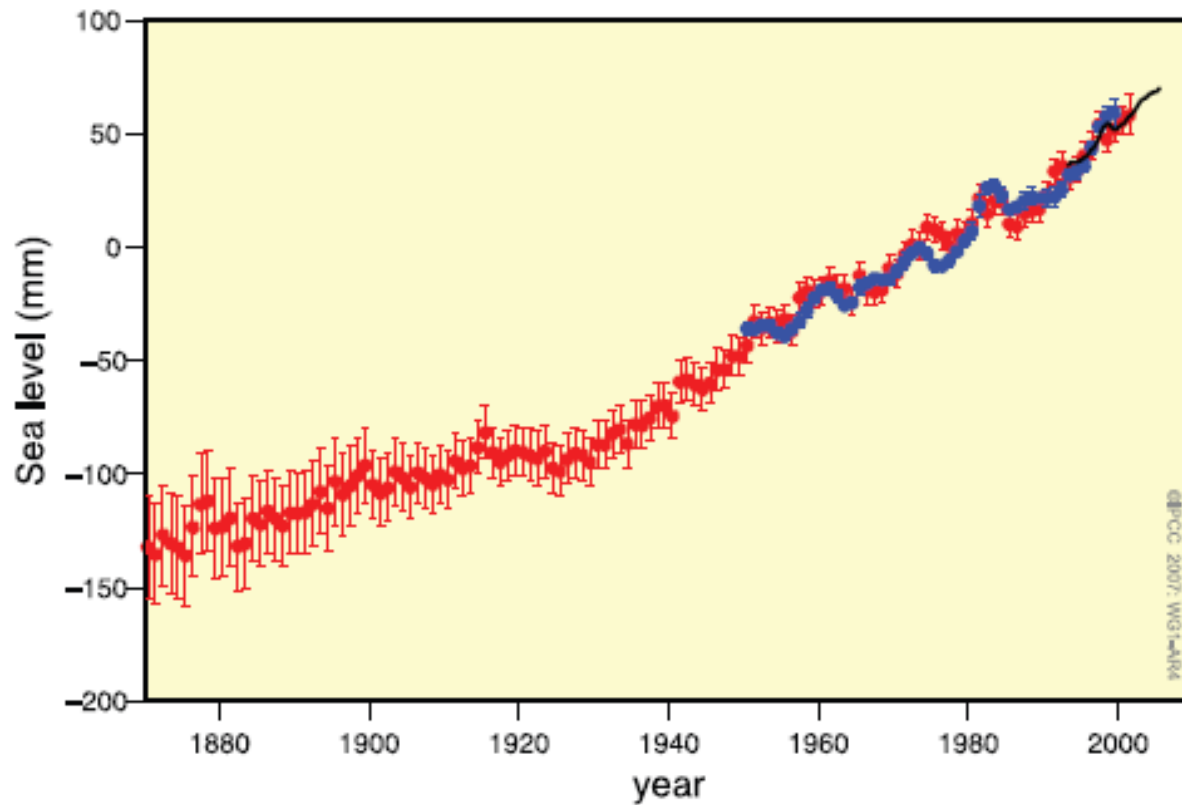
# The Earth Is Warming



- IPCC 2007
  - “Warming of the climate system is unequivocal”
    - Eleven of the last twelve years (1995–2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850)
  - “Most of the observed increase in globally averaged temperature since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations.”

# Sea Levels Are Rising

GLOBAL MEAN SEA LEVEL





# Glaciers Are Retreating

Posterze Glacier, Austria 1987-2004



Grinnell Glacier, Glacier National Park,  
1910-1997





# Snows of Kilimanjaro Disappearing

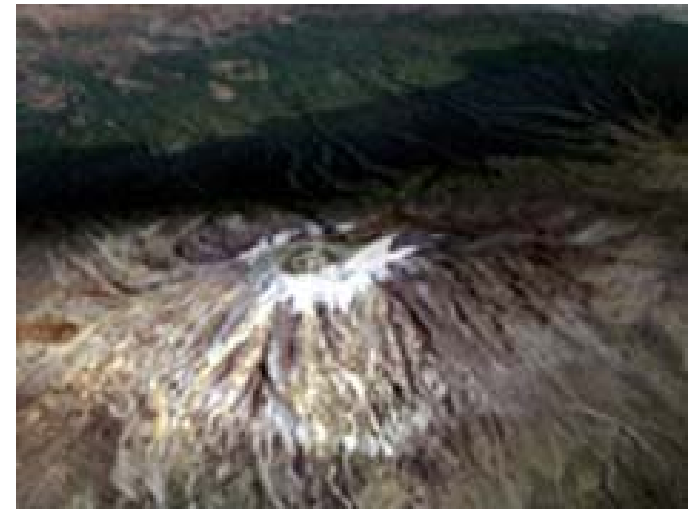
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- Ice cover on Mt. Kilimanjaro decreased by 81% between 1912 and 2000.

