Climate Change and Global Governance (con't)

Well, I hope you enjoyed the simulation. These kinds of activities are used a lot in the social sciences and humanities because they can capture the essence of many experiences in the social world of human interactions.

We left off at Kyoto last class, so I began with what happened (in real life) at:

Copenhagen!

COP15 of the UNFCCC was held in Copenhagen in December 2009 over the course of two weeks. 193 countries were represented. The negotiations were very contentious, characterized by accusations and acrimony, and a walkout by developing countries that suspended negotiations for five hours. Negotiations had taken place months and years in advance, but had made only limited progress so a great deal had to be discussed at the actual conference, and in retrospect too much had been left to the last minute. What emerged from Copenhagen was, depending on who you talk to, a disappointing agreement with some positive developments, or a complete and utter disaster.

The first thing to note about the Copenhagen Accord is that it is not legally binding. Unlike the UNFCCC and the Kyoto Protocol to the UNFCCC, the Copenhagen Accord contains no legally binding commitments to cut GHG emissions. Instead of imposing collectively negotiated targets for emissions reductions on UNFCCC signatories, the Accord calls on individual developed nations to submit their own reductions schedules for the next ten years by 31 January 2010. There is no agreement in the Accord 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, but again this is

not a legally binding commitment. The Accord does promise $30 billion in aid for developing countries over next three years, with a larger goal of providing $100 billion by 2020. The Accord does obligate developing countries to submit commitments to manage their emissions, but in a way that is "nationally appropriate" and consistent with "sustainable development" which of course could mean almost anything (which is why the Accord was worded this way). All countries will report on the progress they have made towards their targets every two years.

Another big piece to note about the Copenhagen conference is the evolution of the US and Canadian positions by this time. If you recall, the US position was to cut GHG emissions to 17% below 2005 levels by year 2020 (this meant a cut of 4% below 1990 levels). Note that moving the baseline to 2005 made it look like the U.S. was cutting more than it really was (17% as opposed to 4%) and essentially forgiving itself for the emissions of the past by setting a new (2005) baseline. Also, this meant the gap between the U.S. and others (the E.U. for example, with its pledge to cut to 20% below the 1990 baseline) was a pretty big one. This effort to change baselines was huge, because the entire UNFCCC was built around the 1990 baseline. By seeking to change it, the US and Canada were really challenging the entire foundation of the UNFCCC and the Kyoto protocol.

So some progress, perhaps. But all in all, Copenhagen was a failure next to its ultimate objective: a legally binding global treaty to replace the Kyoto Protocol. And then it was off to:

Cancun!

COP16 of the UNFCCC was held in Cancun. Obviously, the Copenhagen Conference was a big blow to the UNFCCC process, and the future of that process was in doubt heading to Mexico.

Some have questioned the wisdom of continuing the UNFCCC process, because getting agreement on something so contentious as carbon emissions from 193 states in a pressure packed conference full of political posturing and conflict has proven difficult, if not impossible. However, if we terminate the UNFCCC process, what then? What replaces it?

At Cancun, there was a call for the preservation of the UNFCCC process. There were some symbolic developments. At Cancun, a widespread commitment to "deep cuts" in global greenhouse gas emissions to hold the increase in global average temperature below 2 degrees Celsius was agreed to by all participants. While this included various processes for adopting targets for peaking emissions as soon as possible, and substantially reducing them by 2050, the reality is that none of it was binding.

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. Cancun also agreed to compensate developing countries for keeping trees standing rather than logging them.

However, the agreements made at the Cancun conference did not have the status of a legally binding amendment to the Kyoto protocol. So many were disappointed. This rather bad mood carried over to the next meeting in:

Durban!

So now it is on to COP 17, in Durban (South Africa), in November/December 2011). There were 12,480 participants so it was a big group. The negotiations were once again contentious,

with most of the positions similar to the ones held at Copenhagen and Cancun. Some progress was made but overall the conference was a disappointment as no treaty (or clear pathway to a treaty) emerged from the discussions. The whole conference narrowly escaped collapse, and in fact was extended by a day or two in an effort to build some kind of an agreed outcome.

