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The Influence of Political Culture on the Formation of Pre-Regime Climate Change Policies in Sweden, the United States, and Japan

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Working Paper

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Sweden, the United States and Japan**

Anne K. Johnson

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Preface

What happens to international environmental agreements once they are signed, and how does the implementation of such agreements influence their effectiveness? These are the questions that motivate the IIASA project "Implementation and Effectiveness of International Environmental Commitments (IEC)."

A challenge to such research is the fact that hundreds of factors influence the extent to which international environmental commitments are implemented effectively within different countries. Is there a parsimonious theory that makes sense of this diversity and offers a powerful tool for predicting how states will implement international commitments and when implementation will be effective? One candidate is "cultural theory," which posits that people fall into a small number of cultural types, which in turn uniquely explain their preferred styles of decision making and behavior. If true, cultural theory could also be a powerful tool to explain how people, and like-minded groups of people, agree upon and implement policies, including policies to address common international environmental problems.

In this paper, Anne K. Johnson develops five "predictions" of cultural theory and uses them to "test" the extent to which the theory adequately describes the behavior of three countries: Japan, Sweden, and the United States, which, she argues, are representative of the three main cultural types. For each country she applies the tests to the global warming policies developed and implemented through 1992, when the Framework Convention on Climate Change was adopted. While many studies explore how countries implement policies *after* international rules are agreed, this "pre-regime implementation" is interesting because these countries varied markedly in the ways in which they viewed the problem of global warming and what policy instruments they should implement to slow global warming.

According to Johnson, cultural theory does well in explaining the behavior of these three states: cultural theory is not falsified in 73% (11 of 15) of the tests she applies.

This work was conducted in 1994 while Johnson visited IIASA with financing from Battelle/Pacific Northwest Laboratories (United States) and the IEC project. IEC's research is not conducted in the cultural theory framework, but this study is one effort to ensure that the IEC research explores a wide range of theories.

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Abstract

This paper tests the claims of cultural theory using the formation of climate change policies in Sweden, the United States and Japan as case studies. Cultural theory is frequently employed by social scientists to explain various aspects of human behavior. The theory posits that any social group consists of three main cultural types: the egalitarian, the market-oriented, and the hierarchical. Though all groups contain elements of each, one cultural type usually predominates, giving the group its unique decision-making character. In the egalitarian group, for example, decision-making is based on broad consensus of the group, and decisions are aimed at providing equal benefits to all members. In a market culture, by contrast, the primary focus is on maximizing benefits to the individual. Decisions are often made based on market principles (i.e., relative prices). In a hierarchy-dominant society, decision-making is highly centralized, with a few powerful bodies making decisions for the entire society. This type of group tends to be very bureaucratic, with a great deal of emphasis on administrative procedure. This paper applies cultural theory at the national level and tests to what extent the theory is able to project how countries will respond in addressing the issue of global warming. For the purposes of this study, Sweden best represents the egalitarian-dominant culture; the United States best exemplifies market-dominant culture, and Japan is the most appropriate example of a culture dominated by hierarchical elements.

To test the theory, the following five questions are asked:

- 1) what does the theory predict about how countries will view their role in a global commons problem?
- 2) what does the theory predict about the nature of the policy-making process within each society?
- 3) what does the theory predict about each country's likely choice of policy instruments?
- 4) what does the theory predict about the speed of policy-making and implementation?
- 5) what does the theory predict about how countries will view the role of technology in solving environmental problems? And if there is a role, where does the drive to innovate originate?

The paper then describes the development of global climate change policies in each of the three countries, including a discussion of the motivations that led each country to act on the issue. Finally, it analyzes to what extent actual events in the three countries corresponded to the theory's predictions.

The theory was strongest in predicting the nature of the policy making process and weakest in predicting the choice of policy instruments. In spite of its limitations, cultural theory suggests the importance of cultural influences in the policy making process. Because it helps us to understand how different types of societies arrive at decisions regarding matters of international concern, moreover, the theory could prove extremely useful to those involved in developing international agreements, enabling them to formulate an agreement which is compatible with various types of societies.

I. Introduction

By the time they signed the Framework Convention on Global Climate Change in Rio de Janeiro, Brazil in 1992, most of the world's industrialized countries had declared, and many had taken some unilateral measures to reduce emissions of greenhouse gases. This "pre-regime" implementation on the domestic level had a significant influence on the development of the final agreement, determining to some extent its contents, and it is now shaping expectations as the first protocol to the agreement is negotiated.

Despite consensus by the developed countries on the need to mitigate the problem of global warming, each country approached the greenhouse gas (GHG) problem very differently at home. These differences in framing the problem and devising and implementing GHG reduction strategies and in distributing the burdens of emissions fairly are attributable to a variety of factors, including a difference in political culture. The purpose of this paper is to examine the influence of political culture on the development of climate change policy in three countries.

In the context of policy making, national culture refers to the framework used by citizens of a given country to impose order on events. A recognized model of institutional decision-making, called cultural theory, identifies three cultural elements that combine and compete to give each society its distinctive political character. These are the hierarchical, the individualist/market-oriented, and the egalitarian-collectivist (Douglas and Wildavsky 1982).¹ The interaction of these three cultural types within a given setting shapes the debate on major social issues and influences their outcomes. While every society contains elements of all three cultural types, one usually predominates. At issue is the question of how arguments must be framed within a given cultural group if the arguments are to be credible to the group.

In the egalitarian/collectivist culture, decision-making occurs at the group level and is based on consensus among group members. Emphasis is on the group acting as a whole (Schwarz and Thompson 1990). Contrary to the hierarchical system, which relies heavily on rules and procedures in decision-making, or the market system, which puts a premium on decision-maker skill

¹ Some cultural theorists describe four cultural types, the fourth being the the so-called "residual" type, which consists of actors on the margins of world events. These groups, lacking resources for future investment or to change their current impoverished status, focus attention on meeting their immediate needs and thus are not able to concern themselves extensively with larger global issues (Rayner 1984). In the international arena, residual nations would include the poorer nations of Africa and Asia. Because these countries have had little experience in implementing global warming policies, however, this cultural type is not analyzed in this study.

and particular argument and its ability to bring members to agree upon it, decision-making within the egalitarian system is based on the strength of the logic of a particular argument and its ability to bring members to agree upon it. This type of culture is also future-oriented and shows great concern for the welfare of future generations. It is also generally risk-averse; risks which do exist should be spread evenly across the entire society. Sweden, with its decentralized political structure and long traditions of social welfare, social pluralism, and community-based decision-making, exemplifies the egalitarian/collectivist culture.

In the individualist/market-based institutional culture, the emphasis is on maximizing benefits to the individual, and market principles often constitute the basis for policy decisions. Discretion in decision-making rests with individuals and firms through the use of market mechanisms. In devising policy, market cultures generally reject regulation and take a positive attitude toward risk. Indeed, risk is seen as a necessary element of success. These competitive pressures give rise to the short-term focus that is characteristic of market cultures. It is important to note that, with respect to cultural theory, the definition of a market culture is not limited to a method of doing business involving the exchange of goods and services. Rather, the market culture embraces an entire system of decision-making, in which individuals must often fend for themselves because group solidarity is weak. Because of its traditional preference for market mechanisms and emphasis on individual freedom and rights, the United States is a good example of this type of institutional culture.

The hierarchy-dominant system is characterized by a great degree of centralization, with decision-making responsibility often lying within a particular office. The system takes a conservative approach to risk and favors decisions that promote stability. Its emphasis is on control and system maintenance over the long term, and in contrast to market cultures, where the concept of time has a very short-term focus, hierarchies have long institutional memories and aim to preserve the status quo. The hierarchy-dominant system is further characterized by its preferences for administrative procedure; problems are reduced to routine whenever possible, and resources are allocated based on technocratic assessment of needs (Rayner 1991). Japan, with its centralized national decision-making structure, its emphasis on managerialism, and its traditionally future-oriented, long-term approach to policy-making, is an example of this type of culture.

Viewing climate change policy through the lens of cultural theory may make it possible for us to better understand the process of policy implementation within a given country as well as the country's choice of policies to reduce the threat of global warming. Unlike the traditional political economy approach to comparing countries' policy choices, cultural theory recognizes that there are cultural constraints on how a society may respond to challenges it faces. For example, in the past, political scientists, using the comparative political economy approach, have compared

the policy making environments of the United States and European countries, namely Sweden, Britain, France, and West Germany.² These studies have attempted to explain why U.S. regulations, which are often stricter than those of other countries, are not necessarily more effective. They conclude that the U.S. system of government, consisting of equally strong executive, legislative, and judicial branches and which encourages public participation in the rule-making process, fosters discord among the competing interest groups, thereby hampering policymakers' ability to develop effective, implementable policies. Each of the studies offers recommendations for how the U.S. could enhance its regulatory effectiveness by emulating the other countries' approaches. While the recommendations may be sound, it is clear that in the decade or so since those works have been published, little has actually changed in the U.S.--the same weaknesses still appear. This is because the organizational behavior and policy making processes within one society are not readily translatable to another, owing to differences in culture, history, national values, and a host of other factors. Thus, in order for policies to be effective within a given country, they must take into consideration the unique political and social context of the nation where they will be implemented. Cultural theory may therefore be a useful tool for projecting the success of various policy instruments within a given country and for identifying the major decision-making groups in each country.

Traditional political economy studies argue that the reason the U.S. society does not always achieve desired results is because of an ineffective political system. In contrast to those types of studies, this paper does not attempt to prove that the U.S.'--or any given country's--political system does not work, but rather demonstrates how differences in culture can affect political outcomes. A parsimonious theory is applied and evidence is cited to show that countries' decisions and policy actions are driven by their domestic cultures and are very difficult to change. Thus, political economy studies, downplaying cultural aspects, may be based on insufficient assumptions.

This paper will compare the design and implementation of greenhouse gas reduction strategies in three countries--the U.S., Sweden, and Japan--prior to the signing of the Framework Convention on Climate Change of 1992. The purpose of the paper is to test whether cultural theory can in fact project differences in national approaches to policy implementation. If its projections are correct, then the theory may be useful in formulating international agreements and in forecasting

² See David Vogel, 1986. *National Styles of Regulation*; Ronald Brickman, Sheila Jasanoff, and Thomas Ilgen, 1985. *Controlling Chemicals: the Politics of Regulation in Europe and the United States*; and Steven Kelman. 1981. *Regulating America, Regulating Sweden*.

future national actions, because it will enable negotiators to develop a final agreement that is compatible with different cultural types.

While various studies have been conducted on national approaches to the climate change problem, most are purely descriptive and do not satisfactorily explain why countries' approaches differ. These works focus mostly on the economic and political considerations that shape the global warming policy debate.³ This paper builds on those important studies, but goes one step further in offering an explanation of how social and cultural values influence the countries' decision-making processes and help determine outcomes.