February 1993



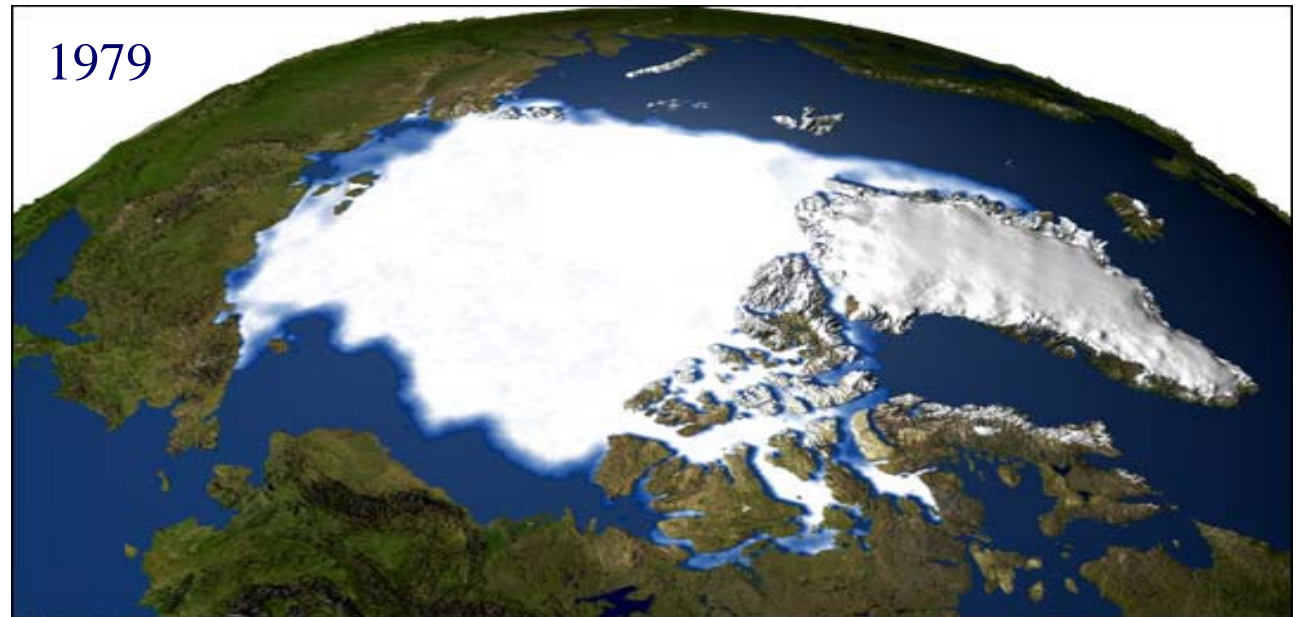
February 2000



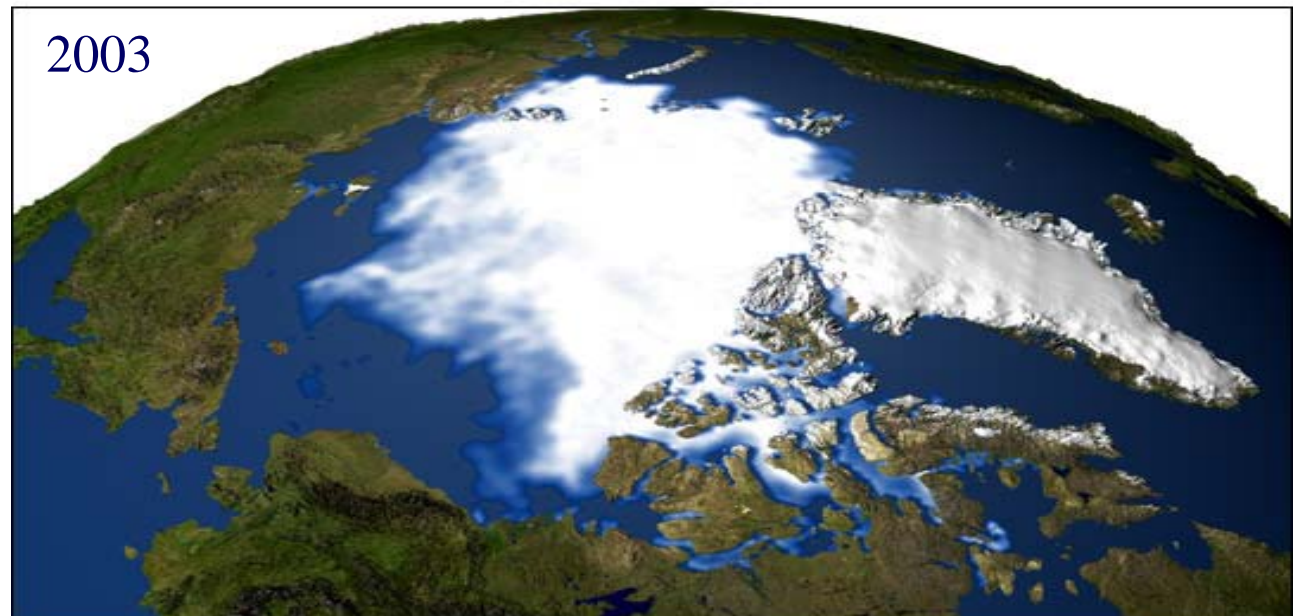


# Arctic Sea Ice Is Thinning

According to NASA study, Arctic sea ice has been decreasing at a rate of 9% per decade since 1970s



