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GLOBAL CLIMATE CHANGE POLICY ISSUES RELATED TO THE MOVEMENT OF INDUSTRY FROM DEVELOPED TO RAPIDLY INDUSTRIALIZING COUNTRIES

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1.0 INTRODUCTION

Increased human activities in developed and developing countries are impacting the composition of the earth's atmosphere. Evidence suggests that changes in the atmosphere can be attributed to an increasing use of fossil fuels, the destruction of the tropical rainforests, and emissions of industrial chemicals (California Energy Commission, 1989). These activities result in increasing emissions of radiatively important gases, i.e., carbon dioxide, chlorinated fluorocarbons (CFCs), methane, surface level ozone, nitrous oxide. In an attempt to mitigate the effects of these greenhouse gases, international, national and local global climate change policies have been proposed and in some cases adopted.

These global climate change policies have raised other concerns:

- Will U.S. industries suffer economic losses as a result of climate change policies and regulations?
- Will these economic losses lead to flight of industries from developed to developing nations?
- Can international policies eliminate the temptation of industry to locate production facilities abroad?

PURPOSE AND SCOPE

Global climate change policies adopted by developed countries may encourage industries to move to countries with less restrictive policies. The purpose of this study is to identify policy-driven issues that may result in such a movement. This report 1) summarizes the conclusions of previous studies that have explored the relationship between environmental regulations and industrial movement, 2) identifies and summarizes existing and proposed U.S. global climate change policy options, and 3) discusses issues and topics relating to possible industrial relocation because of the global climate change policy options. It concludes with recommendations for further research. Although federal global climate change policy options are the primary focus of this report, some international and regional efforts addressing this issue are also included. A potential regional industrial migration issue is highlighted.

Movement of industry from developed to developing countries to escape environmental regulations may have an adverse effect on the population of the developing country. Unilateral efforts to mitigate the effects of radiatively important gases may be counterproductive and could actually result in an increase in emissions. Limited resources in developing countries are devoted to adopting or enforcing environmental and occupational standards. Escalating emission rates from industries in developing countries would further compromise the health status of the local population.

BACKGROUND

Concern is growing regarding the climatic impacts of the emissions of radiatively important gases. In response, the United States and other industrial countries are beginning to consider a wide range of policy and regulatory options to reduce the emission of these gases. Some of these options include measures to increase overall energy efficiency, increase the use of non-fossil fuels, increase reforestation, reduce or completely ban the use of specific substances, and use specific technologies to reduce directly the emission of radiatively important gases.

The cost of complying with some of these environmental policies could impact the economic viability and international competitiveness of specific industries in this country. This, in turn, could force some industries to relocate or expand their operations to countries with less stringent environmental policy regulations and enforcement.

TECHNICAL APPROACH

No study has been conducted to specifically analyze the relationship between global climate change policies and the potential movement of industry. Research has been conducted, however, to assess the role of environmental regulations on potential industrial migration. A literature review was conducted to identify previous studies that explored the relationship between environmental regulations and industrial movement. To identify the specific policy options, proposed federal legislation addressing global climate change was then identified, reviewed and summarized. Industries potentially impacted if adoption of the policies occurred were identified according to each

specific proposal. Because of its leadership in air quality management issues, policy development on global warming and ozone depletion for the South Coast Air Quality Management District (SCAQMD) in Southern California was obtained and reviewed as a specific case study. Conversations with policymakers and industrial representatives supplemented the literature review.

2.0 PREVIOUS STUDIES

One study to explore the relationship between environmental regulations and potential relocation of industry on an international basis was conducted by Leonard (1984). Leonard's study examined the impact of environmental regulations on U.S. industry and the potential shift of production to countries with less stringent environmental regulation. It analyzed international trade and investment trends for U.S. industries to determine whether environmental policies and regulations are causing flight of highly polluting U.S. industries abroad.

To test the extent of potential movement of industry from developed to developing countries, Leonard used two approaches

- identify industries that spend capital in pollution abatement control equipment
- examine foreign investments and import data of pollution intensive industries.

An analysis of these factors will not necessarily conclusively define the role of environmental regulations on industrial migration. The analysis will indicate, however, whether trends are moving in a direction that would be expected if environmental regulations were a critical location decision. Leonard's findings suggest that environmental regulations have not resulted in substantial relocation of industry to developing countries. The analysis of foreign investments by U.S. companies and U.S. imports of manufactured goods produced no evidence to suggest that industries have shifted production abroad. However, in some hazardous-production industries (e.g., asbestos, benzidine dyes, and some pesticides) environmental and occupational standards have become a factor for location decisions. In a second study Leonard (1988)

concluded that Mexico appears to be a "pollution haven" for some companies that produce hazardous chemical substances. The establishment of maquiladora industries was suggested to support the "pollution haven" premise.