It is important to note that cultural theory as it was originally conceived was intended to explain the behavior of individuals in smaller social groups, as opposed to countries. However, this paper applies the theory on a national scale to ascertain whether its projections at the highly aggregated level of the nation-state are valid. When it comes to the greenhouse gas issue, decisions, though ultimately made at the micro level (firms and households) are reflected at the national level. Similarly, international agreements are negotiated and contain obligations between national governments. Thus national level aggregation is appropriate for this type of study.

The paper is divided into four sections. The first establishes a series of five tests for cultural theory. The second one describes the climate change policies implemented in Sweden, the U.S. and Japan prior to their signing the Rio Convention. The third section of the paper analyzes whether or not cultural theory is a useful tool in projecting national behavior, based on the tests outlined in the first section. In the fourth section, the paper's conclusions are synthesized.

II. Predictions of Cultural Theory

Can cultural theory accurately predict how countries will respond to international policy issues? The theory will be tested using five questions:

1. what does the theory predict about how countries will view their role in a global commons problem?
2. what does the theory predict about the nature of the policy-making process within each society?
3. what does the theory predict about the country's likely choice of policy instruments?

³ See Michael Grubb et al, 1991. *Energy Policies and the Greenhouse Effect*, vols. I&II; Steinar Andresen, 1993. "U.S. Climate Policy: Ideology vs. Pragmatism;" Gunnar Fermann. 1992. "Japan in the Greenhouse."

4. what does the theory predict about the speed of the policy-making and implementation process?
5. what does the theory predict about how countries will view the role of technology in solving environmental problems? And if there is a role, where does the drive to innovate originate?

Global Commons Problem. The essence of the global commons problem is that the world's resources are limited and shared, and that each country will want to maximize its portion of the wealth. Consequently, each nation has an incentive to let other countries bear the burden of global environmental protection (in this case, greenhouse gas abatement measures). The question is, how does each cultural type view its role in managing the commons, and what is the responsibility of an individual country to cooperate on global issues when there is no higher authority to allocate rights, absent a consensus of the governed? Cultural theory suggests that egalitarian cultures, with their future-oriented, intergenerational focus, would believe that further degradation of the environment must be prevented so that succeeding generations can thrive. This type of society will believe that the world's resources should be evenly distributed, and all societies will bear equal responsibility for maintaining the commons. The egalitarian society will therefore take an aggressive approach to dealing with environmental problems and will be eager to act on a global level to preserve common resources.

Market cultures, on the other hand, will hold that resources should be allocated on a first come, first served basis: those who first gain access to common resources will have the right to control them; relative prices will determine subsequent consumption patterns. Market cultures also believe that global systems are resilient; they will only act on a commons problem if it is in their best economic interest to do so. If the costs of action outweigh the benefits, a market culture will not change its behavior. A market society tends to be oriented toward the short-term. This is because market thinking yields interest and discount rates, concepts which favor the near-term over the future. Owing to this overall short-term focus, therefore, market societies are less concerned with the welfare of future generations. For these reasons, such cultures will be less inclined than egalitarians to respond cooperatively on global issues.

Because hierarchies believe that those who can most afford to take action should do so, they will address the commons problem as long as the overall system is maintained. Usually they will be slow to respond to the threat. However, once the decision to act has been made, the hierarchy will allocate resources to combat the problem based on the bureaucracy's appraisal of needs. The response will be centralized, technocratic, and cautious.

The Policy-Making and Implementation Process. Cultural theory suggests that in an egalitarian-dominant system, the policy-making process will involve considerable debate among a wide

range of actors as the society struggles to obtain the consensus necessary to support a course of action. Though in egalitarian cultures social cohesion is generally high compared to market cultures, there could still be wide disagreement regarding the seriousness of the problem and the type of solution required to confront it. The policy making process will tend toward fractiousness, but since this type of society values solidarity and cooperation, different points of view will eventually converge through compromise.

In a market culture, emphasis is on maximizing benefits to the individual. Because there is less value placed on the welfare of the overall society, as in the case of an egalitarian/collectivist culture, like-minded groups compete with each other and are much less willing to compromise on issues of national concern. Marketplace mentality extends to policymaking--different interests compete; the currency is political power. The policy-making process is open to all and will therefore be contentious and discordant.

In a hierarchy-driven society, the process lacks the complexity of the other two societies because it is driven by major actors in a top-down, streamlined fashion. Once a powerful faction decides on a course of action, policy measures can be quickly implemented. While the hierarchical society values the presentation of sound scientific arguments, it generally does not encourage stakeholder groups to join in a national debate on major issues, which simplifies the process.

Choice of Policy Instruments. In an egalitarian-dominant society one would expect to find a combination of information and regulation as the primary policy instruments. Information activities can include advertising or educational campaigns, training programs, media coverage of government activities, and persuasion of key decision-makers, to name a few. The goal is to bring about the consensus that is so integral to egalitarian societies and to influence the behavior of individuals to correspond with larger social objectives. Governments sometimes use information about companies to expose them if they do not comply with laws and regulations. This type of pressure often brings recalcitrant firms into compliance with government objectives (US DOE 1989). Regulation is used to keep polluters in check, and it is significant that in an egalitarian culture the emphasis is on the *uniform application* of regulations, since the exercise of discretion by either the regulators or the regulated would violate principles of strict equality (Rayner 1991). Hence, when an egalitarian culture imposes regulations, these will be applied in such a way as to level the playing field so that all members of the society have the same opportunities.

In a market-oriented society one would expect market mechanisms, such as tradeable permits and price incentives, to be the primary policy instruments. These measures leave the decision of whether and how much to pay for a clean/safe environment, to the discretion of individual firms and consumers. Market cultures will also favor research and development, since this is compatible with the society's drive to innovate.

Hierarchies may be expected to favor a combination of command measures and fiscal incentives. Because of their preferences for order, procedure, and control, they will be inclined toward regulation. However, these societies are often sympathetic to the concerns of the organizations and individuals they must oversee, so they will also support the use of fiscal incentives, which leave some implementation decisions to the discretion of the individual firms. Thus, application of restrictions will not be uniform, but instead will be distributed unevenly throughout the society (Rayner 1991).

Speed of Policy-Making and Implementation Process. Cultural theory also implies certain projections about the speed with which countries are able to implement policies once the decision to act has been made. From an egalitarian society, assuming that the required consensus already exists, one would expect implementation to be quick. Because there is agreement regarding the appropriate course of action relative to the problem, all actors can be expected to work together to ensure successful execution of the agreed-upon regimen. This is a strong contrast to the situation in a market-oriented society, where the contentious policy-making process extends to implementation. Thus, implementation would be very slow, even after policy has been decided upon. This is because those who disagree with a final policy choice are likely to challenge it, e.g., through time-consuming, adversarial legal proceedings. Much time is required to conduct the studies necessary to support the views of interested parties and to allow all groups to have their views heard. Such a system often leads to gridlock, and hence to actions that further postpone decisions. As a result, the final policies of market cultures lack teeth and are often viewed by the other countries as weak and ineffectual. Typically, in a hierarchical culture, a "top-down" orientation means that implementation is swift, because the powerful organization at the head has great authority to push through the desired policy measures. Resources can be quickly mobilized to serve the cause. In such a culture there is little tolerance for dissent or debate.

The Role of Technology. Cultural theory may also be able to explain the attitudes countries take toward technological innovation. Because egalitarian cultures view nature as fragile and endangered, cultural theory projects that these types of societies will not rely heavily on technological solutions in managing global problems. However, when they do apply technologies, they will prefer small-scale technologies that can be controlled in a decentralized way, since egalitarians reject centralization of power (Schwarz and Thompson 1990). Market cultures, by contrast, will rely heavily on technology to solve environmental problems and reduce uncertainty regarding the seriousness of any potential threats. These cultures view innovation as an important key to success. In this type of society, innovation will be driven by the free market; individual firms will have discretion to determine which technologies will most efficiently mitigate environmental problems.

Hierarchies will likewise take a positive attitude toward technology. They look favorably on it as a means of reducing uncertainties, creating solutions, and generating the information by which government decisions will be made. However, in this type of society, innovative efforts will be much more centralized than in a market culture (Schwarz and Thompson 1990). Typically, the government will be the primary sponsor of large-scale scientific research and development programs and will make decisions about technology investment.

III. Global Warming Policies in Sweden, the U.S., and Japan

Background

Many atmospheric scientists believe that greenhouse warming, caused by emissions of so-called greenhouse gases into the atmosphere, may occur over the next several decades. Greenhouse gases include carbon dioxide (CO₂); carbon monoxide (CO); nitrous oxide (N₂O); tropospheric ozone, methane (CH₄); and chlorofluorocarbons (CFCs). Carbon dioxide is the primary anthropogenic contributor to the greenhouse effect. Scientists predict that increasing atmospheric concentrations of CO₂ might cause a rise in the Earth's temperature of around 3 degrees C per decade over the next century (IPCC 1992). Among potential consequences of global warming are changing patterns of precipitation, including increased frequency of severe storms, changes in growing seasons and vegetation patterns, greatly reduced soil moisture in agricultural areas, and expansion of the oceans owing to melting of the earth's glaciers. Should this occur, some species of plants and animals may not be able to adapt to a change in climate and would die off, disrupting the ecosystem (IPCC 1990). Such dramatic changes in the earth's ecosystem would almost certainly affect the human community and have direct and indirect impacts on virtually all socio-economic systems. Floods and desertification could cause large-scale movement of peoples with unknown consequences for resource distribution and economic stability in some regions.

To fully understand possible impacts of climate change, more complete information regarding human interaction with the natural environment is required. Indeed, the incompleteness of scientific understanding is one of the most significant characteristics of the global change questions: while scientists predict that some degree of global warming is inevitable, they remain uncertain how much the earth may warm, what the time frame for such warming may be, or how change may affect the world's economies and ecosystems. The most sophisticated general circulation models can at best only estimate the consequences of global warming. Because of these persistent uncertainties and the potentially high costs involved in responding to global climate change, many nations are reluctant to formulate policies aimed at slowing global warming.

The following section describes how global warming policies were designed in Sweden, the United States and Japan. It focuses not only on the policies themselves, but also on the motivations that led each country both to address the climate change issue and to select the policy measures they did.

Sweden

Sweden's institutional decisionmaking culture is dominated by the collectivist/egalitarian cultural type, with a strong focus on the welfare of the total society. This orientation may have had its origins in the Middle Ages: since feudalism did not exist in Sweden, a strong hierarchical tradition never developed. Similarly, Sweden's early parliament, arising during Medieval times, consisted of four classes: the nobility, clergy, burgers, and peasants, all having equal representation. This democratic arrangement was highly unusual for that time in Europe, and it helped give birth to the Swedish cooperative spirit that exists today (Hampden-Turner and Trompenaars 1993).

Equality and moderation are Swedish ideals; society looks askance at people who stand out too much from the rest of the group. The commonly-used word *lagom* in Swedish expresses this preference for restraint and social balance. *Lagom* means, roughly, just the right amount--not too much and not too little to satisfy both one's own needs and the requirements of the larger society (Hampden-Turner and Trompenaars 1993).

