

Climate Change and the Social Sciences and Humanities

It's all about being human.
It's all about economics.
It's all about politics.
It's all about global governance.

Responses to climate change are driven mostly by political, economic, and social considerations and motives, rather than scientific knowledge and advice based on that knowledge.

Climate change is not just a physical and life sciences issue: it is a political, economic, and social issue

World Energy Outlook 2011

“If we do not change direction soon, we will end up where we're heading.”

World Energy Outlook 2011

450 Scenario

- Avg. 2°C increase

New Policies Scenario

- Avg. 3.5°C increase

Current Policies Scenario

- Avg. 6°C increase

Climate change impacts on human society and nonhuman systems

World Energy Outlook 2011

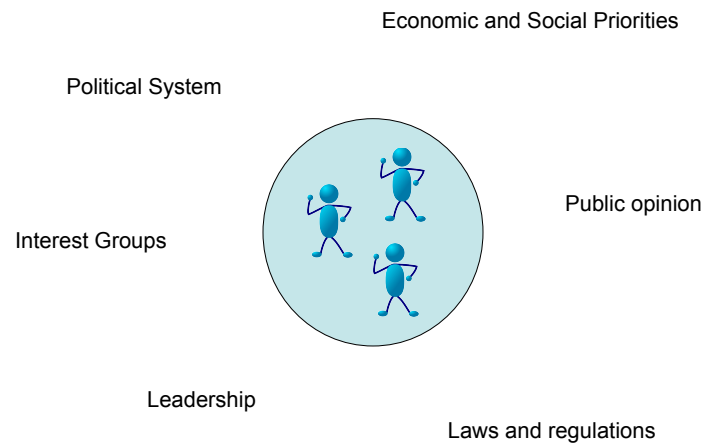
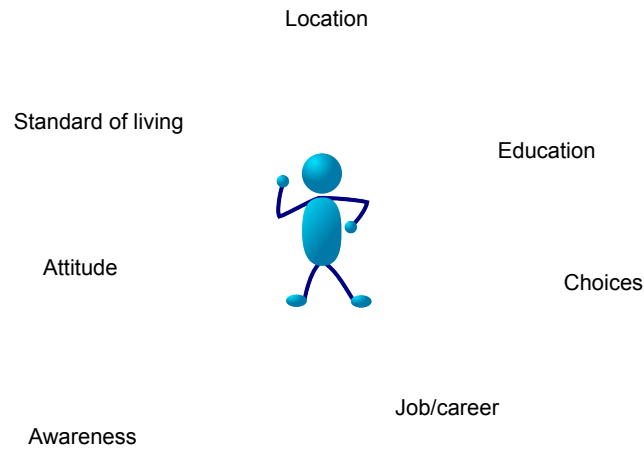
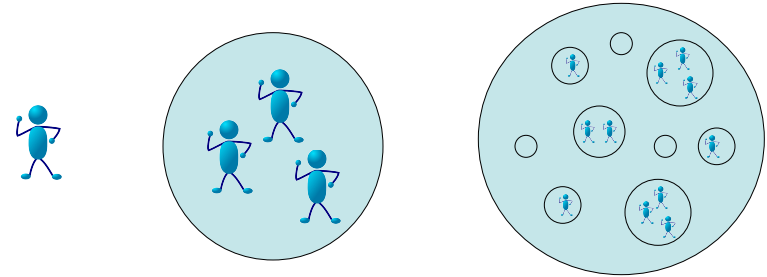
“The wide difference in outcomes between these three scenarios underlines the critical role of governments to define the objectives and implement the policies necessary to shape our energy future.”

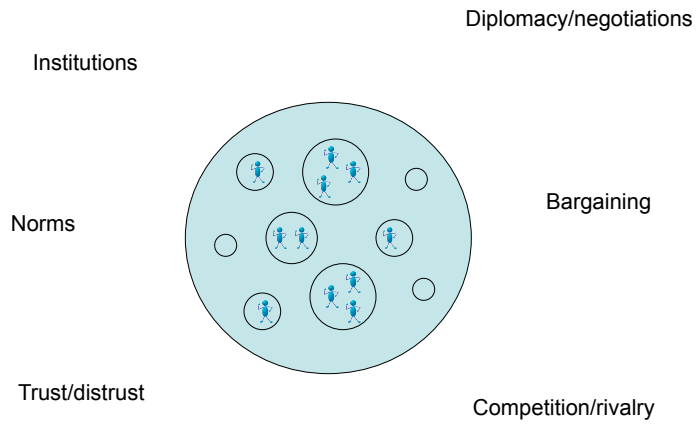
Climate Change and the Social Sciences and Humanities

It's all about being human...