Maquiladora industries are composed of mostly foreign-owned industries that receive components and raw materials into Mexico duty-free, where a cheap labor force assembles the product (San Diego, 1988). Through special custom treatment and foreign investment regulations, this program permits companies to assemble their product in Mexico, then export the finished product to the United States. Duty is paid to the U.S. government only on the value added by the assembly that is completed in Mexico (American Chamber of Commerce of Mexico, 1987).

Clement and Jenner (1987) surveyed executive officers in the U.S. who had operational facilities in Mexico. One of the objectives of the survey was to assess the importance of criteria in their decision to locate in Mexico, e.g., lower transportation costs, better availability of labor, lower transportation cost, lower energy cost, environmental regulations.

Respondents to the questionnaire ranked factors that influence location decisions for offshore production facilities. The majority of the respondents concluded that Mexico is more attractive than other countries, i.e., Taiwan, to locate industry. Environmental regulations ranked seventh out of eleven possible location factors that influence location selections. This study concluded that environmental regulations are "slightly important positive factors in favor of Mexico" (Clement and Jenner, 1987). Ratings of location factors for Baja California, compared with other areas of Mexico, did not suggest environmental regulations were an influencing location factor.

A more recent study[a] assessed whether an air quality rule adopted by the SCAQMD has lead to a decline of the wood products industry in Southern California. In 1988, SCAQMD revised Rule 1136. This rule limits the amount of volatile organic compounds (VOC) emissions from the wood products industry.

(a) Draft report of thesis by A. M. Lesperance, University of California at Los Angeles, "Air Quality Regulations and Their Impact on Industrial Growth in California, Based on Census Data: Case Study of the South Coast Air Quality Management District Rule 1136 and the Wood Products Coating Industry."

The objective of the study was to assess whether an evaluation of the census data (i.e., number of establishments and employment) could establish if adoption of the rule by SCAQMD

- resulted in a reduction in employment and facilities of the wood products industry
- encouraged the relocation of industry to Mexico's maquiladora industry.

Evidence from this study suggested that data analysis of the total number of establishments is not a reliable factor in assessing the impact of the air quality rule. The analysis of employment data provides a more accurate assessment of the impact of this rule on the wood furniture industry. The results of this study indicated that for some of the wood products industries employment declines could be attributed to knowledge of the adoption of Rule 1136. However, it could not be determined from the data whether the decline in employment was a direct result of adoption of the regulation or some other factor, i.e., availability of cheap labor, rising workmen's compensation costs.

In conclusion, previous studies have not isolated environmental regulations as the conclusive factor in industries' decisions to locate abroad rather than in the United States. Data to imply a cause and effect relationship do not exist at this time. Although some studies have attempted to demonstrate the relationship between environmental regulations and location (relocation) of industry to other countries, no study has been conducted that analyzes global climate change policies on this potential movement.

To conduct such an analysis, 1) an overview of global climate change policy options must be conducted; 2) specific industries potentially impacted by the policies must be identified; 3) a methodology to assess the potential impact of the options must be developed; and 4) data must be collected and analyzed. The following section provides preliminary information on the first two phases of such an analysis.

3.0 REVIEW OF GLOBAL CLIMATE CHANGE POLICIES

Global climate change policies have taken many forms; e.g., international agreements, regional ordinances, and rules. This section identifies and summarizes some international, national and regional global climate change policy options. It also identifies four categories of industries that likely will be impacted by proposals to combat global climate change.

INTERNATIONAL - MONTREAL PROTOCOL

The first major international convention on loss of stratospheric ozone due to CFC emissions convened in Montreal, Canada, in September 1987. The purpose of the conference was to obtain signatures to a protocol to the Vienna Convention (McDonald, 1989). The original protocol called for a 50% reduction in CFC production by 1998. However, additional scientific data forced a revision to the original protocol.

In May 1990, signataries at the convention agreed to phase out production of CFC (from the baseline year of 1986) by 20% by 1993, 50% by 1995, 85% by 1997, and 100% by the year 2000. In addition, methyl chloroform and carbon tetrachloride were added to the list of ozone-depleting substances. These two substances will be banned by 2005 and 2000, respectively (Clean Air Report, 1990). The U.S. Environmental Protection Agency (EPA), in response to the Montreal Protocol, has adopted regulations limiting the production, import, and export of CFCs and halons. Pursuant to the Clean Air Act, the regulations became final on April 3, 1989 (54 FR 13502). As of June 1990, 56 countries, and the European Community had ratified the Montreal Protocol (see Figure 1). Although some controls have been adopted limiting the amount of CFC and halon emissions into the environment, other radiatively important gases, i.e., CO_2, methane, nitrous oxide and other greenhouse gases, are largely unregulated and are likely to increase.