Sweden is also very oriented toward consensus, accommodation, and consideration for others. This can be seen in the country's social policies, which guarantee generous pensions; access to health care; high-quality, state-supported education; maternity leave; and child care allowances. Instead of relying on private enterprise to provide these benefits, Swedes choose financing through taxes and employer contributions (Andrain 1994). It is noteworthy, in fact, that after several decades of rule by the Social Democratic party, which introduced the social programs described above, Swedish voters in 1991 elected a government led by Christian Democrats touting a more American-style system of reduced government spending and private ownership. Believing this type of system to be a failure, however, Swedes in 1994 voted this government out and replaced it by a Social Democrat-led coalition with the expectation that this government will reinstate the social programs that the former conservative government had attempted to dismantle during its short tenure. (Interestingly, the Social Democratic party is actually cutting social spending to alleviate budget shortfalls.)

Compromise is another essential element of Swedish society. Within the Swedish parliamentary system, the so-called "remiss" procedure allows government organizations, non-governmental organizations, firms, and municipalities the opportunity to review and comment on legisla-

tion proposed in the parliament with the result that the measure can pass smoothly. Indeed, parliament becomes in effect a rubber stamp for legislation that has been decided on long before through negotiation by interested parties (Loefstedt 1993). While the United States also allows stakeholder groups to debate policy issues, the Swedish system is oriented much more toward negotiation, compromise, and reaching an agreement that is acceptable to all parties. The tendency is for individuals to make concessions, adjusting their views to accommodate those of the rest of the society, unlike in the United States, where a harmonious convergence of public and private interests is rare (Kelman 1981).

Sweden had long been active on the science side of the global warming debate. On the domestic policy front, however, it was not until 1988 that global warming received serious consideration in the Swedish parliament, the *Riksdag*. Once the issue came to national attention, though, policy measures were soon undertaken.

Sweden has had a long history of environmental consciousness. Environmental groups have been active there for nearly a century. In 1967, moreover, Sweden was the first country to establish an Environmental Protection Board, and in 1969 the *Riksdag* passed one of the most comprehensive pieces of environmental legislation of any nation up until that time (Loefstedt 1993). The reason for the relatively late action on the climate change issue was not lack of public interest, but rather great national concern about the country's heavy reliance on nuclear energy. Indeed, the Swedish response to climate change must be viewed in the context of the national debate on nuclear power.

As far back as the early 1970s, many Swedes had protested the country's dependence on nuclear power, owing to concerns about high-level radioactive waste and plant safety. The Three Mile Island incident in the U.S. in 1976 heightened this apprehension (Loefstedt 1993). Led by various environmental groups, the Swedish people decided in 1980 via a referendum to phase out the use of nuclear energy by the year 2010. The greenhouse issue rose to prominence in Sweden a few years later and received even more publicity in 1988, largely as a result of an extremely hot, dry summer in North America.

Concern over the greenhouse issue was compounded by recognition of the country's potential vulnerability to the effects of climate change. Warmer temperatures could have serious implications for Sweden, particularly in the Baltic area. Rising sea level, warmer water temperatures, a reduction in the sea's salinity could make certain areas of the country uninhabitable and weaken important sectors of the economy. Scientists estimate that inflow of fresh water from Sweden to the Baltic Sea could change by the order of 20 percent, which in turn would have serious consequences for marine ecosystems. Sea level rise would also cause serious erosion along the south coast of the Baltic, and nitrogen from flooded areas along the coast could flow

into the sea, upsetting the ecological balance, resulting in loss of species. Warmer water temperatures could change the composition of marine organisms, causing declines in fish populations, which in turn would affect the Swedish fishing industry. Global warming could also affect patterns of air movement, bringing air pollution from other parts of Europe to Sweden (Swedish Ministry of the Environment and Natural Resources 1994A). After its experience with sulphur dioxide in the 1970s and 80s and the Chernobyl accident in 1986, Sweden is particularly sensitive to the potential problems of transboundary air pollution. Thus, in contrast to the U.S. and other countries, the Swedish government acknowledged that the global change issue must be confronted. The question was, how should Sweden reduce emissions of greenhouse gases without relying more heavily on nuclear power, the main alternative to fossil energy?

The *Riksdag* swiftly announced the national policy on climate change in 1988. The force behind the decision was an alliance between the Center Party and environmental groups pushing for renewable energy production on the one hand, and the Conservative Party and other groups advocating nuclear power on the other hand. Only the Social Democratic Party, which at that time had a minority position in the government, voted against a CO₂ stabilization plan. The broad goal of the government was to stabilize greenhouse gas emissions at 1988 levels by the year 2000. To accomplish this, parliament initiated a climate change strategy consisting of two major elements: 1) a national energy strategy aimed at reducing emissions of CO₂, and 2) a carbon tax designed to reduce demand for fossil fuels.

The global climate change issue also marked the beginning of a new era in Swedish environmental policy making, in that for the first time fiscal incentives were used as the primary policy incentives. While economic instruments had been introduced in the environmental policy arena in the 1970s, their use was limited, and until the late 1980s, Sweden relied mainly on command measures for pollution abatement. The most significant such measures were the Environmental Protection Act of 1969 and the Act on Chemical Products. The former regulated emissions of harmful substances from point sources, while the latter was introduced in 1985 to control the emissions of chemical products and other substances posing a threat to human health and/or the environment (Swedish Ministry of the Environment 1991). By the late 1980s, however, emissions from smaller, diffuse sources were increasing, a trend that would require different types of policy measures, since regulations alone did not offer polluters sufficient incentive to reduce emissions. Economic instruments were seen as an option which could provide this incentive (Swedish Ministry of the Environment 1991).

The need to update traditional environmental policy measures and the need to overhaul existing tax policies motivated the government to propose a new tax on carbon dioxide in 1988. Many Swedes--both private citizens and industrial concerns--had argued for years that national

income and energy taxes were too high. In addition, the business sector had long complained that taxes on exports put Swedish industries at a competitive disadvantage and might force Swedish companies to move abroad, where rates were more favorable (Bohm 1994). Tax reform was regarded by many as the most appropriate means of responding to these concerns.

Because Sweden is a small country where members of parliament, industry, and NGOs often know each other, lobbying is done very informally through personal networks. Unlike the U.S. system, where professional lobbying organizations often play a major role in networking between government and special interests and frequently make significant contributions to the campaign funds of political candidates, the Swedish system is much less structured, and Swedes are forbidden by law to make financial donations to candidates. This informal system of networking is facetiously referred to as "brotherhood corruption." Both business and environmental groups employed it to influence the government stance on the global warming policy debate.

Business argued that Sweden should not impose a carbon tax until other European countries had also done so. Since nearly half of Swedish industrial production is exported to Europe, industry feared losing its competitive edge. One of the major participants in this debate was the Federation of Swedish Industries (Svenska Industriefoerbundet), an umbrella organization for manufacturing groups. This organization, along with various other industrial groups, lobbied parliament to reject the carbon tax.

Predictably, environmental groups took the opposite position. They lobbied parliament on behalf of a carbon tax and received strong support from the Center and Left parties. In a society which is accustomed to high levels of taxation, the notion of a carbon tax was not strongly opposed by the *Riksdag*, especially since a majority of Swedish parliamentarians come from public sector, as opposed to business sector, backgrounds. In the end, the *Riksdag* revised the tax system, reducing income taxes, broadening the VAT to apply to all forms of energy, and adding CO₂ and sulphur dioxide taxes. However, as we shall see, some concessions were made to industry.

The carbon dioxide tax, which went into effect on January 1, 1991, was applied to all fossil fuels except when they are used in the production of electricity. Thus about 25 percent of Swedish CO₂ emissions are exempted from taxation (OECD 1992). The carbon dioxide tax is calculated on the basis of both the average carbon content of the fuel and the caloric content (Swedish Ministry of the Environment 1991). Because of pressures from industrial groups, however, tax burdens on industry were minimized. The 1991 tax law put a ceiling on the total amount of energy taxes to be paid by each company. During 1991 the ceiling was 1.7 percent of the value of manufactured products; between 1992 and 1994 the rate was lowered to 1.2 percent (OECD 1994A). As a result of these concessions, energy-intensive industries such as cement, pulp and paper, iron and steel, and chemicals, were protected from high taxes. Similarly, there is

a cap of 15 percent of the combined tax on energy and CO₂ for commercial horticulture using energy to heat greenhouses (Bohm 1994). As a result of further tax reform in 1993, however, this loophole will be closed in 1996, when all branches of the manufacturing sector will be subject to uniform carbon taxation (Swedish Ministry of the Environment 1994). It is also noteworthy that tax rates on electricity also vary between regions in Sweden, owing to differences in regional policy. For example, the tax rate on non-industrial uses is lower for certain parts of northern and northwestern Sweden (Bohm 1994).

The Swedish Ministry of the Environment projected that the carbon tax would reduce carbon emissions by 5-10 million tons by the turn of the century and would transfer approximately 18,000 million SEK (\$2.7 billion) from income tax to various types of energy and environmental taxes (Swedish Ministry of the Environment 1991).

The second element of Sweden's pre-Rio climate change policy was its national energy strategy. In 1991 the *Riksdag* passed its "Interparty Agreement on Energy Policy," which called for increased energy conservation and "environmentally adapted energy production," i.e., energy production using fuel sources that have little impact on climate change.⁴ According to the agreement, energy conservation is to be realized through the use of energy-efficient technologies, demonstration projects in residential, commercial, and industrial premises, pilot installations, and advice to small and medium-sized industries on how to enhance energy efficiency. The energy policy also encouraged the use of renewables by offering investment grants to facilities that utilize renewable energy sources, such as wind power, solar energy, and bio-fuelled combined heat and power (CHP- cogeneration). The agreement further stated that, if fossil fuels must be used, then natural gas should be given preference over oil and coal, and CHP should to be given preference over condensing power. CHP is further exempt from energy tax on fuel (Government of Sweden 1991).

As part of its energy strategy, the Swedish government also launched an ambitious program of research and development. The 1990 Energy Research Bill had three fundamental goals: to establish fundamental competence and expertise; to facilitate the changeover of the country's energy system to allow the phase-out of nuclear power; and to establish greater awareness of the effects of energy systems on climate and the environment. Total funding for this program amounted to SEK 343.8 million (\$12 million) in 1990/91. The budget supported R&D on energy

⁴ Since the signing of the Rio Framework Convention in 1992, the Swedish parliament has decided to revisit its energy policy. Currently it is under review by a special energy commission, and it remains to be seen if any revisions will be made.

supply (with special emphasis on renewables), energy technology in industry, transportation research, as well as 16 million (\$1.8 million) for research on environment and climate (Government of Sweden 1991).

Further evidence of the seriousness with which Sweden regarded the climate change issue is the fact that at the ministerial conference at Noordwijk in the Netherlands in 1989, Sweden was one of the nations arguing for protocols containing specific commitments to reduce CO₂ emissions. This stance was opposed by the United States and ultimately defeated in the final Framework Convention on Climate Change.

The United States

The United States is an example of a market/individualist decision-making culture. In this type of system, emphasis is placed on maximizing quality of life at the individual level, and a free market is believed to be the best mechanism to ensure that personal success is achieved. In addition, market cultures believe that technology and innovation hold the answers for many of the problems faced by society.