1. Analytical and policy complexity

The Traditional Levels of Analysis: Individual, State/Group, and System





1. Analytical and policy complexity

“Climate change is the hardest political problem the world has ever had to deal with.”

-The Economist

2. The Generation Gap

How much are individuals and societies willing to do now for the sake of future generations?

2. The Generation Gap

2. The Generation Gap

The Precautionary Principle:

“When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.”

(Wingspread Statement 1998)

Uncertainty

“Most of the observed increase in global average temperatures since the mid-20th century is **very likely** due to the observed increase in anthropogenic greenhouse gas concentrations.”

IPCC AR4 Report

2. The Generation Gap

To refuse to act because of uncertainty is either to deny that climate change exists, or to argue that doing nothing is an appropriate response to uncertainty.

Uncertainty

“Very Likely” = 90 percent probability.

3. Not just another environmental problem...

3. Not just another environmental problem...

- Chemical pollution
- DDT (Dichloro-Diphenyl-Trichloroethane)

3. Not just another environmental problem...

3. Not just another environmental problem...

- Acid rain
- Sulphates

- Ozone Hole
- ChloroFluoro-Carbons (CFCs)

World Production of CFCs (Thanks to the Montreal Protocol...)

4. Ethics, Equity and Justice

- Unequal impacts
- Responsibility

Ethics, Equity and Justice

“I’ll tell you one thing I’m not going to do is I’m not going to let the United States carry the burden for cleaning up the world’s air, like the Kyoto treaty would have done. China and India were exempted from that Treaty. I think we need to be more even handed.”

–Former US President George W. Bush

(With 4 percent of the world’s population, the US emits 20% of all greenhouse gases).

4. Ethics, Equity and Justice

“The average rates at which people consume resources like oil and metals, and produce wastes like plastics and greenhouse gases, are about 32 times higher in North America, Western Europe, Japan and Australia than they are in the developing world.”

–Jared Diamond

5. Survival and Social Change

We are all going to die...

...under all of our stuff...

“...as the most fully realized consumer society in history, we’ve defined ourselves almost entirely as individuals, without any limits on what we should want. Any call to group action is dismissed as interfering with economic growth, with our personal quest for more.”

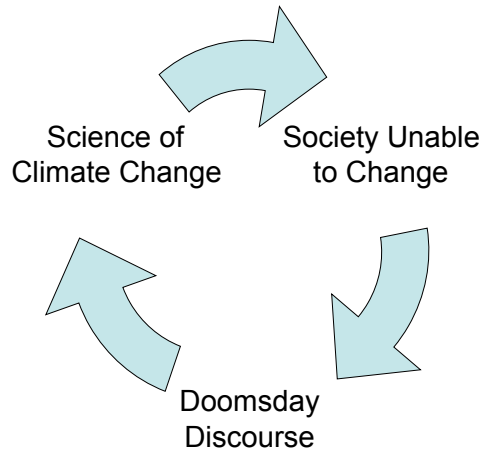
Bill Mckibben (writer)

...and we can’t help it.

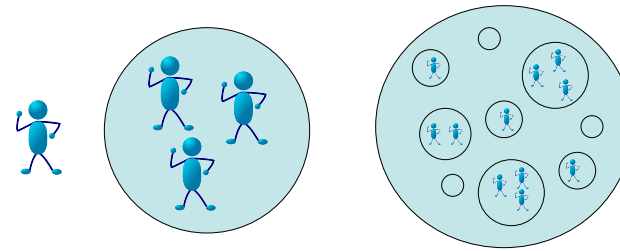
“Certain familiar sorts of motivation are not available to support policies demanding serious sacrifice for the sake of future generations, and we may well be discouraged by the further apparent fact that the cultivation of a form of motivation directly supportive of such policies might require something close to an overhaul of main elements in the makeup of society which influence the moral psychology of citizens.”