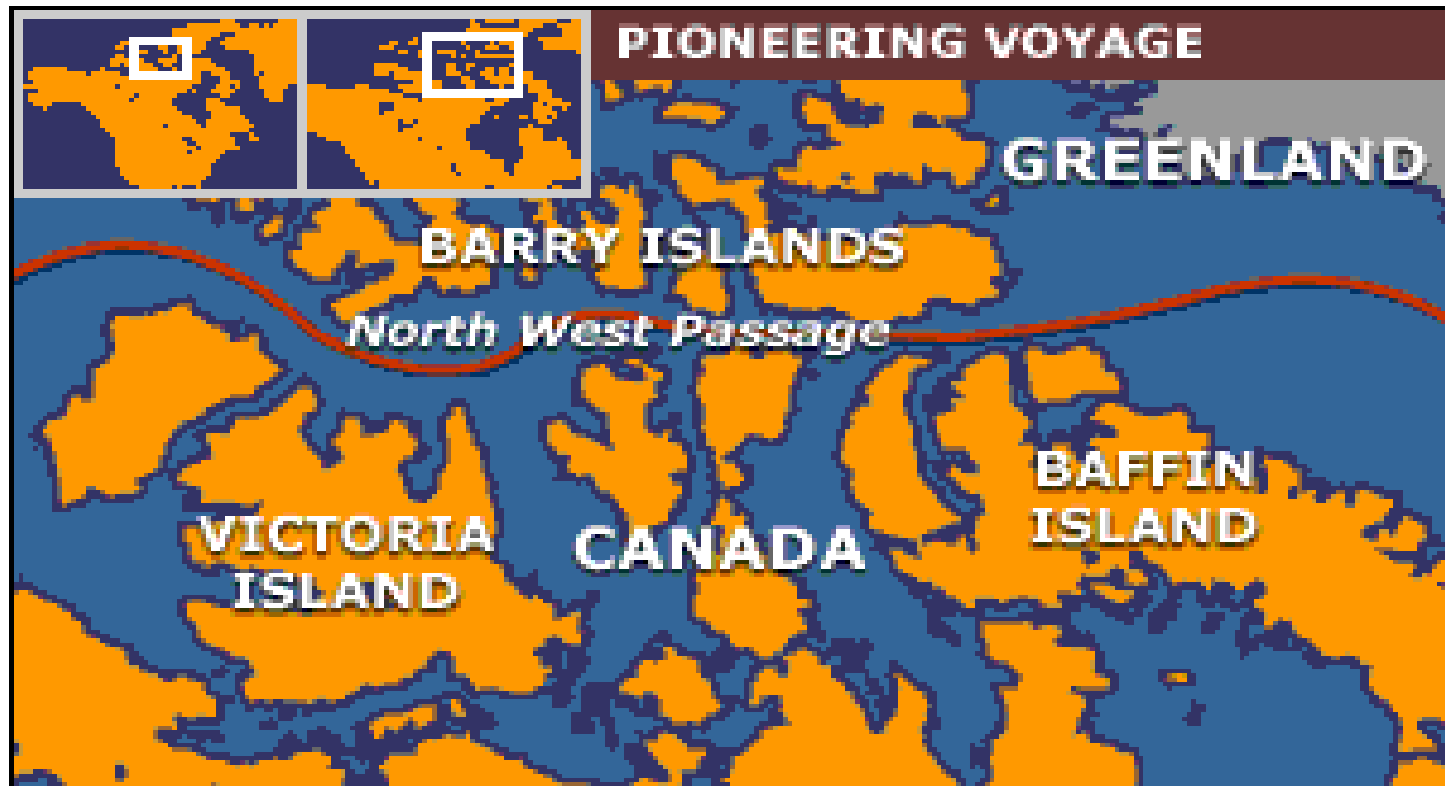
1979 SSMI Composite Data

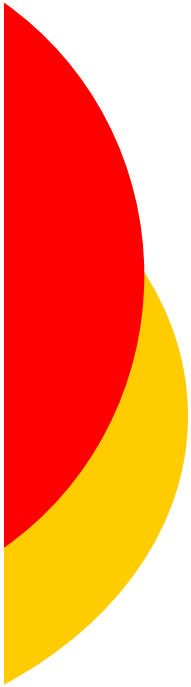


2003 SSMI Composite Data

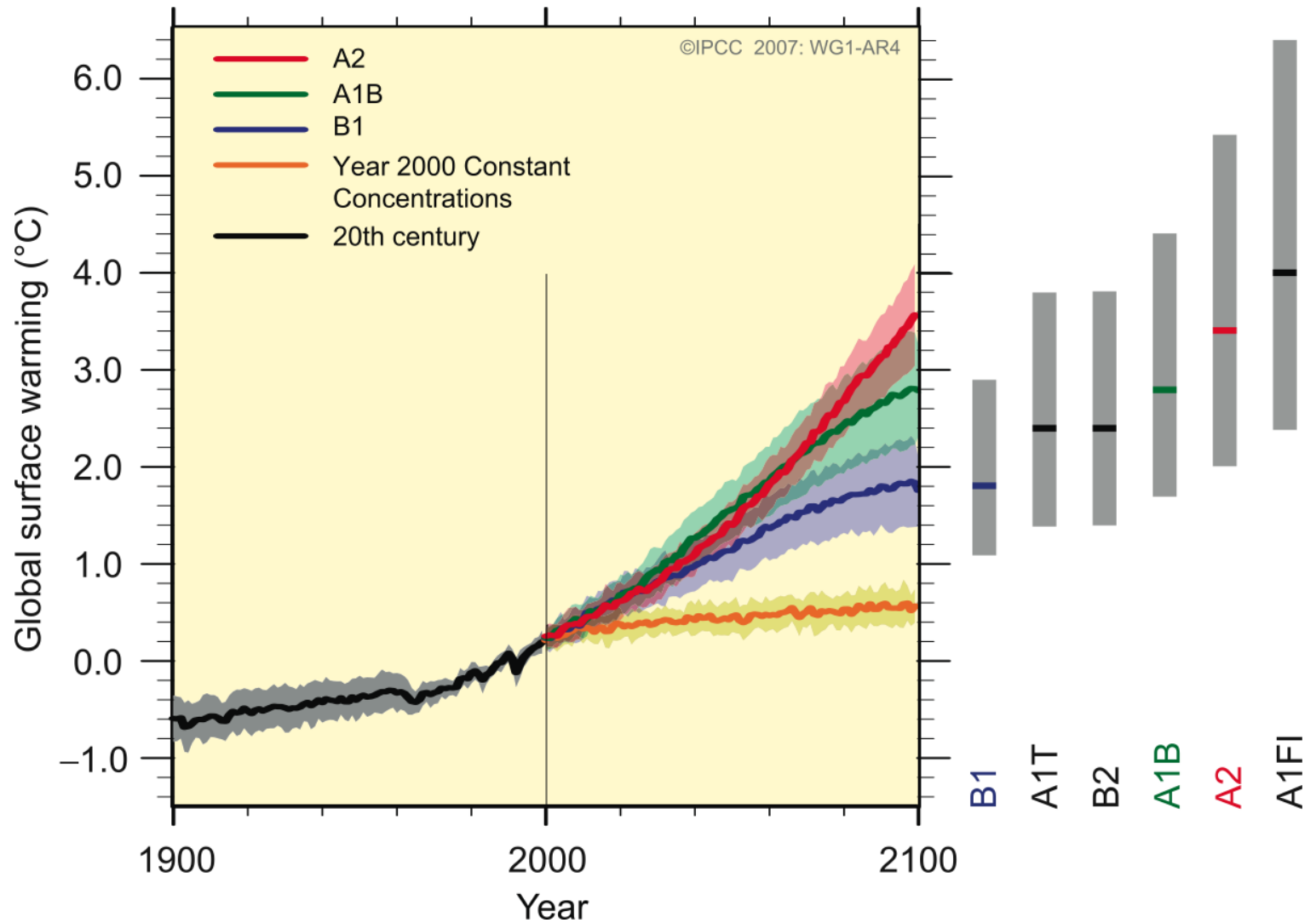
# The Northwest Passage Is Opening

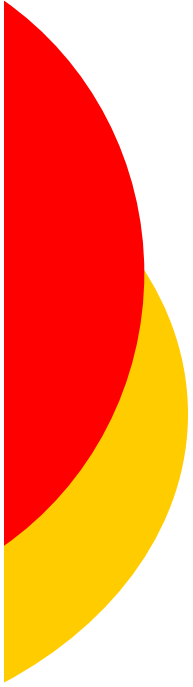
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# ... And the Future Looks Even Warmer





# Likely Impacts of Global Warming

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- Extreme weather events more intense
- Increased droughts and floods
- Coastal flooding and erosion
- Corals harmed by
  - Warmer temperatures > coral bleaching
  - Acidification > shell dissolution)
- Increased malnutrition, deaths due to heat waves, floods, storms