The market orientation of the United States can be traced to the country's early development. The U.S. had its origins in the struggle against autocratic rule in the 17th and 18th centuries; hence there was no tradition of nobility or peerage. Instead, the nation's development was based upon the rights of the individual, as evidenced by the U.S. Constitution's Bill of Rights, which guarantees certain freedoms to all people and limits the power of the state to interfere in the affairs of the private citizen. What's more, the U.S. rose to prominence during the industrial revolution, when the primary emphasis was on industry and commerce.

In contrast to the situation in many other nations, the individual in American society takes large responsibility for his own well-being and resents government attempts to restrict his freedom or his ability to make choices. Perhaps the French historian Alexis de Tocqueville described this American individualism best when he said, "In all matters concerning himself, alone he [the individual] remains the master; he is free and owes an account of his actions to God alone. From this derives the maxim that the individual is the best and only judge of his own interest and that society has no right to direct his behavior unless it feels harmed by him or unless it needs his concurrence" (de Tocqueville 1835).

The U.S. approach to health care is typical of the market culture: American citizens have a wide range of choices in health care coverage, though they must pay for a large share of their health care costs themselves, unlike in egalitarian cultures, where access to free or low cost health care is guaranteed to all. In addition, health care prices in the U.S. are mostly determined according to market principles of supply and demand. Although efforts have been underway to

transform the system into a more egalitarian one that covers the millions of Americans currently not eligible for coverage under company insurance plans, citizens and organizations in the U.S. have offered vigorous (and so far quite successful) resistance to such change, fearing that it may impinge on their freedom of choice or that they personally may have to bear a larger share of the burden in the form of taxes. Their arguments resonate with the market-oriented public.

The U.S. approach to the climate change issue was nearly the opposite of Sweden's. While Sweden did not begin to seriously discuss policy options until fairly late (1988), the U.S. had discussed global warming in a policy context as early as the late 1970s, when then-President Jimmy Carter recognized that CO₂ emissions could have some bearing on U.S. energy policy (Hecht and Tirpak 1994). And while Sweden, once confronted with the problem, moved quickly on the issue, the United States took a cautious approach and was slow to respond with substantive policy measures. This is because many elements of the society believed that aggressive climate change policies could upset the U.S. economic structure, forcing major changes in industrial processes and in American lifestyles. In addition, the contentious nature of the policy debate, in which many opposing views were put on the table, precluded the formulation of any drastic policy measures. Thus, the major policy instruments were research and, to a lesser extent, voluntary measures.

Although the U.S. scientific community had discussed the phenomenon of climate change since the late 1950s, public interest in the issue didn't develop until the 1980s, when a series of weather phenomena, including severe droughts in Africa, Asia, and especially North America, brought the issue to national attention. In addition, scientists in 1985 attributed a hole in the ozone layer over Antarctica to anthropogenic sources, suggesting to many people the impact of human activities on the global environment. 1988 was the crucial year for climate change as a serious policy issue. A severe drought that summer devastated crops in the Midwest and caused many people to consider the possibility that global warming may in fact be a real phenomenon; policy makers began to devote more attention to the issue.

The U.S. policy-making process is characterized by its transparency. The system allows interested parties to make their views known on important policy questions. The debate on climate change saw a great deal of stakeholder activity. In 1989 there were 40 days of Congressional hearings on the subject of global warming (Dickson 1994). Testimony was heard from scientific experts, government officials, nongovernmental organizations (NGOs), and industry groups.

No discussion of the U.S. decision-making system is complete without mention of the powerful role played by industry lobbies and other pressure groups. Nearly every industry and special interest in the United States is backed by a trade association or foundation with an office in Washington that can exert a great deal of influence on the policy-making process. These groups,

well-financed by their members, are highly specialized and usually have strong contacts within Congress and/or the Executive Branch. This inside connection helps ensure that their views will be heard when important policy issues come up for discussion on Capitol Hill. A primary strategy of these organizations is to make donations to the campaign funds of elected officials, thereby putting the candidate under tacit obligation to give special consideration to that group's interest. In 1990, for example, political action committees (PACs) contributed over \$108.5 million to the coffers of U.S. legislators (U.S. Department of Commerce 1993). Not only do special interest groups have access to Congress, but they can also delay the policy making process by demanding further hearings and threatening litigation.

With respect to the global warming issue, industry and its supporters opposed policy measures, such as new regulations and CO₂ taxes, that they felt could reduce profit margins. During the late 1980s, such groups lobbied Congress to reject radical measures that could weaken the competitiveness of U.S. industry. They also initiated information campaigns to influence media and public opinion, arguing that predictions of climate change were exaggerated. As policy measures they tended to favor such non-controversial options as research and tree-planting (Dickson 1994). President George Bush adopted a similarly noncommittal approach to the climate change issue, supporting industry's claim that stringent emissions reductions action would harm the competitiveness of U.S. firms and put Americans out of work (Newton 1993).

Environmental groups, on the other hand, were for the most part critical of the U.S. inertia on the global warming problem and argued that more aggressive strategies and commitments were in order. In addition to advocating reduced deforestation, these organizations also supported increased energy efficiency and greater reliance on renewable energy sources. Many of the U.S. NGOs employed competent scientists who were able to conduct their own calculations of the climate change; they also developed policy recommendations that they offered to Congress. In addition, these groups worked diligently to promote public awareness of the global warming issue.

The U.S. natural and social science community also played a major role in influencing policy decisions. Using sophisticated computer models, scientists contributed to the policy debate by attempting to project the actual likelihood of global warming and its potential economic impacts. The most famous testimony was given by Dr. James Hansen of NASA before the Senate Energy Committee in June of 1988. At the time of his appearance, temperatures across a large part of the United States were nearly 100 degrees F, and a major drought was sweeping the agricultural states of the Midwest. Hansen declared that he was "99 percent confident" that global warming was related to the greenhouse effect (Newton 1993). Taking the opposite view was the Marshall Institute, a Washington think tank, which issued a report in 1990 indicating that policy responses to climate change were unjustified on the grounds that computer models are inaccurate.

The Institute further claimed that improved computer modeling would make it possible to provide answers to any climate threats within five years (George C. Marshall Institute 1990).

A similar polarization occurred among economists studying the results of detailed economic models, which were also a cornerstone of the U.S. global change debate. "Adaptationists" argued that society could adapt to changing environmental conditions through new technologies and other social advances. William Nordhaus, one of the main proponents of this view, concluded through his computer models that climate change caused by increased levels of CO₂ would have only a minor impact on the U.S. economy--about one-fourth of one percent of national income--*ergo*, dramatic CO₂ reduction strategies could prove unnecessarily costly. According to Nordhaus, "climate change is likely to produce a combination of gains and losses with no strong presumption of substantial net economic losses" (Nordhaus 1991).

"Mitigationists," on the other hand, argued that the threat of global warming was very serious indeed and that it would be necessary to take steps to reduce the emissions of greenhouse gases, since the risk of global warming is much greater than the costs required to control CO₂ emissions. Prominent proponents of the mitigationist viewpoint included William Cline of the Institute for Energy Economics and Irving Mintzer of the University of Maryland (Morisette 1992).⁵

Government agencies also participated in the global warming debate, adding their perspectives to the already fractious policy-making process. During the Bush Administration, which was in power when the climate change issue reached its peak just before the Rio Convention, the Environmental Protection Agency (EPA), under the leadership of William K. Reilly, argued on behalf of aggressive CO₂ reduction strategies. Some representatives of the Executive branch, including President Bush, members of his staff, and officials from the Office of Management and Budget, on the other hand, took the view that there was insufficient evidence on the reality climate change to warrant imposition of any drastic new GHG reduction policies. This debate often turned ugly, with members of the Administration publicly sniping at one another (Andresen 1993).

One important outcome of the interagency disagreement, however, was the U.S. support for the Intergovernmental Panel on Climate Change (IPCC), an international panel of experts appointed to conduct a scientific assessment of the climate change issue. Representatives of various federal agencies in the U.S., including the State Department and the EPA, argued on behalf of an

⁵ For a more detailed discussion of the U.S. economics-based approach to global warming, see William R. Cline. 1992. *The Economics of Global Warming*.

international convention on climate change and regarded an international scientific assessment as a necessary precursor to such an agreement. Meanwhile, officials from other agencies viewed an assessment as a way to buy time, thereby avoiding the creation of policy measures against the uncertainty of climate change. In the end both sides supported the creation of the IPCC--though for very different reasons (Hecht and Tirpak 1994).

The market-based orientation of U.S. society is also apparent in the way in which the climate change debate was framed. Whereas in the Swedish case, the global warming issue was set in the context of a national debate around nuclear power and its safety risks for the entire society, the global warming discussion in the U.S. was viewed in heavily economic terms. As mentioned above, much of the global warming discussion in the United States revolved around the use of econometric models to ascertain the potential costs of reducing greenhouse warming. The cost-benefit ("top-down") approach is common in the U.S. when it comes to making important social decisions. Policies must be justified by a detailed assessment of any potential impacts on the economy and on how the proposed new measure will be valued by citizens before governments will commit to it. Implicit in the cost-benefit strategy is the assumption that costs and benefits are valued according to how the affected individuals would value them (Bayer 1994). This individualistic focus on economic indicators over energy demand contrasts sharply to the modeling emphases in other countries, particularly those in Germany and Sweden, where most government-supported models are based on the technology-oriented "bottom-up" approach. The bottom-up approach focuses most heavily on the technological aspects of attaining strict CO₂ reduction targets with less attention to the costs; net losses to GDP do not figure in nearly as prominently in those countries as they do in the U.S.

Not only did the debate in the U.S. focus on the economic aspects of climate change, but it also was influenced heavily by powerful interests--such as the oil and gas lobbies--which stood to lose from changes in existing policy. While some non-governmental organizations tried to call attention to the negative impacts climate change could have on the powerless, the U.S. policy debate virtually ignored a serious discussion of social risk.

Owing to this reluctance to implement forceful GHG reduction strategies having economic impacts, the U.S. adopted a "no regrets" approach to global warming. The no regrets approach was based on the argument that too little was known about the global warming problem to warrant significant CO₂ reductions, but that some non-controversial actions, such as planting trees and enhancing energy efficiency, should nonetheless be undertaken so that, regardless of whether or not global warming proved to be a reality, no one would regret having taken those actions (Andresen 1993; Reinstein 1993). This approach was criticized by other countries on the grounds that

it represented a time-buying tactic through which the U.S. could put off indefinitely taking potentially painful measures to reduce carbon dioxide emissions.

U.S. policy makers also took the view that greenhouse gas emissions can be reduced through development and transfer of environmental technologies and more efficient use of energy (Hecht and Tirpak 1994). Research and development were the U.S.' primary policy instruments in its greenhouse gas abatement strategy. Research would be conducted both on technological solutions to CO₂ emissions and on the phenomena of global warming itself. Between 1989 and 1990 alone, Congress increased funding for focused climate change research by 43 percent (USGCRP 1989).⁶ By 1992 total U.S. expenditures for global change research amounted to \$1.18 billion (USGCRP 1992).