Norman Care (Philosopher)

Society and Prediction: *Zeitgeist*



We can think globally as individuals, but can we act globally as a collective?



It's all about being human...

Can human society meet the challenge of climate change?

The Group PBL Assignment

(Sign up in the hall now or at the break)

1. Sustainable Buildings
2. Biodiversity in B.C.
3. Promoting biking in Vancouver
4. Reducing Automobile Congestion
5. Waste Management
6. Adaptation and small B.C. farmers
7. Film production and energy consumption
8. A national cap and trade system?

Climate Change and Economics

...but economics struggles with climate change

Climate Change and the Social Sciences and Humanities

It's all about economics...

Climate Change and Economics

- **not particularly good** at weighing the welfare of the current generation against the welfare of future generations;
- **not good at all** when comparing the costs of climate change to rich peoples against the cost to poor peoples;
- **downright lousy** when it comes to measuring the costs associated with damage or loss of ecosystems, plant and animal species, etc.

Climate Change and Economics

- How we got here (according to economics)
 - The Tragedy of the Commons
 - The Public Good Dilemma
 - The Free Rider Problem

Climate Change and Economics

- “The Tragedy of the Commons”
 - Published by ecologist Garret Hardin in *Science* in 1968

The Tragedy of the Commons (according to economists)

Tragedy of the commons occurs when over exploitation of a limited-capacity resource due to unrestricted entry leads to its total collapse.

Climate Change and Economics

- The public good dilemma
 - public goods possess two qualities:
 - they are **nonexcludable**: they are goods that are readily available to everyone (even if all persons do not contribute to their creation or maintenance) and cannot be easily denied to others;
 - they are **nonrival**: use of the good by one actor does not seriously deplete the amount available to others

Climate Change and Economics

Public goods require management...
...or they erode.

Climate Change and Economics

Individuals or states over-exploit the planet's atmosphere because they gain material advantages from the activities that contribute to global warming but suffer only a fraction of the environmental costs. The incentive to manage the public good is therefore low.

Climate Change and Economics

Individuals and states are typically unwilling to reduce GHG emissions unilaterally because they would pay the full price of reducing their emissions, but gain only a fraction of the benefits and would make sacrifices that are likely futile if others free ride on their efforts.

Climate Change and Economics

- The "Free Rider" problem
 - "free riders" are those who consume more than their fair share of a public resource, or shoulder less than a fair share of the costs of its production.
 - Or: a non-paying user of non-excludable goods

Climate Change and Economics

- The economics (and politics) of emissions

Climate Change and Economics

- The economics (and politics) of energy conversion

Climate Change and Economics

- The economics (and politics) of energy conversion
 - The key issue in climate change economics is the cost of energy conversion away from fossil fuels

Climate Change and Economics

- The economics (and politics) of energy conversion
 - The key issue in climate change economics is the cost of energy conversion away from fossil fuels
 - This cost is usually calculated in terms of estimated impact on Gross Domestic Product (GDP), the value of all goods and services produced in a country in one year

Climate Change and Economics

- The economics (and politics) of energy conversion (using GDP)
 - Cost estimates ranges from slight increase in GDP to 5 percent of GDP per year
 - Largest study by Nicholas Stern gave cost of 1% of global GDP per year to 2050 to convert (later revised to 2% of global GDP)
 - Estimated costs of doing nothing range from 5% to 20% of current GDP

Climate Change and Economics

- Comparing the costs of energy alternatives... (or when economists start having fun)

Energy Source Comparisons

| Source of energy | Estimated Cost | Advantages | Disadvantages (hidden costs) |
|--------------------------|-----------------------------------|---|---|
| Coal | 4.8 cents per kilowatt-hour | <ul style="list-style-type: none"> •Inexpensive •Deposits Widely distributed •Transportable | <ul style="list-style-type: none"> •Emits 1.9 pounds (.86 kg) of CO2 per kilowatt hour |
| Coal with Carbon Capture | 6.5 – 7.7 cents per kilowatt-hour | <ul style="list-style-type: none"> •Effective way to capture CO2 (90%) •New Technologies could lower capture costs per ton of CO2 from \$40 to \$24 | <ul style="list-style-type: none"> •Technologies not developed •Storage of captured CO2 •Captured CO2 sometimes used for enhanced oil recovery |