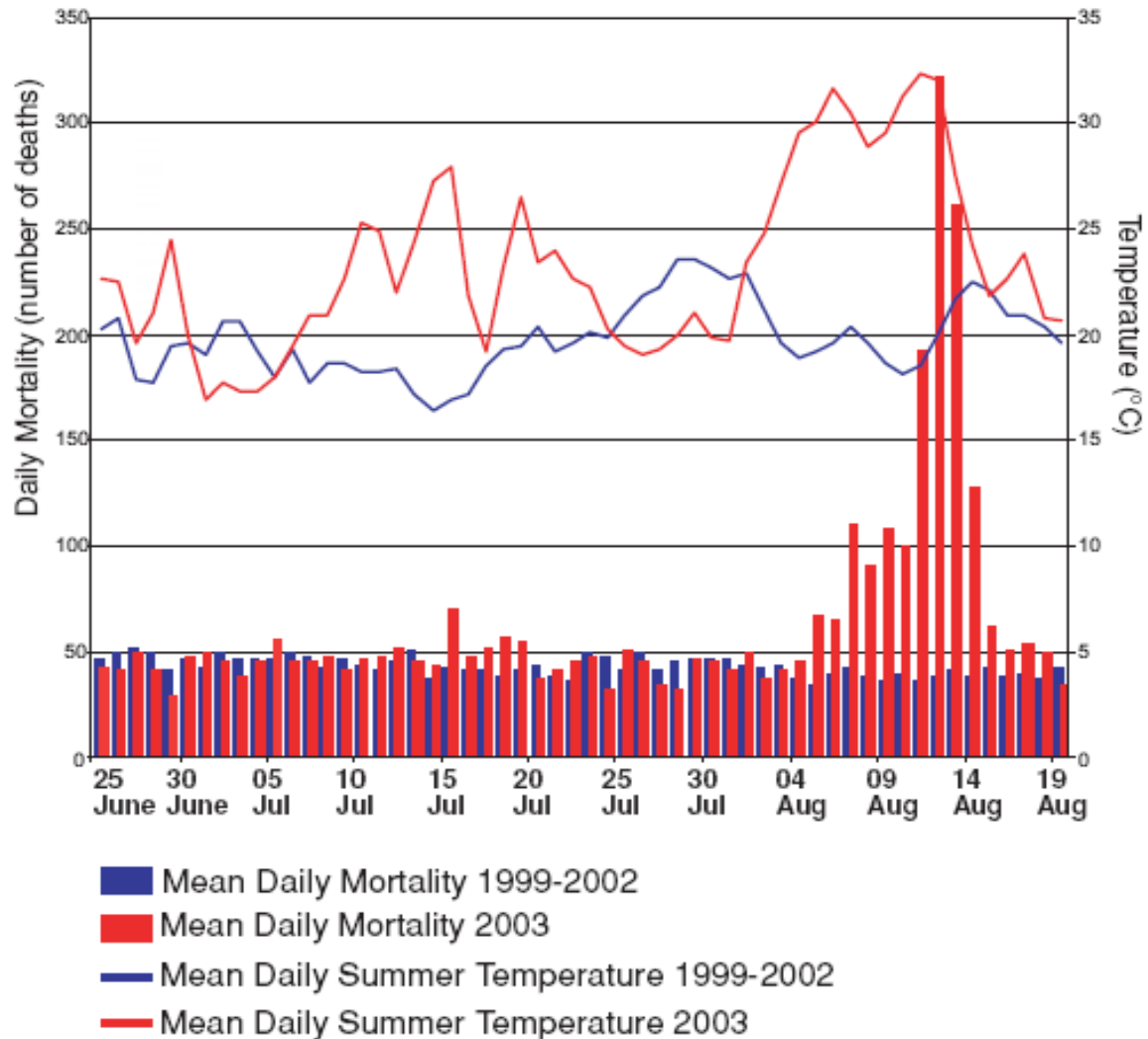


# Some Regions Impacted More than Others....

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- Africa “one of the most vulnerable continents”
  - 75-200 million people exposed to water stress by 2020
  - Agricultural production “severely compromised”
- Small islands: erosion, storm surges
- Asian mega-deltas: Risk of flooding
- Poor communities especially vulnerable due to limited adaptive capacity

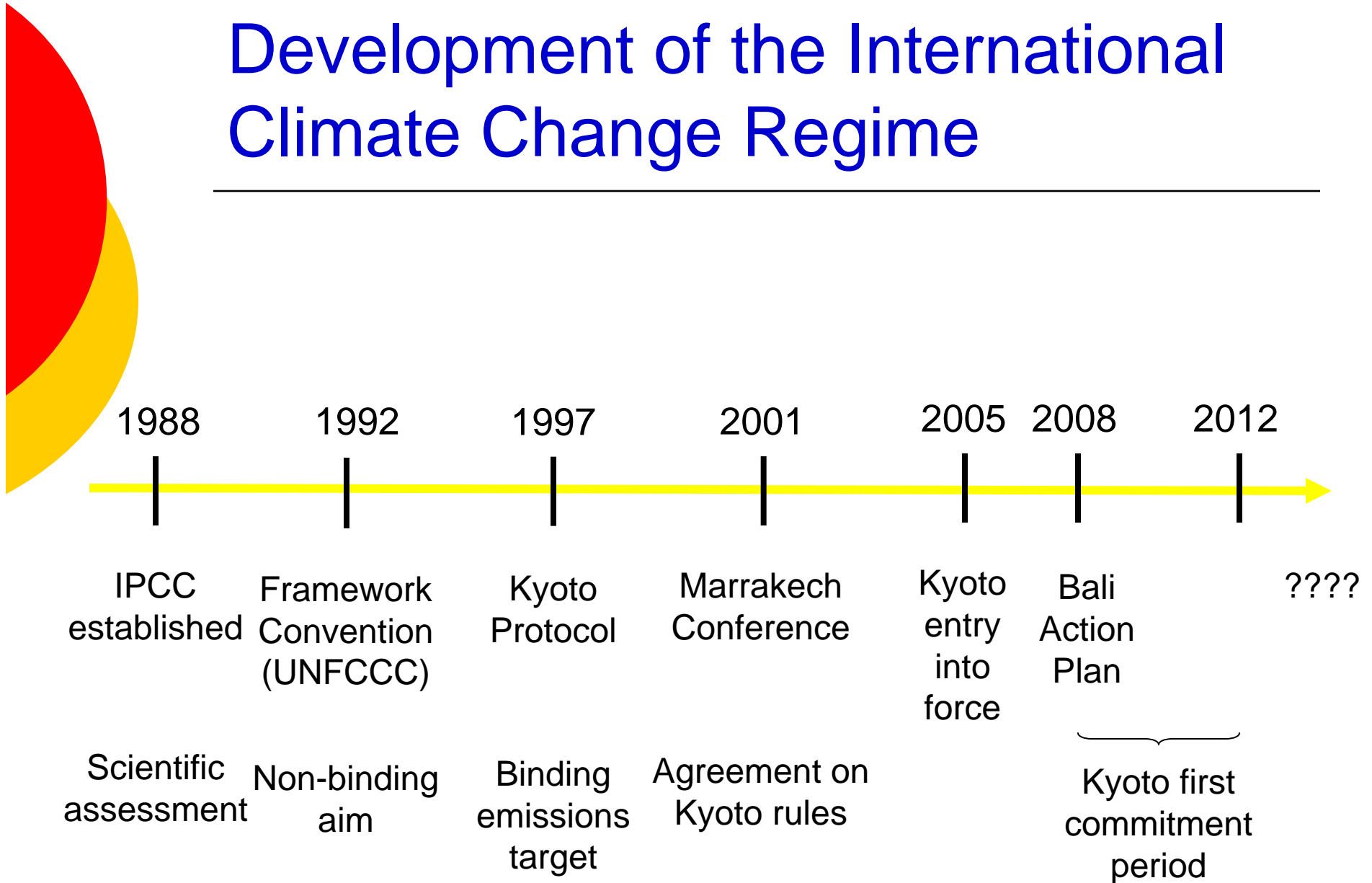
# ... But Even Rich Societies Vulnerable





# Development of the International Climate Change Regime

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# Negotiating Constants

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## Major Blocs

- EU
- US
- G-77

## Basic positions

- Binding emission reduction targets
- Concern about economic costs
- Maximum flexibility
  - Domestic choice of policies and measures
  - Market mechanisms (emissions trading)
- Developing country participation
- No emission targets for developing countries
- Financial and technological assistance



# Framework Convention/Protocol Approach

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- Framework Convention/Protocol approach allows states to proceed incrementally
- Framework Convention adopted in 1992
  - Establishes general system of governance, but no binding targets
- Kyoto Protocol, 1997
  - Binding emission targets for developed countries: fixed reductions from 1990 baseline for 2008-2012 period



# Developed/Developing Country Differentiation in the Climate Regime

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- Principle of common but differentiated responsibilities and respective capabilities: potentially flexible
- But UNFCCC established static list
  - Annex I countries: developed countries
    - Non-binding emissions aim
    - Extra reporting requirements
  - Non-annex I countries: developing countries
- Berlin Mandate/Kyoto Protocol
  - Expressly excluded new commitments for developing countries
  - Developing countries can't even voluntarily accept commitments