In 1993, President Clinton reinforced U.S. emphasis on technological solutions in the introduction to his Climate Change Action Plan: "This [commitment to reducing CO₂ emissions] must be a clarion call, not for more bureaucracy or regulation or unnecessary costs, but instead for American ingenuity and creativity to produce the best and most energy-efficient technology" (Clinton and Gore 1993). Central to this Plan has been cooperation between government and industry to stimulate technology development in the private sector. The Plan contains over 50 government-industry actions designed to reduce emissions of CO₂.

U.S. refusal to implement strong policy measures at home was accompanied by its refusal to commit to such policies internationally as well. At a conference in Toronto in June of 1988, a bloc of smaller countries called for a reduction in carbon dioxide emissions by 20% of 1988 levels by 2005. However, the United States, along with the Soviet Union, China, and Japan, blocked this proposed measure, since together these four countries accounted for nearly one-half of all CO₂ emissions, and it was felt that such a stringent commitment would harm their economies. The next year at the ministerial conference in Noordwijk in the Netherlands, the U.S. again refused to adopt targets and timetables for reducing CO₂ emissions. Thus, although awareness of the global warming problem was high in the U.S., substantive policy actions were slow to materialize.

In 1990 Congress passed the Clean Air Act Amendments (CAAA), an update of the 1970 Clean Air Act. Though not specifically designed to reduce greenhouse gas emissions, certain provisions of the CAAA would nonetheless have the result of lowering emissions. The Act introduced regulations to limit air pollution from power plants, vehicles, and industry and to reduce

⁶ Focused research is research conducted specifically on the the issue of climate change. This figure does not include funding for "contributing research," or research having the potential to contribute to climate change research but not designed expressly for that purpose.

emission of greenhouse gases and their precursors, such as volatile organic chemicals, sulphur dioxide, and nitrogen oxides. The debate on this bill was marked by hundreds of hours of debate on Capitol Hill as consumers, utilities, and industry described to Congress how the new law would affect them. Steelmakers, for example, complained that certain provisions of the CAAA eliminating virtually all emissions from coke ovens by 2020 would cost the industry about \$5 billion. Such a requirement, they argued, could result in the loss of thousands of jobs. Likewise, major Midwestern utilities complained that the revised Clean Air Act would force them to raise rates for electricity (Wald 1990). Again, much of the debate was framed in terms of potential economic losses to sectoral interests.

Congress also passed a new energy policy in 1992. It too contained some provisions designed to reduce carbon dioxide emissions, though like the CAAA, emissions reductions were not the primary focus of the legislation. This energy policy was codified in the 1992 Energy Policy Act (EPACT), which was the legislative component of President Bush's National Energy Strategy of 1991.⁷ The Act called for increased energy efficiency and energy conservation. It further encouraged the development and commercialization of renewable energy technologies. In terms of specific policy instruments, EPACT consisted of the "carrot" rather than the "stick" approach. It introduced few new regulations and provided no penalties for breaking the law, calling instead for tax credits, tax relief, subsidies, and increased research and development (Eikeland 1993). For example, EPACT provided tax credits for electricity produced by wind and biomass facilities; it extended the tax credit qualifying periods on non-conventional fuels, including synfuels from coal and gas from biomass; and it authorized a major demonstration program aimed at accelerating commercial application of renewable energy technologies (OECD 1993). EPACT further required the Secretary of Energy to establish a national inventory of greenhouse gases and to oversee the voluntary reporting of greenhouse gas emissions of industry. In addition, the Act also called for the establishment of a global climate change response fund, the purpose of which would be to facilitate U.S. contributions to international global change mitigation efforts (Eikeland 1993).

When it came time to negotiate the Rio Framework Agreement on Climate Change, the U.S. insisted that the Convention be modified to remove timetables and targets because of concerns regarding industrial competitiveness. In addition, the U.S. succeeded in getting the "comprehensive approach" included in the agreement. The comprehensive approach gives credit and

⁷ Though EPACT was passed in November 1992, after the Rio summit, negotiations on its content began long before. It can therefore be considered among the "pre-Rio" policy initiatives.

responsibility for reductions of all greenhouse gases--not just CO₂--so that the U.S.' phase-out of chlorofluorocarbons as part of the Montreal Protocol would also be considered.

Japan

Japanese society is dominated primarily by hierarchical elements. The country has a long tradition of top-down organization dating back to over a thousand years ago, when Japan was ruled by feudal lords who controlled the peasants and owed allegiance to the Emperor. Even during these times, Japan had a very sophisticated system of bureaucracy and public administration which enabled rulers to control their lands and collect tax revenues. The hierarchical structure of the society can still be seen today in the deferent attitudes of the people toward authority and by the fact that it is customary to defer to person of greater age or of higher social position. This rigid social structure is even reflected in the language, which makes distinctions in the social standing of the person speaking in relation to the person addressed (Hampden-Turner and Trompenaars 1993).

Many experts on the Japanese policymaking system concur that Japan is dominated by an elitist triumvirate consisting of the professional bureaucracy, the leading political party (until recently the Liberal Democratic Party), and leaders of big business. These three groups share the same social, economic, and educational, and ideological backgrounds and are usually united in goals and action. Because of these similarities, moreover, there is much interaction among the three groups, and they are able to control the decision-making process to the exclusion of outside individuals and groups, though outsiders are often allowed to participate in largely symbolic roles (Peterson and Wade 1985). Because of this closed, top-down system of governance, policy makers in Japan generally wield greater power than do their counterparts in other countries, including the U.S. and Sweden.

There is a seeming paradox in that, while Japan has a very hierarchical power structure, the Japanese pride themselves on the egalitarian nature of their society, which emphasizes the importance of national consent in addressing major social issues. While it is true that agreement on many aspects of public behavior is the norm, this consensus often derives from social pressure to conform. The Japanese disparage strongly individualistic behavior, and people are expected to adapt their attitudes and behaviors to those of the larger society. The government often plays a role in shaping public opinion. Thus, egalitarian tendencies are influenced to a large extent by hierarchical elements.

The Japanese research system is characteristic of a hierarchy. It is based on centralized R&D guidelines, which are put forth every few years by the Japanese Council for Science and Technology, consisting of the Prime Minister and ten other members. This body articulates an

overarching science and technology policy, spelled out in *The General Guidelines for Science and Technology*. This document establishes the basic principles to which all government agencies must adhere in developing their individual R&D programs. The various ministries and agencies have some latitude in implementing the policy, but they are still required to meet the objectives of the national plan (Anderson 1991). This system contrasts to that of, for example, the United States, which has fourteen individual Departments as well as several mission agencies, each having its own internally-developed research agenda and budget. While the U.S. research enterprise has begun to resemble Japan's in recent years with the creation of the National Science and Technology Council, the U.S. system is much less centralized than Japan's in terms policy development.

We have seen that Sweden undertook aggressive measures at home to combat the threat of climate change, and that the U.S., while becoming aware of the problem early on and devoting substantial public attention and financial resources to it, nonetheless took a conservative approach to implementing climate change policies. Like Sweden, Japan was late in picking up on the policy side of the climate change issue at home, and like the United States, its response was cautious.

Japan has the second largest economy in the world, and it is the fourth-largest consumer of energy. Although it is one of the most energy-efficient countries in the world, its production of greenhouse gases is still high at 2.97 million metric tons of CO₂ in 1991 (Marland et al 1994). In spite of a high level of CO₂ emissions, climate change did not receive much attention in Japan until the late 1980s. There were two reasons for this lack of action. The first was that there was no one behind the issue to push it to the forefront of the national agenda; neither government, NGOs, nor the scientific community devoted much attention to climate change until shortly before the Convention was signed in 1992. The second reason was that Japan was hesitant to act alone on the climate change issue.

The environmental movement in Japan is particularly weak, for a variety of reasons. There are few environmental organizations, and those that do exist concern themselves primarily with local and regional problems rather than with global issues. For example, Japan's small environmental movement focuses mainly on the risks associated with nuclear power, and since the 1970s these groups have led opposition to the construction of nuclear power plants near major cities. The problems of nuclear waste management are much more immediate to the Japanese than the more abstract notion of global warming. As in the case of Sweden, this attitude posed a dilemma for those who would take up the cause of global warming, since by opposing nuclear power, environmental groups would thus also be opposing one of the primary means to reduce emissions of greenhouse gases. Because the Japanese policy-making process is so closed, moreover, it is difficult for stakeholder groups to have much influence on politicians, although there do

exist some advisory committees that provide input on policy decisions to the government (Fermann 1992).

Like the environmental groups, the Japanese scientific community has tended to concentrate most of its resources on ground level air pollution and has traditionally not involved itself much with global issues, although some climate change research was conducted on a small scale at various Japanese research institutions. Government agencies were similarly detached from the global warming problem. An Environment Agency does exist in Japan, but this body was caught up in dealing with a rapidly growing caseload of domestic pollution problems and was unable to devote much attention to global issues during the years when climate change was emerging as a major international issue (Schreurs 1994). The Japanese Environment Agency, established only in the early 1970s, was also quite weak in comparison with other government bodies, such as the Ministry of International Trade and Industry (MITI) and other ministries.

The second reason for Japanese inaction on the climate change issue was that the government believed that Japan had already made a significant contribution to reducing global CO₂ emissions, since its energy efficiency level was already very high compared to other nations. By taking strong unilateral measures on the climate change issue, therefore, critics argued that Japan would be at a disadvantage relative to other countries. Consequently, the government postulated that Japanese action in the greenhouse issue would have to take place in the context of international activity. Policy makers argued that countries with the highest CO₂ emissions levels (e.g., the United States) should bear the greatest burdens for reduction. Only in such a way would responsibility for solving global problems be managed fairly (interview with C. Watanabe).

A change occurred around 1988, mainly as a result of international pressures. Japanese leaders had long been sensitive to criticism from abroad that Japan aggressively pursued its own interests--primarily economic--while neglecting its international responsibilities (Weidner 1993). Government representatives were thus eager to promote a new image of the country as a world leader in the area of environmental protection. Japan's bureaucracies, once realizing that global warming was fast becoming a highly visible policy issue, moved quickly to establish global environmental offices through which they could influence policy (Schreurs 1994).

In spite of an upgrade in status for climate change, efforts by the Environment Agency to introduce policies aimed at reducing carbon emissions were initially hindered by MITI's and industry executives' concern that policy actions to reduce carbon emissions might hamper economic growth and competitiveness. Japan's fears in this regard echoed those of the U.S. and Swedish business communities. A political battle ensued between MITI and the Environment Agency. MITI advocated energy conservation, transfer of energy technology, and R&D on new technolo-

gies, while the Environment Agency argued on behalf of international cooperation and CO₂ reduction targets.

Because of MITI's dominance of the debate, Japan at first resisted international pressures to sign onto an international climate change agreement, and along with the United States and a handful of other industrialized countries, opposed the establishment of a world climate fund which was proposed in May of 1989. At the 1989 Ministerial Conference on Atmospheric Pollution and Climatic Change, Japan and its allies (including the U.S.) refused immediate policy action and instead proposed that more research be conducted.