The result was the Durban Platform for Enhanced Action. In it, all signatories to the Platform (including the US, China, India) agreed in principle to carbon emission reductions. Great, but hardly groundbreaking. Perhaps more significantly, all signatories agreed to establish a legally binding treaty on emissions by 2015, to take effect by 2020. They also agreed to support a Green Climate Fund to help developing countries adapt in the face of climate change impacts. However, this was yet another example of delaying action and another example of a major COP ending in an agreement to reach an agreement at some future point.

And then it was time to go to:

Doha!

The goal at Doha was agree to a framework for negotiations on a treaty that would be agreed to consistent with the Durban Platform: that is, a new treaty by 2015 to come into force in 2020. Unfortunately, little progress was made on that framework, leaving precious little time before 2015 to get the outline of a treaty in place.

So what was agreed to? Well, the Kyoto Protocol was extended until 2020 so that is something. But many countries did not agree to this extension, namely Canada, Japan, Russia, Belarus, Ukraine, New Zealand, or the USA (or China, India, and Brazil, for that matter). So that means the countries responsible for over 80% of emissions did not agree to extend Kyoto.

The Doha Conference also reaffirmed the Durban Platform to develop a successor to the Kyoto Protocol by 2015 for implementation in 2020. So everyone agreed to agree on something they had already agreed on.

One interesting new wrinkle was the inclusion of "loss and damage" principle. The idea here is that countries that fail to curb their carbon emissions may obligated to financially compensate countries vulnerable to climate change. It sounds good, but does anyone actually believe this will happen?

Then it was off to:

Warsaw!

Well, basically nothing happened at Warsaw (COP 19) in 2013. There was still no agreement on a treaty, and no appreciable progress toward having one ready for 2015.

And then in 2014 the fifth IPCC Assessment report was published, which stated: "Warming of the climate system is unequivocal, and since the 1950's many of the observed changes are unprecedented over decades to millennia."

COP 20 will be held in Lima in December 2014. No one is holding his or her breath, but the 2015 deadline for a new treaty is fast approaching, and there does not seem to be any momentum building toward a treaty.

So is there any silver lining to all of this? A new kind of climate change politics may emerge out of Copenhagen, Cancun, Durban, and Doha, and in fact the entire post-Kyoto process. This new politics will be driven by individuals, activist organizations, communities, local and regional government, and the emerging

"green sector" of the economy, all impatient with the slow pace of international talks through the UNFCCC process. This is sometimes called the "bottom up" approach. But at the end of the day, it is states that make laws and regulations, and it is states that enforce those laws and regulations. Can we reduce emissions decisively using a model of change that does not include a binding, effective global treaty supported by most states and their governments?

So can individuals and countries do what the international community seems unable to do?

Climate Change and Us

The readings examine the major psychological and ethical dimensions of climate change, so I stayed a bit clear of those in the lecture. I did want to emphasize a few well-known phenomena that impact on human capacities to deal with climate change.

1. The Generation Gap Problem

I just wanted to make an important point here about the timescale factor when dealing with climate change. The bottom line is that climate has a much longer timescale that makes it hard to perceive changes in one lifetime. This long timescale (a timescale which spans generations) creates a "Generation Gap" which affects our decision-making when it comes to mitigation and adaptation. How much are individuals and societies willing to do now for the sake of future generations? We will see little or no benefit for 30-40 years of the politically difficult and perhaps economically painful decisions we make now. So why make them?

This is the point behind the "precautionary principle" which can be defined as: "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). This is an important part of the thinking about climate change: we should do something about green house gas emissions even if we are not sure of the ultimate effects of climate change because the consequences are so great. To put it another way: to refuse to act because of uncertainty is either to deny that climate change exists, or to argue that doing nothing is a justifiable response to uncertainty. Of course, the uncertainty element is basically gone now, so maybe the precautionary principle is not as relevant as it once was, unless you are trying to convince someone who is a little skeptical.

2. Not just another environmental problem

Here I wanted to make the point that previous environmental issues did not have the same scope as climate change does. Chemical pollution was a big deal in the 1960's, focused largely on Dichloro-Diphenyl-Trichloroethane (DDT), which was used as a pesticide. Nasty stuff, but the effects were more (though not exclusively) localized, the problem could be addressed at level of national jurisdiction, and the chemical was not central to contemporary economies.