Energy Source Comparisons

| | | | |
|---------|-------------------------------|---|---|
| Nuclear | 39.6 cents per kilowatt-hour | <ul style="list-style-type: none"> •No CO2 emissions •Improved safety •Produce electricity and hydrogen for fuel | <ul style="list-style-type: none"> •Nuclear waste •Nuclear proliferation •Construction costs •Very modest projected increase in use •Public opposition |
| Wind | 4 – 6 cents per kilowatt hour | <ul style="list-style-type: none"> •No CO2 emissions •Fuel is free | <ul style="list-style-type: none"> •Strong winds not always close to major energy markets •Wind does not always blow during peak demand times |

Energy Source Comparisons

| | | | |
|-------------------|---|--|---|
| Solar | 12 – 14 cents per kilowatt-hour (solar thermal) 18-40 cents per kilowatt-hour (photovoltaic) | <ul style="list-style-type: none"> •Does not emit CO2 •Operational costs low •Output more predictable (weather forecasting) | <ul style="list-style-type: none"> •More expensive than coal with carbon capture |
| Biofuels | Ethanol from corn Currently sells at price of gasoline in US | <ul style="list-style-type: none"> •Lower CO2 emissions •Emerging technologies will lower cost •Sugar and cellulose options | <ul style="list-style-type: none"> •Demand has pushed up food prices •Production emits CO2 •Clearing of forests to grow biofuel will increase carbon in atmosphere |
| Energy efficiency | Large savings available at 4 cents per kilowatt-hour or less | <ul style="list-style-type: none"> •Lower emissions with little investment •No need for new infrastructure | <ul style="list-style-type: none"> •Current market provides no signal to consumers of overall cost •No strong incentives to increase energy efficiency |

Climate Change and Economics

- Possible Strategies:
 - **Carbon taxes** to increase costs of carbon emissions to create incentive for reduction in emissions
 - **Subsidies** to alternate energy sources (wind, solar)
 - **Regulations** requiring utilities to provide a certain portion of their electricity from renewable sources
 - **Innovation** incentives (research and development): tripling global investment in research and development for alternative energy would restore funding to 1970s levels
 - **Carbon Trading** create a “cap and trade” system and a market for carbon credits to encourage reductions

Climate Change and the Social Sciences and Humanities

It's all about domestic politics...

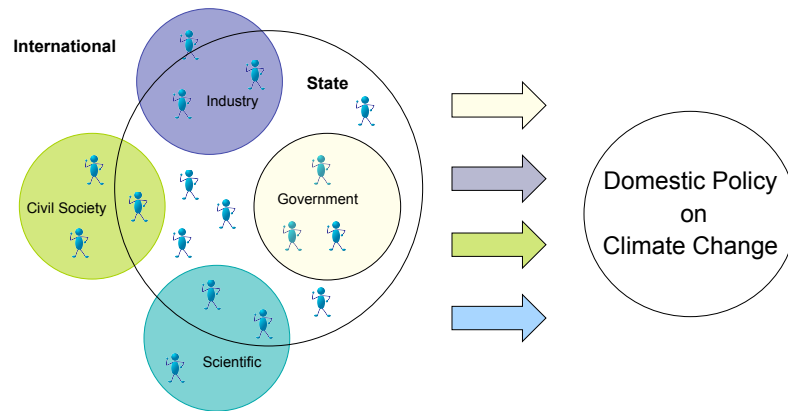
Climate Change and Economics

- Possible Strategies:
 - **And there is always consumption...**

Climate Change and Domestic Politics

- Where does domestic policy on climate change come from?

Influences and Determinants of Domestic Policy on Climate Change



Assumption:

The science of climate change is the same on both sides of the Canada-US border!

Climate Change and Domestic Politics

- Not the same across states...enter Comparative Politics!