Finally, after months of negotiations between MITI and the Environment Agency, Japan announced a plan to stabilize per capita carbon dioxide emissions by 2000. This was done in June of 1990 at the Second World Climate Congress in Geneva. The *Action Plan to Address Global Warming* represented the basis for Japanese global warming policy and outlined a series of actions to be taken by the government and private sector in order to achieve desired CO₂ targets. Because the government believes in the public nature of environmental protection, it assumed primary responsibility for developing a comprehensive response to climate change and for inducing changes in behavior from the various sectors of the society (interview with C. Watanabe). Four national targets for greenhouse gas emissions are outlined in the Plan: 1) stabilization of CO₂ emissions on a per capita basis by 2000 and beyond at 1990 levels; 2) stabilization of total CO₂ emissions in 2000 and beyond at about the same level as in 1990; 3) ensuring that CH₄ emissions do not exceed 1990 levels; 4) ensuring that N₂O and other GHG emissions do not increase (OECD 1994B). Though the Plan aims for stabilization of emissions by 2000, it must be noted that this target is actually quite modest, since it allows for a 6 percent increase in emissions between 1990 and 2000. The fact that CO₂ emissions had jumped 30 percent between 1987 and 1990 made the commitment even less stringent, as it used a base year with high per capita emissions. In addition, the commitment was adopted through a government decision and never made into law by the Japanese parliament, which weakened it even more (Fermann 1994).

The *Action Plan* relies heavily on such financial incentives as subsidies, tax breaks, and zero or low interest loans. Broad in scope, it calls for a restructuring of several levels of Japanese society, including the transport system, urban and regional structures, production structures, energy supply structures, and the "realization of lifestyles" (Tanabe and Grubb 1991).

With regard to the energy supply sector, the Plan advocates improvements in energy efficiency and energy conservation measures as well as the use of energy sources having low or no CO₂ emissions (e.g., substitution of fossil fuels with nuclear energy). It calls for the promotion of nuclear energy, taxation policies favoring investment in renewable energy sources, and subsidies to local city gas suppliers to convert to natural gas. It likewise contains measures to

enhance CO₂ sinks; to increase research and monitoring of global warming; to develop and disseminate technology related to energy conservation and renewable energy sources and on technology to improve CO₂ emissions control and techniques for the disposal of CO₂; to promote public awareness of the global warming issue; and to promote international cooperation on climate change activities. It further encourages each of Japan's ministries to develop climate change mitigation strategies for their particular sphere of interest (OECD 1994A and OECD 1994B). It is noteworthy that Japan chose not to adopt CO₂ taxes, owing to industrial and government concerns that such a tax may slow economic growth (Fermann 1994).

Another pillar of the Japanese response to the global warming question has been research and development. Both government and industry believed that technology is an important means by which the country could realize further reduction in CO₂ emissions (Tanabe and Grubb 1991). The Japanese government has traditionally put a great deal of emphasis on the role of technological innovation in responding to various social, environmental and economic challenges. This is evidenced by the industrial policies that have been initiated by the Japanese government as far back as the early post-war years (Watanabe 1994). For example, in response to changing economic conditions and serious pollution problems in the 1960s, MITI in 1971 announced a new plan for Japan's industrial development. This plan, called "MITI's Vision for the 1970s," advocated a knowledge-intensive industrial structure calling for innovative research and development aimed at reducing dependence on materials and energy in production processes and consumption (Watanabe 1994). Other comprehensive government R&D programs have included the Sunshine Project on R&D on new energy technologies, (1974) and the Moonlight Project on energy conservation R&D (1978). In the 1970s, moreover, Japan reduced emissions of sulphur dioxide and nitrogen oxide (NO_x) by improving energy efficiency and emissions control through the introduction of myriad new technologies, such as direct heavy oil desulphurization facilities, gas desulphurization facilities, and improved methods of emissions control. Consequently, atmospheric SO₂ density has decreased by one-sixth over the last twenty-five years (Watanabe 1994).

With respect to the climate change issue, technology again became an important aspect of the Japanese response. At the end of 1992 MITI combined the Sunshine Project, the Moonlight Project, and its Global Environmental Technology Program, which it had established in 1989, to create a New Sunshine Program. The goal of this program was to reduce energy-related CO₂ emissions by 16 percent by 2010 and by 50 percent by 2030 over 1990 levels. The budget for this program for 1993 was 50 billion yen. It consisted of three main components: an innovative R&D program focused on technology to limit global warming; an international collaboration program on large projects aimed at such technologies as hydrogen conversion, low NO_x lean-burn engines, and CO₂ fixation, absorption, and storage; and a cooperative R&D program to assist

developing countries respond to energy and environmental problems (OECD 1994B). Another product of Japan's preference for technological solutions was the establishment in 1990 of the Research Institute of Innovative Technology for the Earth (RITE), which seeks to develop "a new system of industrial technology based on the perspective of harmony with the environment . . ." (RITE 1990). The main goals of the Institute are to diffuse environment-friendly and energy-related technologies and to develop innovative technologies for the preservation of the environment (RITE 1990).

The Japanese government's involvement on the climate change issue was followed by interest in the private sector as well. Since 1990 many of Japan's largest companies have established global environment offices and have invested in global environmental technologies. A 1991 survey revealed that 80 percent of Japan's major manufacturing and construction companies were investing in R&D on global environmental technologies (Schreurs 1994). In addition, the Japanese Federation of Economic Industries (Keidanren), the most influential industrial organization, announced its own voluntary program to address the climate change issue in 1991.

IV. Analysis of Cultural Theory as a Predictive Instrument

We have seen how the U.S., Sweden, and Japan responded to the threat of global warming. To what degree did these actions correspond to the projections of cultural theory?

The Global Commons Question. How did the three countries view their role in managing the global commons? One would expect that an egalitarian culture would take an aggressive approach to environmental problems owing to a concern for the welfare of future generations. Of the three countries analyzed here, Sweden was in fact the most willing to take action on the climate change issue and to call for changes in behavior (in the form of energy taxes).

A market culture would be expected to be less interested in global issues for their own sake, but would be willing to act if it is not overly expensive to do so. What's more, market cultures view environmental risk as a legitimate cost of the entrepreneurial way of life. The United States behaved in a way that was consistent with this projection, as it refused to heed international calls for commitments on global warming (though it must be noted that some elements of U.S. society were in favor of action, but attaining the necessary consensus was virtually impossible). The calculation of risk can be seen in the U.S.' extensive use of econometric models to rationalize policy decisions. In the end, the U.S. refused to commit to substantive policy measures, owing to uncertainty about the nature of the problem and the potential economic costs of various abatement strategies. This reluctance to act may also be a function of the market culture's short-term, present-oriented approach.

Hierarchies believe that environmental problems can be addressed through centralized government intervention aimed at coordinating economic and environmental objectives. Because hierarchies are inherently risk-averse, moreover, one expects caution in responding to environmental threats. Japan did react cautiously and was among the last of the major developed nations to make a commitment toward stabilizing emissions of greenhouse gases. The Japanese response consisted of a major centrally-directed national CO₂ reduction strategy.

The Policy Making and Implementation Process. The second test of cultural theory is whether or not the theory can project the process by which policy is formulated in a given country. In the case of egalitarian cultures, one expects that there will be considerable debate among various groups as the society struggles to achieve consensus on major issues. A wide range of views will be represented with emphasis on eventual compromise. Debate, based on information-sharing, was indeed the order of the day in Sweden, with the country's largest environmental organizations arguing on behalf of a carbon tax on the one hand, and industry, represented by the Federation of Swedish Industries (SI), arguing against such measures, on the other hand. While conflict clearly existed, both sides eventually reached a compromise without the level of discord so apparent in the U.S. debate.

Cultural theory projects that consensus is extremely difficult to obtain in a market culture, and in the United States we have seen how various actors responded to the threat of climate change--each presenting a different set of goals and policy recommendations. The process was highly contentious, marked by long debates before Congress, within the scientific community, and in the press. Part of the reason for the U.S.' weak showing at various international conferences was that there was no agreement within society itself as to the seriousness of the problem or to the most appropriate solution. No side was willing to compromise, and in the end, economic (market) concerns took precedence over environmental concerns. This is consistent with what one might expect from a market culture, where a premium is placed on individual values and financial interests.

The process of global warming policy development in Japan was similarly consistent with what one would expect from cultural theory. Although there was some debate regarding the appropriateness of various proposed policy measures, most of this discussion took place within the government bureaucracy, and as we have seen, once the powerful Ministry of International Trade and Industry got behind the issue, substantial policy actions quickly followed. Though the Environment Agency was the first government body to stress the importance of CO₂ reduction policies, it wasn't until MITI realized the potential international significance of the issue that a national climate change policy was put into place. A top-down approach followed, with MITI designing policies affecting virtually every sector of the national economy.

Policy Instruments. The third test of cultural theory is its ability to project the choice of policy instruments. In an egalitarian society, one would expect to find a combination of information and regulation. In fact, however, Sweden responded to the climate change issue by introducing economic instruments in the form of a CO₂ tax to supplement existing regulations. By raising prices, the tax discouraged the use of fossil fuels. (This illustrates the strong market tendencies at work in Swedish society.) No new regulations were imposed. Information also played only a minor role as a policy instrument in Sweden prior to the signing of the Rio Agreement in 1992. However, in 1993 the Swedish government allocated SEK 5 million for climate-related information and education to increase the level of knowledge among the general public concerning the effects of climate change and to educate them on preventive measures and the importance of individual behavior (e.g., using public transportation, conserving electricity).

Owing to the individualist/market orientation ascribed to the United States by cultural theory, one would expect market mechanisms, such as tradeable permits and taxes incentives, as well as research and development, to be the primary policy instruments. Specifically, tax breaks, implicit subsidies designed to encourage behaviors by not taxing them, are likely to be most successful in market cultures, since in the U.S. the imposition of new taxes is usually vigorously opposed. A carbon tax that was proposed in 1987, for instance, was soundly rejected. Such a tax was similarly voted down again in 1993. Because Americans respond more favorably to incentives, EPACT and the subsequent U.S. *Climate Change Action Plan*, used them heavily.⁸ Such measures can also be introduced at relatively little cost. Research was also selected as the core of the U.S. national climate change strategy. Both Presidents Bush and Reagan advocated the need for additional research on the global warming issue and expressed confidence that new technologies would enable the country to respond effectively should the threat turn out to be real. Under George Bush, especially, the U.S. climate change budget increased substantially.