The same was true of acid rain, caused by sulphate aerosols and nitrates from fossil fuels reacting with water in the atmosphere and on the ground to produce sulphuric acid and nitric acid. Not good. The problem was addressed (although it took a while) but this was different from climate change because sulphate is a minor emission, it can be removed from emissions at low cost, and the effects were localized to areas of Europe and North America (for the most part).

The ozone layer hole was also different from climate change because ozone-destroying Chlorofluorocarbons (CFCs) were not central to economy and there were easy substitutes.

Climate change is different because it is truly global in scope and impact: the consequences of climate change for human well-being, economic growth, and social impact are enormous. Furthermore, the activities causing it are at the core of economic activity: 80% of world energy is generated from fossil fuels, and is intimately related to energy use, transportation, food production, housing, construction, land use, etc. As a result, the issue of climate change cannot be addressed by a simple technological corrective or a few small policy changes.

3. Ethics, Equity and Justice

Ethical issues are really important in the climate change dialogue. The impact of climate change on human systems is global in scale, but is and will be unequal in its effects: different regions, countries, and areas will experience climate change impacts differently. At the same time these different regions and countries have different capacities and resources to meet the challenges of climate change for their populations. It is a sad fact that the hardest hit areas of the world will be areas that are already poor, and have very small or nonexistent capacities to adapt.

Then there is the issue of responsibility. A core ethical issue in climate change is how to allocate the costs of mitigation and adaptation. The general ethical consensus is that developed countries bear the main responsibility given their historical culpability for most emissions. But this can be challenged on two levels. One argument suggests that because most of these emissions were made in ignorance the developed countries cannot be held accountable for them. And then there is the practical

matter that no agreed framework for measuring responsibility or accountability exists.

President Bush put it this way:

> "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."

You can make an ethical case for that statement. Of course, you can also make an ethical statement out of the fact that with 4% of the world's population, the US emits 20% of all greenhouse gases.

4. **Social Change is Hard**

I think this is a very cool part of the humanities discussion on climate change. Jared Diamond asks why some societies adapted to change while others have not (and thus disappeared). His basic argument is that societies need to be able to question and rethink the values and principles on which they are based and make changes if they are to overcome the challenges they face. Well, we face climate change and that means rethinking our ideas about economic growth and wealth, our ideas about the cost of everything we do, and our relationship with the natural world.

The concern is that our societies (in the industrialized world at least) have become so consumer and individual-oriented that we are no longer capable as a collective of taking effective action on issues such as climate change. As Bill Mckibben has pointed out:

> "…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."

And check out this quote from the philosopher Norman Care:

> "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."

Climate change therefore raises fundamental questions about us as humans, and highlights the relevance of understanding ethics, philosophy, politics, human geography, sociology, journalism, international relations, and psychology among many other disciplines in the social sciences and humanities. Let's take a closer look at one social science and how it addresses climate change: economics.

5. Economics

Climate change is a challenge for economists, who usually analyze choices individuals or groups or states make based on their own preferences (based on analysis of costs and benefits).

Economics is not particularly good at weighing the welfare of a current generation against the welfare of future generations; it is not particularly good at comparing the costs to rich peoples against the cost to poor peoples; it is downright lousy at predicting how much people are willing to sacrifice today for the sake of the future; and it stinks when it comes to measuring the costs associated with damage or loss of ecosystems, plant and animal

species, etc. Even Robert Watson, a former Chair of the IPCC, has weighed in with this statement:

> "Markets recognize the value of food, biomass for energy, pharmaceuticals for health and ecotourism. However, they do not recognize the importance of ecological services that provide the very foundation for sustainable development and human welfare … Nor do markets recognize the option value, the undiscovered drug, the undiscovered wild relative of an agricultural product we may need in the future, the existence value of biological species, and the cultural, religious, and aesthetic value of biological resources." Robert Watson (Env. Dir. World Bank and Chair IPCC)

However, economists do have a very thought provoking explanation for how we got here. 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.

Furthermore, individuals and states are typically unwilling to reduce GHG emissions unilaterally (on their own) because they would pay the full price of reducing their emissions, but gain only a fraction of the benefits (if any). How depressing. But hey, it's economics!

Economists have a number of concepts they use to explain climate change and the circumstances surrounding it. Actually, these concepts are used in Political Science and other disciplines as well, so we could say these are "political economy" approaches and we would not be off base. Here are some examples of these concepts (we cannot cover all of them of course). At some point or another, you will encounter them in domestic or international debates about climate change.