Climate Change and Domestic Politics

- State Responses:
 - Tax
 - Regulate (Cap and Trade)
 - Legislate (laws)
 - Beg
- Assumes political will and public support

The State and Government

| | |
|-----------------|--|
| Japan | Top down Government maintains that economic growth and climate change mitigation are not exclusive |
| The Netherlands | Collaborative Government works with civil society actors and industry to forge national consensus |
| The US | Combative Government opposition to climate change science and policy initiatives |

From an internal memo by Republican pollster Frank Luntz

- “The environment is probably the single issue on which the Republicans in general, and President Bush in particular, are most vulnerable.”
- “Be even more active in recruiting experts who are sympathetic to your view, and much more active in making them part of your message.”
- “Should the public come to believe that the scientific issues are settled, their views on global warming will change accordingly. Therefore, you need to continue to make the lack of scientific certainty a primary issue.”

The Market and Industry

| | |
|-----------------|---|
| Japan | Supportive Industry consulted and generally supportive of government position |
| The Netherlands | Resistant then acceptant Industry resistance changed to business opportunism in face of government position |
| The US | Opposed Industry mobilized to undercut public and government support for climate change mitigation |

The 2000 US National Assessment of Climate Change Impacts on the United States

- Based on the work of hundreds of scientists over ten years
- Report warned of serious climate change impacts on US
- Lawsuit mounted against its release by some members of Congress, charging it was unscientific and unethical
- Charges dropped, but report was never widely distributed, never reached public debate

Civil Society

| | |
|-----------------|--|
| Japan | Marginal impact Not major players, added voice in support of government |
| The Netherlands | Highly engaged Major participants in policy deliberations with government |
| The US | Polarization “debate” fueled by industry-funded civil society actors; no coordination or cooperation between environmental groups and government |

The Greening the Earth Society

- “...the science behind global warming is not uncertain, its just wrong...there has been no steady rise or steady decrease...the warming that did occur, occurred before 1950, before most of the carbon dioxide from industrialization was put into the air, so the warming had to be natural...”

Executive Director, Greening the Earth Society
 (Sponsored by the Western Fuels Association)

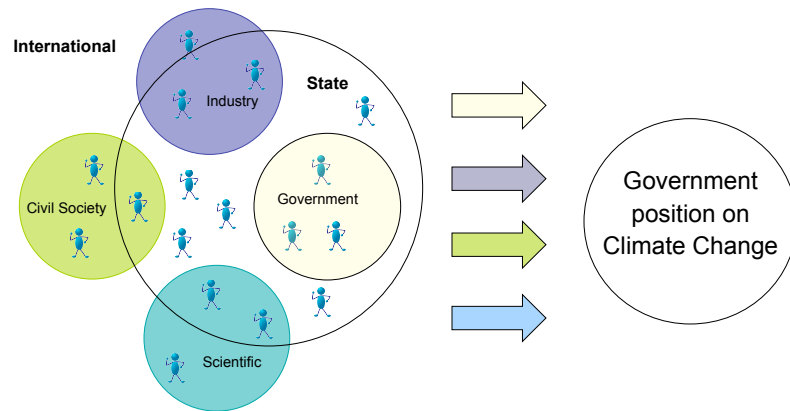
Science

| | |
|-----------------|---|
| Japan | Little challenge Widespread agreement with fundamentals of climate change science |
| The Netherlands | Little challenge Widespread agreement with fundamentals of climate change science |
| The US | Significant challenge Frequent attacks on climate change science |

- “With all of the hysteria, all of the fear, all of the phony science, could it be that man-made global warming is the greatest hoax ever perpetrated on the American people? It sure sounds like it.”

Senator James M. Inhofe July 28 2003

Influences and Determinants of Government Position on Climate Change

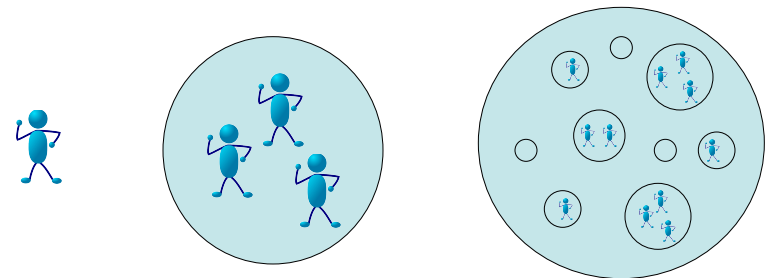


International (UNFCCC Framework)

| | |
|-----------------|--------------------------------------|
| Japan | Initially reluctant, then supportive |
| The Netherlands | Supportive |
| The US | Opposed |

Climate Change and the Social Sciences and Humanities

It's all about global governance...