Cultural theory tells us hierarchies may be expected to favor a combination of command and fiscal policy instruments. Because their orientation is top-down, they are inclined to adopt command measures, but the pragmatic reality is that governments must ensure industrial cooperation, so they will also introduce market mechanisms to appease industry. In fact, many industrial leaders have great influence with MITI and were able to ensure that industry's concerns were

⁸ The Climate Change Action Plan (CCAP) also called for voluntary CO₂ reductions on the part of industry, thereby allowing firms maximum flexibility to devise innovative programs to achieve national goals. This is an interesting manifestation of the U.S.' market orientation. Because it wasn't drawn up until 1993, however, further discussion of the CCAP is beyond the scope of this paper.

heard in the global warming policy debate. This resulted in Japan's heavy reliance on fiscal measures, such as tax breaks and low interest loans, as the major policy instrument to reduce emissions of greenhouse gases. However, in defiance of cultural theory's projections, Japan did not rely much on regulation to bring about change. Instead the Japanese used a combination of fiscal measures and R&D.

Speed of Policy-Making and Implementation. The fourth test of cultural theory projects the speed with which policies are actually implemented. One would expect a great deal of variation between the three cultural types, with hierarchies and egalitarians moving quickly and market cultures moving slowly. Implementation of environmental policies in Sweden was in fact relatively swift. The *Riksdag* first debated the issue in 1988; the same year CO₂ reduction goals were established (though they were subsequently modified). Within three years a new CO₂ tax and a revised energy strategy designed to reduce CO₂ emissions were also in place.

In the U.S. by contrast, implementation was slow, mainly because there was no agreement regarding the appropriate policy measures and the level of effort and expenditure needed to enforce them. While some CO₂-reducing policies were introduced through the passage of the Clean Air Act Amendments and the Energy Policy Act of 1992, the global warming element of these initiatives was mostly coincidental. A substantive policy measure with real commitments was not introduced until October of 1993, several years after the debate on climate change had commenced. In addition, the U.S.' main policy instrument, research and development, faced additional challenges on Capitol Hill, as legislators, heavily influenced by interest groups, debated the U.S. budget for climate-related research.

Like Sweden, Japan moved quickly on the climate change issue. The *Action Plan* was drawn up within two years after the issue came to public attention. This is because decision-making was mainly at the government level, so there was little room for disagreement from outside parties, as was the case in the U.S. Once the government had decided to react, it could move freely to implement the policies necessary to respond to the global warming problem. Government agencies undertook measures to reduce greenhouse gases, enhance carbon sinks, accelerate scientific research, and disseminate appropriate technologies. Japan also began a program of urban tree planting and made improvements in transportation facilities to increase energy efficiency.

The Role of Technology. Does technology have a role in responding to environmental threats? If so, who within a society should lead the drive to innovate? According to cultural theory, an egalitarian culture will view environmental threats as sufficiently serious to warrant major behavioral changes and will not put much reliance on the development of new technologies to solve perceived problems. However, those technologies which are deployed originate not from

a large central bureaucracy, but rather from a host of disparate sources. Like the other two countries discussed in this paper, Sweden has an extensive climate change research program as well as various programs aimed at enhancing energy efficiency and developing alternative energy sources. In some areas of energy technology R&D, in fact, Sweden is a world leader. Most of these programs are sponsored by the national government. In this sense, Sweden did not act in accordance with cultural theory's projections, although in the mid-1990s there are virtually no industrialized countries which do not have substantial national research and development programs.

Market cultures will take a very positive view of technology. They believe that new advances in science and technology will overcome most potential threats to the environment. In the U.S., research and development were emphasized both as a means of reducing uncertainty about the global warming problem (recall the conclusion of the Marshall Institute report), and of reducing greenhouse gas emissions through the development of new environmental technologies. While government is heavily involved in funding research and technology development, much of the innovation actually takes place in the private sector, where the market guides industry's technology investment decisions. That the United States has historically refused to implement an industrial policy, whereby the government would decide which industries should be developed, further indicates U.S. commitment to laissez-faire capitalism and market principles.

Cultural theory implies that hierarchies will tend to regard environmental problems as serious but manageable through centralized government intervention. Such attitudes can indeed be ascribed to Japan, which through its centralized bureaucracy having its purest expression in MITI, developed a comprehensive, long-term plan for dealing with the climate change threat. Technology was viewed as having a major role in mitigating environmental threats. As we have seen, the Japanese response called for a large-scale, technology-based research and development program geared toward improvements in energy and environmental technologies. The impetus for innovation thus originated within the government bureaucracy.

Limitations of Cultural Theory. Thus far cultural theory has quite accurately projected countries' attitudes and behaviors in several key areas. However, it does have limitations. For example, Sweden's primary policy instrument vis a vis global warming was taxation, but the CO₂ tax levied contained many loopholes for industry. In this sense Sweden behaved much like a market culture. Similarly, the U.S. exhibited some very strong hierarchical tendencies, and the important role played by individual actors cannot be overlooked. President Bush's powerful Chief of Staff, John Sununu, for example, exerted a strong influence on the climate change policy process prior to Rio. Because he personally did not believe in the possibility of anthropogenic global warming, Sununu was able to undermine the efforts of other government officials, such as representatives from the EPA and DOE, who advocated a stronger climate change policy. When he

saw the EPA's first draft of U.S. climate policy which was to be presented to the IPCC, Sununu tore the document up and rewrote the document according to his own ideas. He also aggressively undercut individuals in the Administration whose views he felt were too sympathetic to those of the more proactive European countries (Andresen 1993).

Political parties in the U.S. also are associated with certain policy preferences. Republican administrations, such as those of Reagan and Bush, are probably more likely to favor market mechanisms than are Democratic administrations, such as the Carter Administration, which was known for its more regulatory approach to environmental policy. Democrat-led governments often resemble egalitarian cultures in their desire to rein in unrestrained capitalism and promote a more equitable distribution of national wealth. Similarly, Japan also exhibited traits normally associated with a different cultural type--a market culture--in its use of market mechanisms to reduce emissions. Owing to such contradictions, then, one sees that cultural theory alone cannot account for countries' choices of policy instruments.

Other variables besides cultural dynamics are likely influence national behavior. For example, while Japan's response to the climate change issue was consistent with cultural theory's projections for speed of implementation, it is important to note that not all hierarchies move quickly. Top-down decision-making styles do not always engender swift action. Some hierarchies, including the former Soviet Union, are large, inefficient, and impoverished; implementation of government-directed policies is usually slow. This suggests that cultural theory by itself is not adequate in explaining national behaviors.

Another weakness of the application of cultural theory is that the theory often lends itself to different interpretations. For example, Sweden imposed a carbon tax which contained breaks for some industries. But cultural theory tells us that an egalitarian society places high value on uniform application of rules and regulations. One could therefore argue that Sweden's unequal taxation policy favors certain (powerful) groups, pointing to strong hierarchical elements within the society. On the other hand, one could also argue that such tax breaks represent the natural tendency of an egalitarian-dominant culture to level the playing field. There are many instances where events can be explained in such a way that they suit--or do not suit--the tenets of cultural theory, depending on the analyst's point of view.

In addition, it is often difficult to quantify such abstractions as "strife" and "consensus." That is, since virtually no decision can be made without some dissent from some source, and since consent is often grudging, it can be difficult to determine at what point a country ceases to exhibit the characteristics of a consensus-seeking egalitarian culture and takes on the characteristics of the more aggressive market culture. The subjective nature of this determination can greatly complicate the task of assigning cultural categories.

There are several reasons why cultural theory may not satisfactorily explain what happened in each of the three countries discussed in this paper. One reason is that the theory was originally developed for application at the individual or group--as opposed to national--level; the national dimension adds an additional layer of complexity. Like all models, moreover, cultural theory represents an oversimplification of highly complex systems. No country will fit into an exact mold of a given cultural type: all nations exhibit elements of the other cultures. The theory only suggests that there is a tendency of a given nation to belong to one of the three major cultural types. While cultural theory enables us to explain differences in how countries make and implement policies, it cannot, as a model, explain all the multiple interactions which may lead to outcomes different than those projected. When a model cannot be captured mathematically, i.e., if it involves qualitative rather than quantitative data, such limitations appear significant.

V. Conclusion

As this paper has shown, before the Framework Convention on Climate Change was signed in Rio de Janeiro in 1992, Sweden, the United States, and Japan were already well on the way toward establishing an appropriate response to the GHG problem, though ways of addressing the issue varied markedly between countries. Each country sought solutions appropriate to its particular national culture.

This paper used a series of five tests on three countries to verify the claims of cultural theory with respect to the global warming problem. Table 1 summarizes the projections of the theory; Table 2 shows whether the actual outcomes corresponded to the expectations. While the theory cannot adequately explain all aspects of a country's behavior, there were enough consistencies to enable us to conclude that a majority of its projections held. The theory was strongest in projecting the nature of the policy processes and weakest in projecting choices of policy instruments, since each country employed a combination of various types of instruments, most notably fiscal incentives and research and development.

Table 1 Projections of Cultural Theory

Test	Egalitarian (test: Sweden)	Market (test: United States)	Hierarchy (test: Japan)
Global commons	aggressive action required to preserve commons for future generations; access to global resources based on equal distribution	reluctance to act because of potential costs and short-term focus; global resources distributed on first come, first served basis	rational allocation of resources based on technocratic assessment of needs
Policy-making and implementation process	marked by dissent but resulting in compromise; participation by many public and private sector actors	conflict-ridden; significant disagreement among interested parties hinders attempts to act; participation by many public and private sector actors	smooth, owing to bureaucratic dominance of the issue; debate mostly at the government level
Policy instruments	information and regulation uniformly applied	fiscal incentives and R&D	regulation and fiscal incentives
Speed of policy-making and implementation process	quick, owing to national consensus	slow, owing to wide-ranging dissent	quick, owing to top-down management approach
Role of technology in addressing environmental threats	technology less important than changes in behavior; innovation decentralized	technology considered important; market forces determine innovation patterns	technology considered important; innovation patterns determined by bureaucracy

Table 2 National Cultural Theory Scoreboard:

Did nations respond according to projections of cultural theory on each of the five questions?

Test	Sweden	United States	Japan
Global commons	yes	yes	yes
Policy process	yes	yes	yes
Instrument choice	no	partially	no
Speed of policy-making and implementation process	yes	yes	yes
Role of technology	no	yes	yes

Most important is the fact that cultural theory enabled us to see that, in dealing with matters of international concern, every country approaches the negotiating table with different goals and ideas of what are realistic and desirable outcomes. Such differences in outlook can be ascribed in large part to differences in political cultures, which influence how a country will frame an issue, who will play the most significant role in shaping the debate, what the policy making process will be like, and which instruments will be chosen to achieve the desired result. In the case of climate change, we have seen how Sweden regarded the issue as potentially serious and early on made a commitment to reduce its production of greenhouse gases. Relevant policy measures quickly supported the decision. The United States, by contrast, was less willing to accept the reality of a global warming threat and postponed making important policy decisions that could have an impact on the economy. The tendency of individuals in the U.S. to attempt to influence national decision-making in their own favor meant that the U.S. government was unable to take decisive action on the global warming question; hence, its response was viewed by other countries as weak. Japan responded in a similarly conservative fashion, though ultimately it was motivated to act primarily as a result international pressure, rather than out of concern about the global warming problem itself. Its plan to stabilize per capita CO₂ emissions at 1990 levels by 2000 has similarly been criticized for lack of rigor. Nonetheless, Japan did respond with a major centralized technology-based program to enhance energy efficiency.