The Tragedy of the Commons

This is a famous argument made by an ecologist, Garret Hardin, in an article published in the journal *Science* (titled "The Tragedy of the Commons") in 1968. The article (to paraphrase) tells the story of a town where townsfolk grazed their cows on a commons (an open pastureland open to all). As the town grew and the number of cows increased, the demand on the pastureland increased as each citizen of the town grazed their growing herds on the pastureland. Their incentive was to get as much grass for their cows as possible, and so the rate of destruction increased until the commons could no longer grow grass. The cows died, and the town collapsed. This story is used as an allegory for the global environment today.

Now, economists express this idea in the following way: Tragedy of the Commons occurs when over exploitation of a limited-capacity resource due to unrestricted entry leads to its total collapse. This is a much tighter definition and avoids having to get into cows and pastures. But somehow, I just like the cows and pastures part.

Hardin had a particular conclusion to the Tragedy of the Commons problem. He believed that property rights would avoid this abuse of commonly held resources. This created a critical movement called the tragedy of the anti-commons, which illustrated the social injustices and economic negatives of poor use of resources controlled by a few private landowners. So maybe private property is not an answer to the Tragedy of the Commons.

The public good dilemma

Economics also contributes the concept of public goods to our discussion. Public goods possess two qualities: 1) they are

nonexcludable, meaning they are goods that are readily available to all (even to those who do not contribute to their creation or maintenance) and they cannot be easily denied to others; and 2) they are nonrival, meaning that the use of the good by one actor does not seriously deplete the amount available to other actors. A piece of pie is not a public good, but air is a public good and so is common land, a sidewalk, and…the environment.

The issue with public goods is how to manage them. If no one manages a public good, it can deteriorate or run out, to the detriment of all. Basically, there are two ways of managing public goods: through hegemony (a dominant actor that manages the good on behalf of everyone else either because it has the coercive power to do so or because it is trusted); or multilateralism, whereby a consensus is reached on joint management of the good. Note the far - reaching implications for the future: is the climate best managed by a dominant actor (fair or foul) or by efforts to achieve consensus (which may never happen?)

The Free Rider Problem

In economics, collective bargaining, psychology, and political science, "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. The name "free rider" comes from a common textbook example of this problem: people using public transportation without paying the fare. If too many people do this, the system will not have enough money to operate and will collapse.

When it comes to climate change, the free rider problem is huge: greenhouse gas emissions cuts will be economically costly, so states may choose not to cut, thus free riding off the public good of the environment and the efforts of other states to cut their own emissions.

The possible solutions to these problems raise a number of economic and political questions (as well as opportunities). One response is to create or increase taxes. This establishes a pool of resources that can be used to maintain public goods: everyone has to pay in whether they use the system or not, but no one free rides, because they cannot (or run the risk of coming up on tax evasion charges). So can we have taxes on carbon, both domestically and internationally? A second response is to appeal to altruism, the sense that people will do the right thing. That work more often than generally thought: most people will pay their fare for public transit, for example, even if the costs of free riding (small chance of being caught, small penalties) are low. Third, public goods can be made private, so people have a stake in their maintenance and protection. And finally, we can make laws: legislation can require people to act in certain ways (presumably consistent with the public good) such as reducing carbon emissions. There is a lot of discussion and debate on these points in economics and of course public policy.

Keep these problems in mind. Economists have a lot to tell us about climate change, even as they sometimes struggle to include climate change in liberal economic theory.

I then made the point about the dominance of fossil fuels in our global energy structure. Coal use is still alive and well. 25 percent of global energy demand is met by coal. The US has the equivalent of five hundred 500-megawatt coal fired power plants, while China is adding the equivalent of two such plants per week. The emissions bottom line is that each of these plants produces about 3 million tons of CO2 per year.

Then I talked about the economics (and politics) of energy conversion. This is really cool stuff, especially if you are interested in the future (which I expect most of us are). Reducing

the emissions of GHG that cause global warming will require fundamental change in the global energy system. The economics and politics of this transition is one of the biggest features of the climate change debate. Climate change skeptics are shifting their arguments away from scientific uncertainty toward the argument that prevention (cutting emissions) is more expensive than adaptation (adjusting to changing climate conditions), so this debate is just "heating up."