Climate Change and Global Governance

- Obstacles to progress
 - The relative gains problem
 - Divergent interests
 - The compliance and enforcement problem
 - Domestic politics
 - The pace of events

Climate Change and Global Governance

- International Climate Change Responses
 - First World Climate Conference (1979)
 - Formation of IPCC (1988)
 - Second World Climate Conference (1990)

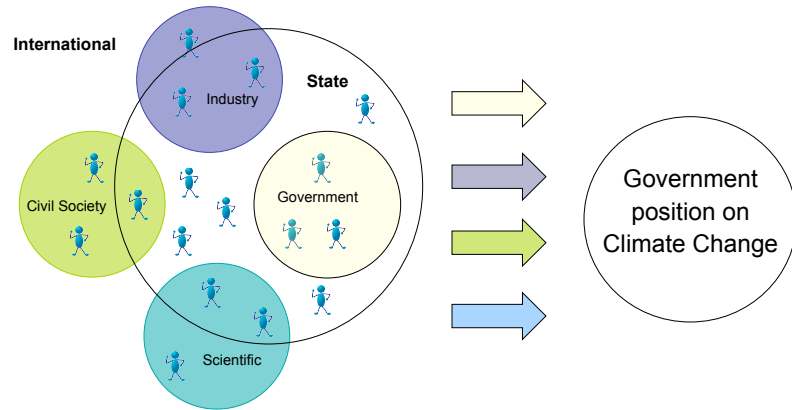
Climate Change and Global Governance

- International Climate Change Responses

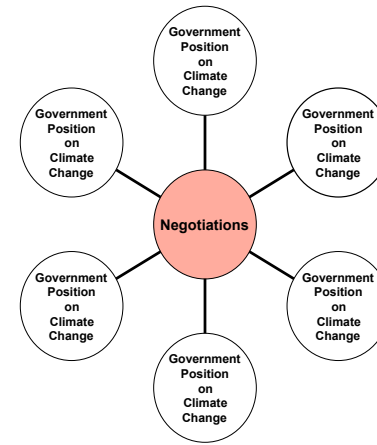
Climate Change and Global Governance

- Rio
 - Or: the United Nations Conference on the Environment and Development in Rio De Janeiro (1992)
 - Or: The Earth Summit
 - Signing of the UN Framework Convention on Climate Change (UNFCCC)

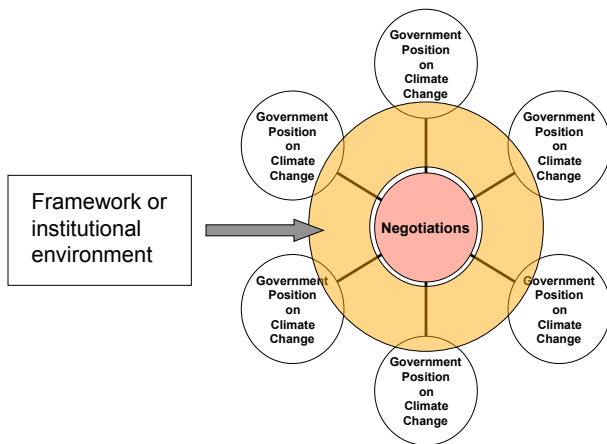
Influences and Determinants of Government Position on Climate Change