While it does not fully describe any one country, cultural theory nonetheless can help account for some of the differences in national attitudes toward problems of international concern. Thus, the theory could be used in the future to project how a given country may respond to a

pressing global issue. It may further assist those individuals charged with formulating international agreements in designing regimes which are of optimum effectiveness. The theory implies that international negotiators have two choices when developing an international regime: they can design agreements which allow countries maximum discretion in implementing policies domestically, or they can make policy recommendations on a country-by-country basis.

Since cultural theory acknowledges that each nation has different cultural constraints in addressing national problems, negotiators may wish to design agreements which contain few specific requirements, thereby allowing countries to make the policy decisions most compatible with their own cultural types. For example, such an agreement may set targets and timetables that countries would need to meet, but it would not contain any specific prescriptions for how countries should accomplish those goals. In other words, the agreement would contain no provisions on mandatory policy measures, such as taxes or regulations, which countries must apply to meet the treaty's objectives. The existing Convention of Climate Change is an example of this type of agreement, except that it is a framework agreement only and as such does not contain specific targets and timetables; discretion for appropriate policy measures lies with the individual member nations.

The second option would mean that negotiators would need to assign obligations to countries based on an agreed-upon understanding of how each society operates. Each country would propose to an international committee what it believes its dominant culture to be, or each country could propose its own package of policy measures to meet some broad international obligation. After this has been established, the committee would evaluate the various packages to ensure that they are generally consistent with broader international goals. However, details of implementation would be left to the individual countries. For example, some countries may be inclined to employ a combination of regulation and information, while others may be more suited to a regime consisting primarily of fiscal incentives. But the package would not be limited to domestic actions alone: countries would be allowed to act abroad as well, as long as activities undertaken are consistent with international objectives, the culture of the implementing nation, and the development goals of the host country. The U.S., for instance, because of its preference for market mechanisms, may favor joint implementation schemes. Sweden, in addition to its domestic actions, may elect to assist developing countries with population control, a goal entirely consistent with the egalitarian viewpoint. An approach such as this not only takes into account different cultures, but it also recognizes that global warming is a commons problem, and greenhouse gas reductions can occur anywhere.

It is conceivable that an arrangement such as the one described above, while requiring more time to design, would have a greater chance of success, since countries would be forced to

give thought to selecting policy measures *during* treaty formulation, instead of afterwards. Indeed, some treaties are ineffective because, even though negotiators commit to things internationally, they are unable to implement them once back home, owing to domestic opposition. An agreement such as this would take domestic factors into considerations early enough to minimize potential internal obstacles.

Whichever option negotiators may choose, cultural theory offers a potentially useful new means of arriving at agreements aimed at managing the global commons and should be taken seriously in the development of international regimes.

Because it recognizes the importance of cultural influences in national decision-making, moreover, cultural theory goes beyond the traditional comparative political economy approach to explaining national policy choices. Political economy studies ascribe differences in national approaches to common problems to differing political systems. In so doing, these studies overlook one of the most important reasons why countries behave the way they do: variations in national cultures. This paper reminds us that the influence of culture and social values cannot be neglected, and while cultural theory by itself cannot fully describe any country, it can be used as *one* tool in a varied arsenal for explaining differing domestic responses and designing useful agreements.

References

- Anderson, A. *Science and Technology in Japan: Second Edition*. Longman Group, Ltd. (London: 1991).
- Andrain, C. 1994. *Comparative Political Systems: Policy Performance and Social Change*. Armonk, NY: M.E. Sharpe.
- Andresen, S. 1993. "U.S. Climate Policy: Ideology vs. Pragmatism." Lysaker, Norway: The Fridtjof Nansen Institute.
- Bohm, P. 1994. "Environment and Taxation: the Case of Sweden." *Environment and Taxation: the Cases of the Netherlands, Sweden, and the United States*. Paris: OECD.
- Brickman, R.; Jasanoff, S; and Ilgen, T. 1985. *Controlling Chemicals: the Politics of Regulation in Europe and the United States*. Ithaca, NY: Cornell University Press.
- Clinton, W. and A. Gore. 1993. *Climate Change Action Plan*. Washington, D.C.
- Committee on Earth and Environmental Sciences. 1989. "Our Changing Planet: the FY 1990 Research Plan."
- Committee on Earth and Environmental Sciences. 1992. "Our Changing Planet: the FY 1992 Research Plan."
- de Tocqueville, A. 1835. *Democracy in America*. eds. J.P. Mayer and Max Lerner. New York: Harper and Row Publishers.
- Dickson, N. Forthcoming. "The Emergence of the Climate Change Issue in the United States," in Elizabeth Economy and Miranda Schreurs (eds) *Linkage Politics: The Domestic and International Dimensions of Global Environmental Protection*. (forthcoming).
- Douglas, M. and Wildavsky, A. 1982. *Risk and Culture*. Berkeley: University of California Press.
- Eikeland, P. 1993. "U.S. Energy Policy at a Crossroads?" Lysaker, Norway: The Fridtjof Nansen Institute.
- Fermann, G. 1994. "Political Leadership and the Development of Problem-Solving Capacity in the Global Greenhouse." Lysaker, Norway: The Fridtjof Nansen Institute.
- Fermann, G. 1992. "Japan in the Greenhouse: Responsibilities, Policies, and Prospects for Combating Global Warming." Lysaker, Norway: The Fridtjof Nansen Institute.
- George C. Marshall Institute. 1990. "Global Warming: What Does the Science Tell Us?" Executive Summary. Washington, D.C.
- Government of Sweden. 1991. "Inter-Party Agreement on Energy Policy in Sweden." Stockholm.
- Government of Sweden. 1991. "Tomorrow's Energy." Stockholm.

- Hampden-Turner, C. and Trompenaars, F. 1993. *The Seven Cultures of Capitalism*. London: Piatkus Publishers, Ltd.
- Hecht, A. and Tirpak, D. 1994. "Framework Agreement on Climate Change: A Scientific and Policy History." (forthcoming).
- Intergovernmental Panel on Climate Change. 1992. *Climate Change 1992: The Supplementary Report to the IPCC Scientific Assessment*. Cambridge, UK: Cambridge University Press.
- Intergovernmental Panel on Climate Change. 1990. *Climate Change: The IPCC Scientific Assessment*. Cambridge, UK: Cambridge University Press.
- Kelman, S. 1981. *Regulating America, Regulating Sweden*. Cambridge, MA: MIT Press.
- Loefstedt, R. 1993. *Dilemma of Swedish Energy Policy*. Aldershot, UK: Ashgate Publishing.
- Marland, G., R. Andres, and T. Boden. Global, Regional, and National CO₂ Emissions. pp. 505-584. T. Boden, D. Kaiser, R. Sepanski, and F. Stoss (eds.) *Trends '93: A Compendium of Data on Global Change*. ORNL/CDIAC, Oak Ridge National Laboratory, Oak Ridge, TN.
- Morisette, P. 1992. "Approaching Global Warming: A Review of the Adaptation and Mitigation Perspectives." Proceedings of a Conference on Global Climate Change: Social and Economic Research Issues. Eds. Midwest Consortium for International Energy Studies and Argonne National Laboratory.
- Newton, D. 1993. *Global Warming: A Reference Handbook*. Santa Barbara, CA: ABC-CLIO.
- Nordhaus, W. 1991. "To Slow or Not to Slow: the Economics of the Greenhouse Effect." *The Economic Journal*, no. 407. pp. 920-937.
- Organization for Economic Cooperation and Development. 1994A. *Climate Change Policy Initiatives, 1994 Update*. Vol. 1. Paris: OECD.
- Organization for Economic Cooperation and Development. 1994B. *OECD Environmental Performance Reviews: Japan*. Paris: OECD.
- Organization for Economic Cooperation and Development. 1993. *Energy Policies of OECD Countries*. Paris: OECD.
- Organization for Economic Cooperation and Development. 1992. *Climate Change: Designing a Practical Tax System*. Paris: OECD.
- Peterson, M. and L. Wade. 1985. "Environmental Pollution Policy in Japan: A Public Choice Hypothesis." in *Public Policy Across Nations: Social Welfare in Industrial Settings*. Ed. A. Groth and L. Wade. Greenwich, Connecticut: JAI Press, Inc.
- Rayner, S. 1991. "A Cultural Perspective on the Structure and Implementation of Global Environmental Agreements." *Evaluation Review*. Vol. 15, No. 1.
- Rayner, S. 1984. "Disagreeing About Risk: The Institutional Cultures of Risk Management and Planning for Future Generations." *Risk Analysis, Institutions, and Public Policy*, ed. S. G. Hadden.

- Reinstein, R. Winter 1993. "Climate Negotiations." *The Washington Quarterly*.
- Research Institute of Innovative Technology for the Earth. 1990. Informational Brochure. Tokyo.
- Schreurs, M. 1994. "Japan and the Globalization of the Environment: Acid Rain, Stratospheric Ozone Depletion, and Global Climate Change." Paper prepared for the project on Social Learning in the Management of Global Environmental Risks, Victoria, Canada.
- Schwarz, M. and M. Thompson. 1990. *Divided We Stand*. Philadelphia: University of Pennsylvania Press.
- Swedish Ministry of the Environment and Natural Resources. 1994A. "Sweden's National Report under the UN Framework on Climate Change." Stockholm.
- Swedish Ministry of the Environment and Natural Resources. 1994B. "The Swedish Experience: Taxes and Charges in Environmental Policy." Stockholm.
- Swedish Ministry of the Environment. 1991. *Economic Instruments in Sweden*. Stockholm.
- Tanabe, A. and M. Grubb. 1991. "The Greenhouse Effect in Japan: Burden or Opportunity?" in *Energy Policies and the Greenhouse Effect*. ed. M. Grubb. Brookfield, Vermont: Dartmouth Publishing Company.
- United States Department of Commerce. 1992. *Statistical Abstract of the United States 1992*. Washington, D.C.: U.S. Government Printing Office.
- United States Department of Energy. 1989. *A Compendium of Options for Government Policy to Encourage Private Sector Responses to Potential Climate Changes*. Washington, D.C.: U.S. Government Printing Office.
- Vogel, D. 1986. *National Styles of Regulation*. Ithaca, NY: Cornell University Press.
- Wald, M. April 5, 1990. "Industry Wary on Clean-Air Bill." *The New York Times*.
- Watanabe, Chihiro. 1994. "Sustainable Development by Substituting Technology for Energy and Environmental Constraints: Japan's View." Paper presented at the Maastricht Workshop on the Transfer of Environmentally Sound Technology.
- Weidner, H. 1993. "Globale Umweltherausforderungen," in *Japan und Europa: Getrennte Welten?* Ed. Hanns Maull. Frankfurt: Campus Verlag.

Other:

Telefax communication with Tom Hedlund, Director, Swedish Commission on Climate Change, Stockholm.

Interview with Dr. Chihiro Watanabe, Deputy Director for Technology Development, Agency for Industrial Science and Technology, MITI.