Macro-economic studies of the cost to the world economy of conversion range from a slight benefit (that is, world GDP might actually grow) to as much as five percent by some future date (usually 2030 or 2050).

Using GDP data to measure the cost of global warming and emission reductions does come with problems, because GDP data is calculated in certain ways. Expenditures by government, or capital investment by business, will generally add to GDP, while costs incurred by individuals or businesses will not add to GDP (and may even lower it). So, replacing a coal - fired power plant with a wind farm will add to GDP.

On the other hand, adding a carbon sequestration device to a coal - fired power plant will not add to GDP (and may lower it) because it is an increase in the cost of running the power plant. The costs of doing these two things may be the same, and the emissions reductions may be the same, but the GDP calculations are different. I know, this really does not make sense, but that is the point: debates over whether GDP will be helped or harmed (and by how much) are at least somewhat deceptive, because they depend how you add up GDP.

Why does encouraging energy efficiency seem to be such a problem? Pursuing energy efficiency is not attractive from a large - scale economic point of view because it involves many small

decisions and changes that are hard to invest in collectively. Big investors are looking for big deals: it is easier to sign a big check for a new nuclear power plant or a solar power plant than it is to invest in lots of small changes in buildings or consumer products. As Warren Buffet once explained: "[i]t is easier to make one $10 billion deal than ten $1 billion deals." Sounds like a nice place to be. But in energy efficiency, you are talking about 10 million $1000 deals (windows, insulation, light bulbs). So, investors would rather invest in a solar power plant that produces energy at 12-40 cents per kilowatt hour, rather than into conservation at 4 cents per kilowatt hour.

We hear a lot about what we need to do from a regulatory perspective to reduce emissions and encourage an energy transition. These strategies are all grounded in economics, and the interface between politics and economics.

- Carbon taxes to increase incentives to reduce carbon emissions
- Subsidies to alternate energy sources (wind, solar costs dropping)
- 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
- Market systems (carbon trading and cap and trade systems)

And then we moved on to domestic politics.

6. Domestic Politics

There is just not time to go into detailed studies of domestic politics in this course, but I wanted to make two fundamental

points. First, where does national climate change policy come from? The answer is a complex set of variables that are often unique to the political environment within that state, influenced by external factors. Second, we can understand different national climate change policies by using the techniques of comparative politics: comparing different cases to isolate similarities and differences.

In terms of where national climate change policies come from, I suggested that the following influences were most important:

- The state and government: political system, attitude of leaders, partisan politics;

- Industry and the market: the role of industry and economic actors;

- Civil society: engaged actors; the media; public perceptions and opinion;

- Science: role of science in society and on decision makers.

First, I compared Canada and the US, and the different attitudes that exist in both otherwise rather similar societies across the border. Hey, the science of climate change is the same on both sides of the border right? So why are attitudes different? Well, the answer lies in different national debates informed by different efforts to influence those debates.

Then I compared Japan, the Netherlands, and the US with a level of superficiality that would make any comparative politics scholar flush with outrage. But hey, they can teach their own course. It is the idea of differences and how they come about that is meaningful for us here. I used examples from the U.S. to illustrate

how domestic factors have driven U.S. government policy on climate change.

The State and Government

Japan is an example of a top down approach: much of climate change policy driven by government, which reached the conclusion that economic growth and climate change mitigation are not mutually exclusive.

The **Netherlands** is known for collaborative and consensual politics at the government level. There is general support for collaboration between society, government and industry.

In the **US**, there is no government consensus on climate change, and in fact the government (at least at the level of the executive branch and the Bush Administration) is actively opposed to climate change as a concept and by extension mitigation and adaptation strategies. There is a lot of evidence of a systematic effort by the Bush Administration to silence government scientists, suppress or edit scientific warnings about climate change, and systematically challenge the science of climate change. A classic example of his is an internal memo written by Frank Luntz, a republican pollster (who has since repudiated his own views), which included the following statements (these and some other examples are from a BBC Panorama documentary):

> "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."

There was a lot more of this, but you get the idea. Note that a lot of states in the US are pursuing climate change policies on their own, most notably California.

The Market and Industry

In **Japan**, industry was consulted and generally supportive of government position.