## Where Are We Now?

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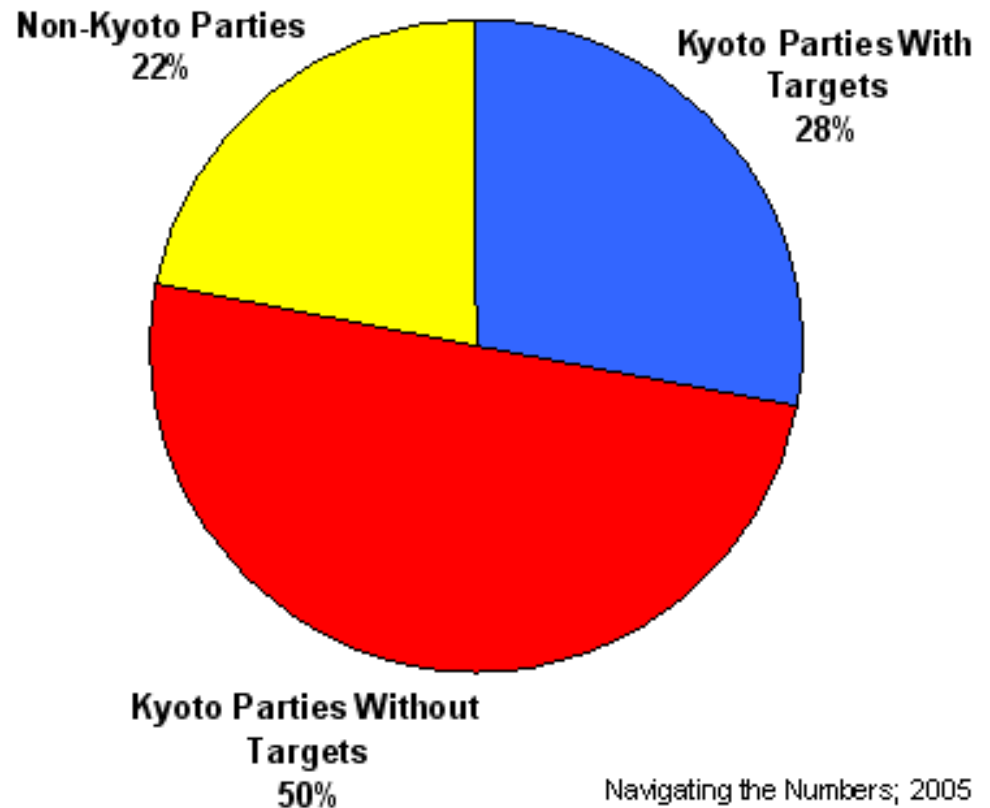
- Kyoto Protocol came into force in 2005
- Development of carbon market
- US initiatives:
  - Asia-Pacific Partnership
    - Focus on technologies
  - Major Economies Meetings (MEP)
    - 15 countries representing 80% of global emissions/GDP/population

## But ....

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- Kyoto targets cover only about 1/4 of global emissions
- Kyoto first commitment period ends in 2012

Global GHG Emissions (Year 2000 Data)



Navigating the Numbers; 2005  
World Resources Institute  
Year 2000 GHG data

# Where are we heading?

## Negotiations on Post-2012 Regime

- What to do after 2012, when KP first commitment period ends?
  - How to develop a fair and effective framework that delivers significant effort from all major economies?
  - 2004 Pew Center on Global Climate Change study identified 40+ proposals
  - Probably > 2x that number today
- General options
  - Continuation of Kyoto: negotiate second commitment period targets
  - New agreement under UNFCCC
  - New agreement(s) outside UNFCCC

ADVANCING THE INTERNATIONAL EFFORT AGAINST CLIMATE CHANGE

### INTERNATIONAL CLIMATE EFFORTS BEYOND 2012: A SURVEY OF APPROACHES

by  
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UNIVERSITY OF GEORGIA  
SCHOOL OF LAW  
with contributions from  
Sophie Chou  
Christie Jorge-Tresolini  
PEW CENTER ON GLOBAL  
CLIMATE CHANGE



# Bali Action Plan

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- Recognizes that “deep cuts in global emissions will be required”
- Launches a “comprehensive process”
- Tentative end date of 2009








## Key Issue: How much parallelism between developed and developing countries?

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- Berlin Mandate/Kyoto Protocol
  - Categorical exclusion of any new commitments for developing countries
- Bali Action Plan options
  - Berlin Mandate language: total exclusion of developing countries
  - Same language for both
  - Separate paragraphs for developed and developing



# Why Does Parallelism Matter?

## Getting the Senate On Board

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- Biden-Lugar resolution passed by Senate Foreign Relations Committee

States “objective of securing United States participation in *binding agreements that...establish mitigation commitments by all countries that are major emitters of greenhouse gases*, consistent with the principle of common but differentiated responsibilities”

- Lieberman-Warner bill passed by Senate Environment and Public Works Committee

“It is the policy of the United States to work proactively under the United Nations Framework Convention on Climate Change and in other appropriate forums to establish *binding agreements committing all major greenhouse gas-emitting nations* to contribute equitably to the reduction of global greenhouse gas emissions.”



# Parallelism in the Bali Action Plan

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- Comprehensive process to consider, inter alia:
  - *Developed countries*
    - “measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives”
  - *Developing countries:*
    - “national appropriate mitigation actions ... in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner”
- Issues
  - “actions” vs. “commitments”
  - measurable, reportable and verifiable (MRV)



## Assessment of Bali

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- Procedural rather than substantive
- But an important step forward
  - Bush Administration: agreed to launch negotiations, including on commitments
  - Developing countries: signaled willingness to consider additional actions



# Current Negotiating Processes

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- Two working groups
  - Ad Hoc Working Group on Long-Term Cooperation Action (AWG-LCA) – Bali Action Plan
  - Ad Hoc Working Group on Further Commitments under the Kyoto Protocol (AWG-KP)
- Meetings thus far
  - Bangkok, April 2008
  - Bonn, June 2008
  - Accra, August 2008
- Next COP in Poznan this December.
- 4 more meetings of AWG next year, leading to Copenhagen in December 2009



# Why Is Issue So Hard?

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- Prevailing perspective: climate change a collective action problem
  - States are unitary actors, rational utility maximizers
  - Each state has an individual incentive to pollute
  - But if each state pollutes, leaves everyone worse off
- Cooperative outcome leaves everyone better off, but difficult to organize and enforce

		Country Y	
		Abate	Pollute
Country X	Abate	+1 +1	+2 -2
	Pollute	+2 -2	-1 -1



## Why Is Issue So Hard?

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... But is this the right way to conceptualize the problem??

- On climate change, many of key players don't want to do much
  - US (until recently), India, China?
- At present, not primarily a collective action problem
  - ... Instead, problem of domestic politics – lack of political will



# Current Obstacles I

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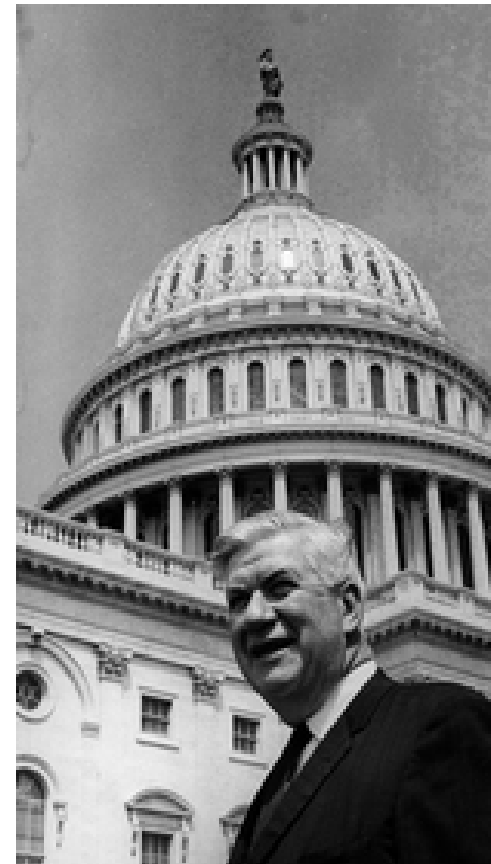
- Limited political will in key countries
  - Long-term problem
  - Science still uncertain, not too specific
  - Dependence on fossil fuels > cost of shifting
  - Countries have different costs/vulnerabilities > different interests
- Kyoto architecture
  - Kyoto allows only a single emission type: fixed, absolute emission targets, tied to historical emissions