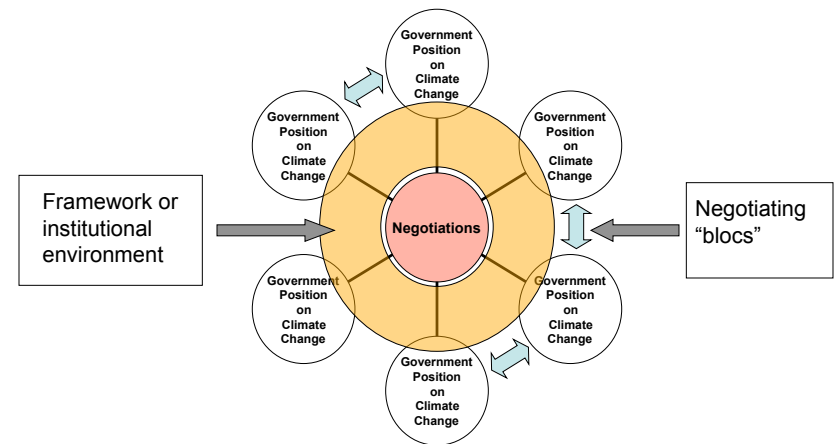
The Climate Change Negotiation Environment



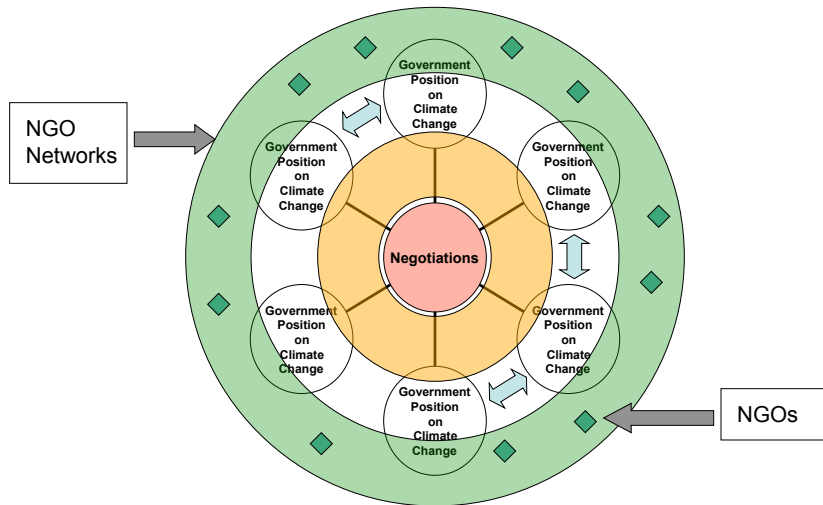
The Climate Change Negotiation Environment



The Climate Change Negotiation Environment



The Climate Change Negotiation Environment



Climate Change and Global Governance

- COP 3: Kyoto (1997)
 - Provisions

Climate Change and Global Governance

- UNFCCC (comes into force 1994)
 - provisions

The Byrd-Hagel Resolution (July 25, 1997) (passes US Senate 95-0)

“Whereas the exemption for Developing Country Parties is inconsistent with the need for global action on climate change and is environmentally flawed; and Whereas the Senate strongly believes that the proposals under negotiation...could result in serious harm to the United States economy, including significant job loss, trade disadvantages, increased energy and consumer costs, or any combination thereof...the United States should not be a signatory to any protocol...at negotiations in December 1997, or thereafter.”

Heading into Copenhagen

- Bali (COP 13) in 2007 set a goal to produce a legally binding global treaty to replace the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), which expires in 2012.

Heading into Copenhagen

- In 2008, carbon dioxide emissions were 30% higher per year than in 1992 when the UNFCCC was signed
- Emissions were 20% higher than in 1997, when Kyoto was signed.
- Atmospheric concentrations of CO2 equivalent GHG reached 430 parts per million in 2008, compared with 280 parts per million before the industrial revolution.
- A now widely accepted definition of dangerous climate change is a 2 degree C rise

Heading into Copenhagen

- The IPCC recommends that to have a good chance of avoiding dangerous climate change (a 2 degree increase) developed countries must cut their GHG emissions by at least 25 percent from 1990 levels by 2020, and global emissions must begin to decline by 2020 at the latest

Climate Change and Global Governance

- COP 15: Copenhagen (2009)
 - The negotiations
 - Split between develop and developing countries
 - Division into voting blocs

Negotiating Positions at Copenhagen, Cancun (2010), and Durban (2011)

| | | | |
|----------------|---|--|---|
| European Union | Cut emissions by 20% from 1990 levels by 2020 | Emissions reductions targets should be legally binding | Developing countries should reduce emissions |
| United States | Cut emissions by 17% below 2005 levels by 2020 (4% below 1990 levels) | Opposed to legally binding reductions targets | Developing countries must commit to binding emissions reductions Prepared to help raise \$100 billion global fund to help poor countries |