In the **Netherlands**, industry was very skeptical of climate change science and initially very resistant, but now most industries in the Netherlands are not fighting climate change. Instead, they are looking for economic opportunities in climate change mitigation.

In the **US**, industry and organized labour mobilized to prevent emissions reductions and the ratification of Kyoto. Business in particular undercut public and government support for climate change mitigation, using the same techniques as the tobacco industry: create uncertainty about the science because as long as there is uncertainty you can fight regulation and keep on doing what you are doing (selling cigarettes or emitting GHGs). Of course, not all industries are culprits: companies in the automobile and energy sectors have adopted voluntary emissions programs, but these have had a small impact overall.

A good example of industry efforts to suppress scientific reporting on climate change was the fate of a document known as The National Assessment on Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change. This report was a comprehensive examination of the

impact of climate change on the U.S. The Assessment was the result of ten years of work (between 1990 and 2000) by hundreds of scientists from 20 university teams, five teams studying the US economy, and a US government scientific advisory group. Prior to the launch of the report, a lawsuit was filed to prevent its release. The lawsuit was mounted by members of Congress (led by US senator James Inhofe of Oklahoma) and the Competitive Enterprise Institute (a think-tank funded by industry interests). The report was challenged for being based on "models" and not on scientific evidence, and was called "unscientific" and "unethical." The lawsuit was eventually thrown out, but the damage was done. The report had been ridiculed and undermined, and it was never widely distributed, and never became part of the public debate.

Civil society

In **Japan**, civil society actors were not big players in the shaping of climate change policy.

In the **Netherlands**, civil society actors played a notable role in raising awareness and engaging in the policy debate about how best to respond.

The intense debate in the **US** was fueled by large and well funded not-for profit conservative organizations, funded by industry, that have cast doubt on the science of climate change. There was little or no coordination or cooperation between US government and environmental groups: environmental groups opposed compromise, criticized the Clinton administration during the Kyoto process, and was an opponent, not an ally, of the US position in climate change negotiations. The debate over climate change has therefore become polarized and a battleground for partisan politics rather than social consensus.

An example of this kind of effort was the work of a civil society actor called the Greening the Earth Society. The Western Fuels Society sponsored this NGO (which no longer exists). The Society argued that the science behind global warming is not uncertain, but just wrong. There has been no steady rise or steady decrease in warming, and 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.

Now, the science says almost exactly the opposite. But this does not prevent such organizations from saying otherwise, and confusing the debate by cluttering the dialogue and creating impressions of a debate where none exists (at least when it comes to the science).

Science

In **Japan**, skepticism about the science of climate change dissipated quite quickly and there were few challenges to the science.

In the **Netherlands**, skepticism of climate change science remains in industry, but is no longer publicly expressed because of fear of backlash from a public that is generally aware and acceptant of the problem.

In the **US**, skepticism is a powerful force and a part of the "debate." Check out this statement from Senator James M. Inhofe:

"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."

Developments in the United States

Things have changed a bit but much remains the same. The proposed American Clean Energy and Security Act (2009) called for emissions reductions of 17% below 2005 levels by year 2020 (4% below 1990 levels). The proposal passed the House but failed to pass the Senate. This was due to the high level of opposition in the Senate, which included a large number of Senators representing Midwest states that do not feel the coastal impact of climate change but are highly dependent on coal and manufacturing.

There has also been extensive opposition from business, including lobbying by the National Association of Manufacturers, the American Petroleum Institute, and the US Chamber of Commerce. According to the Economist, in 2009 the energy industry spent $300 million on 2,225 lobbyists in Washington, and donated twice as much campaign funding to the bills opponents than to the bills supporters. Climate change skepticism is on the rise: in April 2008 71% of Americans thought there was solid evidence of rising global temperatures: in October 2009, only 57% thought so. And in April 2008, 47% of Americans blamed rising temperatures on human activity: in October of 2009, only 36% thought so. Economic recession seems to undermine the faith in climate change science pretty easily. Or maybe people do not want to think of themselves as hypocrites: it is easier to accept policies that will increase carbon emissions but might get you a job or save you some money in hard times if you decide that maybe climate change is not real or that threatening after all.

With that, we are going to leave climate change behind. But watch for more developments on this subject, which really shows how physical and life sciences and social sciences and humanities are basically inseparable and necessary knowledge bases for a complete understanding of climate change.