# Lessons from Kyoto: Top-down vs. Bottom-Up

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- Kyoto's approach top-down
  - Start with international agreement.
  - This will put pressure on states to act
  
- But all politics are local
  - Domestic usually drives international, rather than vice versa
  
- > Bottom-up approach:  
International action should grow out of, rather than precede, domestic action





# Current Obstacles II

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- Limited political will in key countries
  - Long-term problem
  - Science still uncertain, not too specific
  - Dependence on fossil fuels > cost of shifting
  - Countries have different costs/vulnerabilities > different interests
- Kyoto architecture
  - Kyoto allows only a single emission type: fixed, absolute emission targets, tied to historical emissions



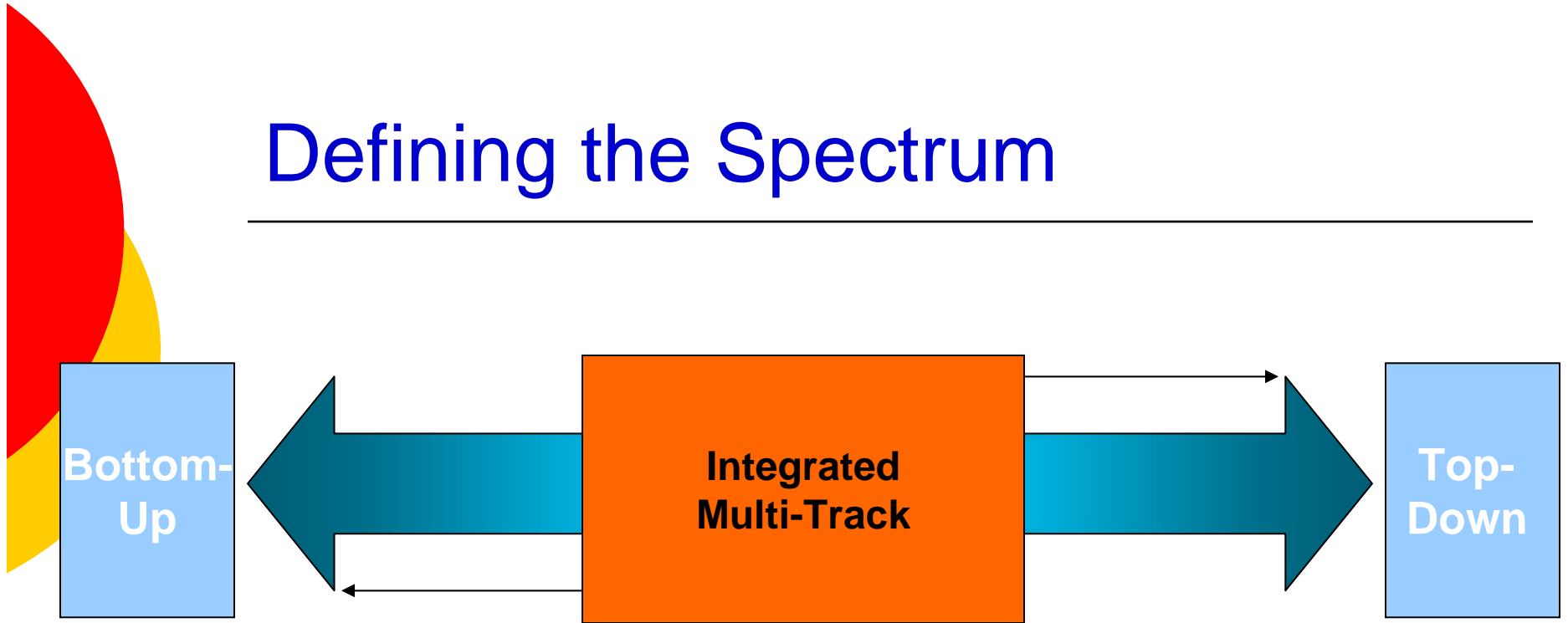
# Rationale for Integrated Multi-Track Framework

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- Addresses second obstacle
  - Assumes a minimum level of political will
  - Provides a more flexible architecture, which might be acceptable to broader range of states