Negotiating Positions

| | | | |
|-------|---|--|---|
| Japan | Cut Emissions by 25% from 1990 levels by 2020 | | Rich countries should devote 1% of GDP to helping developing countries adapt to climate change |
| China | Cut CO2 emissions per unit of GDP (carbon intensity) by 40-45% below 2005 levels by 2020 Rich countries should cut emissions by 40% below 1990 level by 2020 | Opposed to legally binding reductions targets for developing countries Opposed to international verification of emissions | Developing countries must commit to emissions reductions Prepared to help raise \$100 billion global fund to help poor countries |

Negotiating Positions

| | | | |
|---------------|--|--|---|
| India | Cut emissions by 20 to 25% from 1990 levels by 2020 Rich countries should cut emissions by 40% below 1990 level by 2020 | Opposed to legally binding reductions targets for developing countries | |
| African Union | Rich countries should cut emissions by 40% below 1990 level by 2020 | Opposed to legally binding reductions targets for developing countries | Wanted a climate fund to reach \$100 billion by 2020 to help poor countries adapt to climate change |

Negotiating Positions

| | | | |
|---|--|---|---|
| Alliance of Small Island States (Aosis) | Limit temperature rise to 1.5% above pre-industrial level Lower CO2 levels to 350 parts per million Emissions should be cut by 85% below 1990 levels by 2050 | Rich country emissions reductions targets should be legally binding | Rich countries should devote 1% of GDP to helping developing countries adapt to climate change |
| Canada | Cut emissions by 20% below 2006 levels by 2020 | Called for a new global treaty to replace Kyoto | Developing countries must commit to binding emissions reductions No specific pledge of financial aid to developing world |

The Copenhagen Accord

- Unlike the UNFCCC and the Kyoto Protocol to the UNFCCC, the Copenhagen Accord contained no legally binding commitments to cut GHG emissions and no agreement on a “peak year” after which emissions must decline.
- The Accord “recognizes” the goal of limiting global temperature rise to less than 2 degrees from 19th C pre-industrial levels.

The Copenhagen Accord

- The Accord outlined a goal to provide \$100 billion a year by the year 2020 (with \$10 billion per year over the next three years) to help poor countries cope with impact of climate change. A large portion of this financing will be routed through a new body called the Copenhagen Green Climate Fund.

The Copenhagen Accord

- The Accord called on individual developed nations to submit their emissions reductions schedules for the next ten years (to 2020) by 31 January 2010.
- For the first time, developing countries will also submit commitments to manage their emissions, in a way that is “nationally appropriate” and in the context of “sustainable development.”
- All countries report on the progress they have made towards these targets every two years.

Climate Change and Global Governance

- COP 16: Cancun (2010)

The Cancun Conference

- For the first time, there is an international commitment to “deep cuts in global greenhouse gas emissions” to hold the increase in global average temperature below 2 degrees Celsius.
- This includes processes for adopting targets for peaking emissions as soon as possible, and substantially reducing them by 2050.

The Cancun Conference

- Cancun also agreed to a formula for addressing the issue of forestry and climate change. A contentious issue since Kyoto, the conference agreed to compensate developing countries for keeping trees standing rather than logging them.
- However, the agreements made at the Cancun conference did not settle the future of the Kyoto Protocol, and did not have the status of a legally binding amendment to the Kyoto protocol.

The Cancun Conference

- The Cancun conference also agreed to develop systems for measuring, reporting and verifying emission reductions.
- A commitment was made to help developing countries with low-carbon technology and help them with adaptation to climate change. The conference established a Green Climate Fund of \$100 billion to support these efforts.

Climate Change and Global Governance

- COP 17: Durban (28 Nov. – 11 Dec. 2010)
- 12,480 participants

The Durban Platform for Enhanced Action

- All signatories (including US, China, India) agree in principle to carbon emission reductions.
- All signatories agree to establish a legally-binding treaty on emissions by 2015, to take effect by 2020.
- All signatories agree to support a Green Climate Fund to support developing countries.