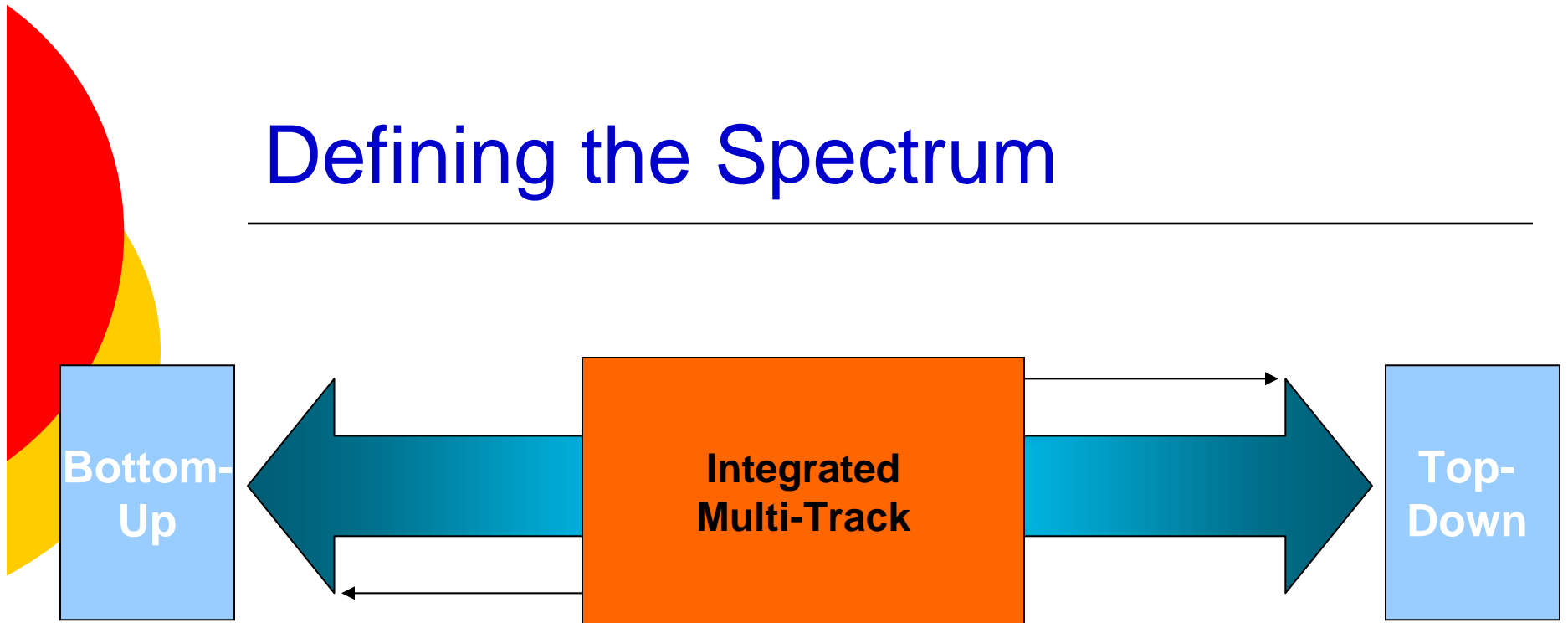
# Defining the Spectrum

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# Defining the Spectrum

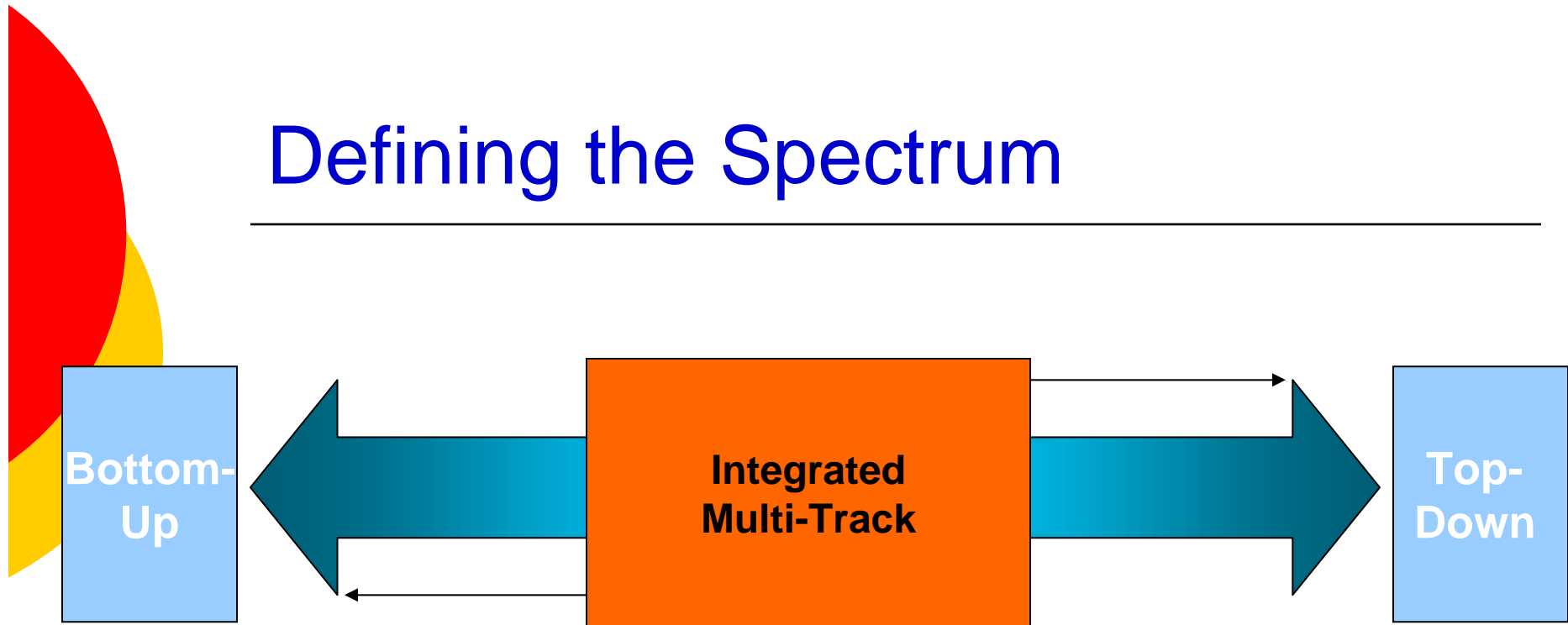
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Binding international commitments shape and drive national policies  
Examples: Kyoto, global cap-and-trade

# Defining the Spectrum

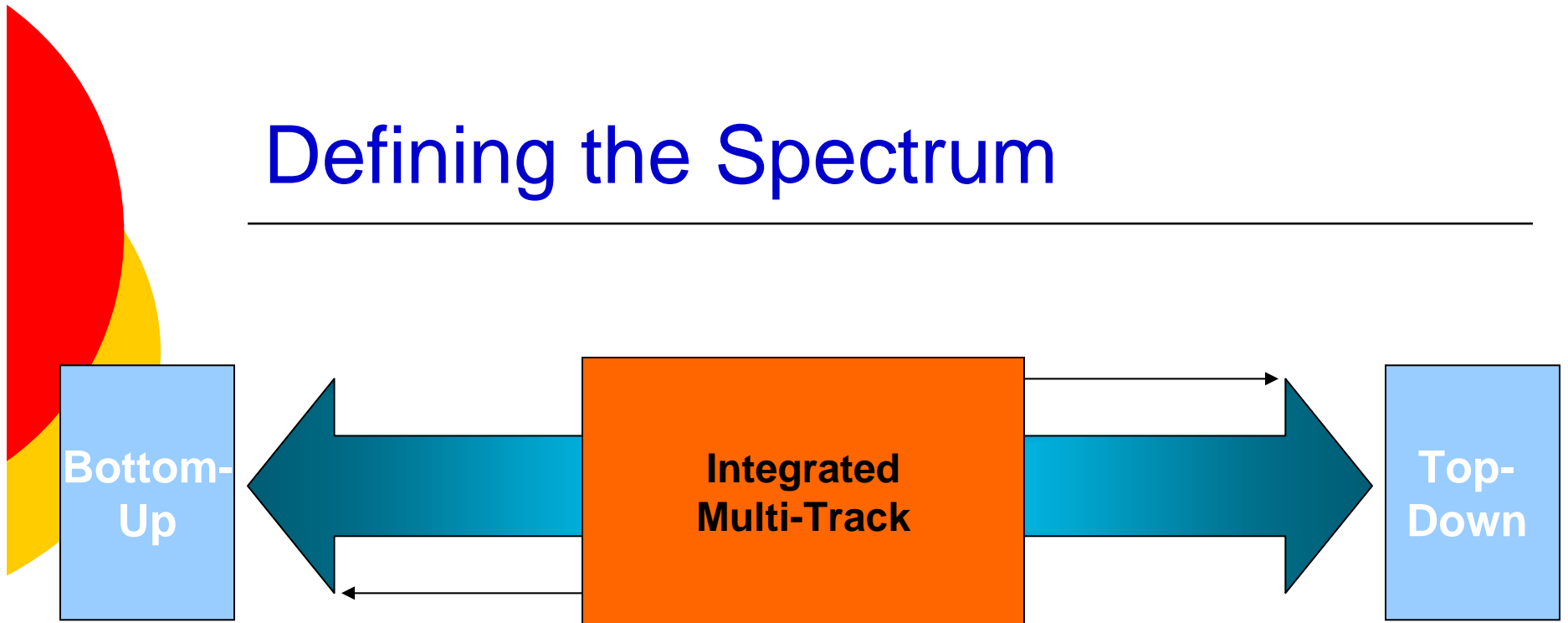
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Aggregation of nationally defined programs offered on a voluntary basis  
Example: Bush vision of aspirational long-term target plus national programs

# Defining the Spectrum

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Introduce bottom-up flexibility while retaining cohesion and reciprocity of top-down



# What Is a Multi-Track Framework?

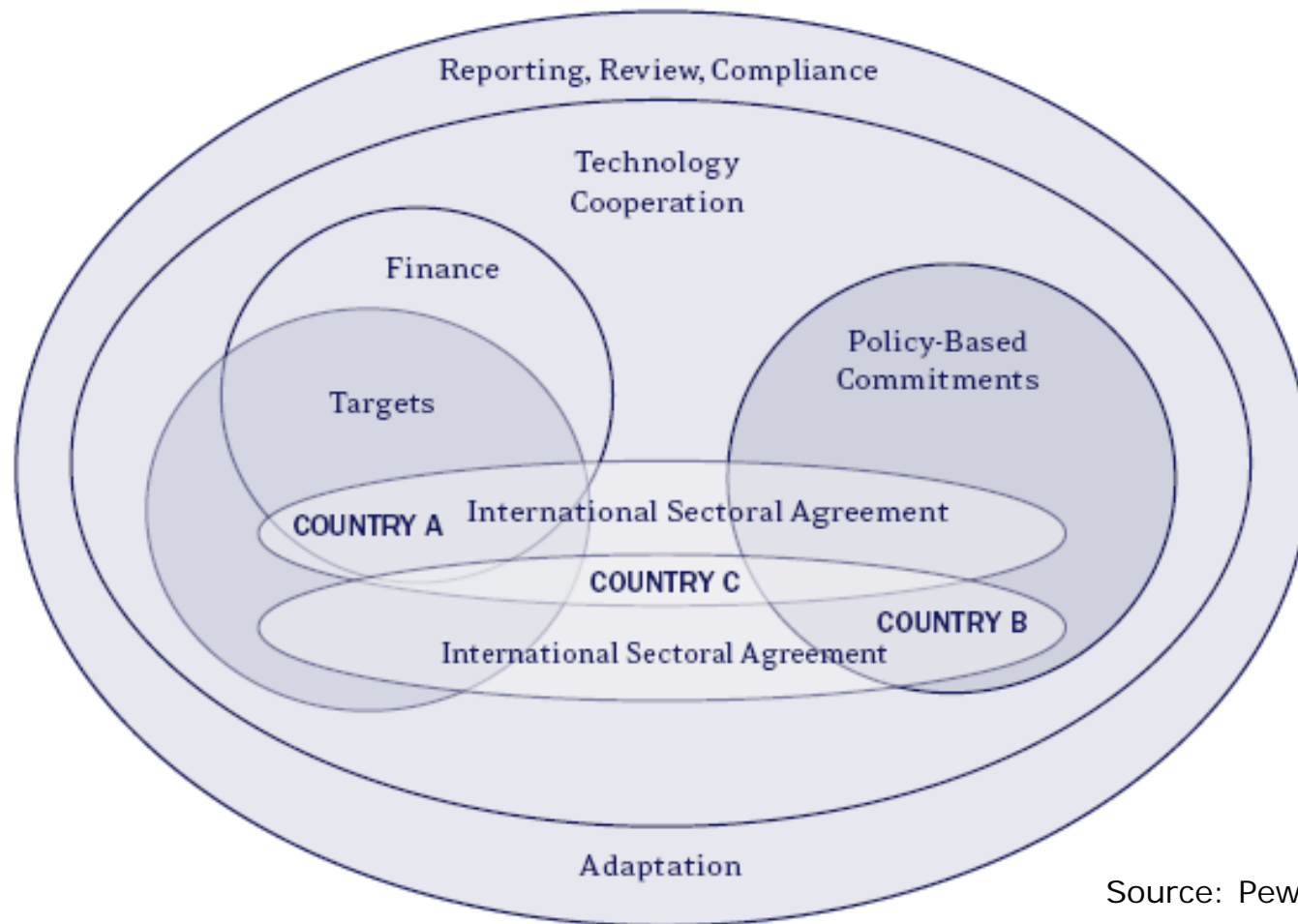
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- Variable geometry
  - Different groupings of countries with different types of commitments – e.g.
    - Targets and timetables: absolute, indexed
    - International sectoral agreements
    - Policy measures
    - Technology cooperation
    - Finance
    - Adaptation
    - Sectoral
- But different tracks linked



# An illustration

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Source: Pew Center



# Why Flexibility?

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- States have different economic and social circumstances
    - Resource endowment, economic structure, fuel mix, mitigation potential, climate, etc.
  - States have different levels of responsibility and capacity
  - States have different regulatory traditions and capacities
- > Same types of actions don't make sense for all countries



# Why Integration?

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- Greater economic efficiency
  - Emissions trading, offsets
- Greater coordination
  - Common institutions, reporting/review, etc.
- Greater balance, reciprocity > stronger effort
  - A country's effort will be stronger if it is confident that its counterparts/competitors will reciprocate
  - Requires accountability at the international level, best achieved through some form of commitment
  - To achieve a critical mass of effort, need equitable commitments by all major economies, agreed as a package



# Analogies/Precedents for a Multi-Track Framework

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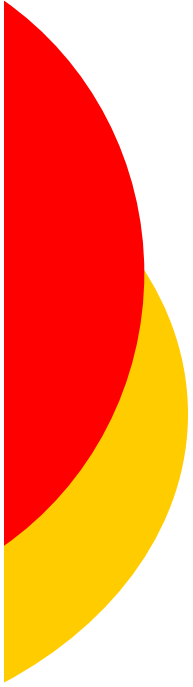
- Examples/precedents
  - European Union
  - Marshall Plan
  - GATT Tokyo Round Codes of Conduct
  - MARPOL annexes on vessel-source pollution



# Lessons from Other ‘Multi-Track’ Regimes

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- Importance of striking right balance between flexibility and integration
  - Too flexible > too little effort
  - Too integrated > limited participation
- Over time, many regimes evolve from high variability to greater consistency, integration
  - Trade: from “à la carte” GATT to single-package WTO
  - Law of Sea: from parallel agreements to comprehensive Convention
- In case of climate, scale and urgency of challenge require greater integration from the start



## Three illustrations

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- Illustration 1: Individualized commitments
- Illustration 2: Parallel agreements
- Illustration 3: Integrated agreement



# Illustration 1: Individualized Commitments

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## ○ Description

- Countries propose their own individualized commitments: “offers”
- Countries adjust their offers based on offers by others
- When agreement reached, memorialized in schedule of individualized national commitments
- Common rules on reporting, review, compliance



# Illustration 1: Individualized Commitments

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## ○ Pros

- Maximum flexibility
- Countries grow out of national policy approaches

## ○ Cons

- Negotiating individualized commitments very complex
  - Difficult to compare effort
- Unlikely to produce high level of effort
  - Countries likely to offer only no-regrets measures





## Illustration 2: Parallel Agreements

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- Description:


- Countries negotiate an agreement with annexes on different commitment tracks (targets, sectoral policies, technology cooperation, adaptation, finance)
  - Annexes could be elaborated at one time or sequentially
- Countries can pick and choose which annexes to join



## Illustration 2: Parallel Agreements

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- Pros
  - Regime develops incrementally
  - Countries able to pick and choose based on national circumstances and level of political will: don't need universal agreement
- Cons
  - Precludes linkages/reciprocity across different tracks
  - Countries likely to accept only those annexes that don't require them to make significant changes
  - More appropriate for discrete issues, rather than for single, integrated problem




# Illustration 3: Integrated Agreement

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## ○ Description

- Countries agree at outset on limited number of tracks, and which countries would negotiate within each track
- Different from individualized commitments: defined tracks with bounded types of commitments
- Different from parallel agreements: package agreement would specify which countries would participate in which tracks > countries can't pick and choose



# Illustration 3: Integrated Agreement

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- Pros:
  - Facilitates linkages across different commitment types and countries > greater overall level of effort
- Cons
  - Very complicated to negotiate
  - Easier for small number of countries to block agreement



# Integration issues in context of Bali Roadmap

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- Bali Action Plan compatible with multi-track framework.
- Issues
  - What is verifiable?
  - How is comparability of effort assessed?
  - What incentives, assistance will be forthcoming?
  - What is the difference between “action” and “commitment”?
  - Can major economies agree on a balanced package of commitments and incentives?