NATIONAL - PROPOSED LEGISLATION

Announcements from the scientific community that the ozone hole over the Antarctic had grown faster than anticipated, and concerns over the increasing greenhouse gas emissions led Congress to produce a flurry of proposed

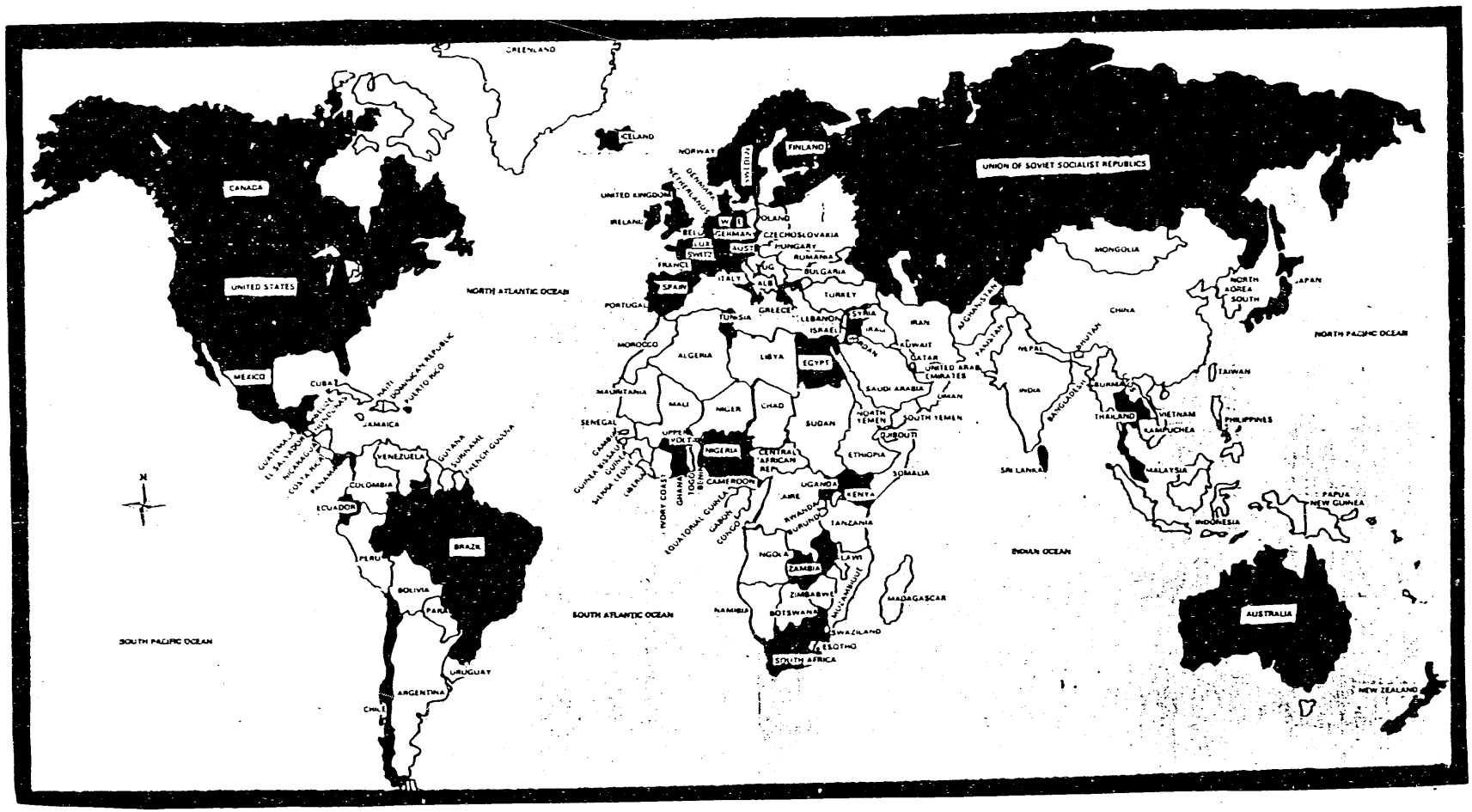


Figure 1 Countries Party to the Montreal Protocol

(June 1990)

legislation to address the environment. Attempts to reduce or control the emissions of radiatively important gases have taken many forms. Proposed options ranged from establishment of a council on World Environmental Policy to recycling of ozone-depleting substances to the conservation of world biodiversity. Appendix A provides a summary of the proposed global climate change legislation in the United States. Major policy areas addressed in the legislation are categorized according to broad subject areas. An overview of the major items proposed in twenty bills is summarized in Table 1A and 1B. Much of the proposed national legislation to prevent global climate change is intended to

- eliminate the production of CFCs
- restrict or regulate the production of other greenhouse gases (CO_2, CH_4, NO_2)
- promote energy efficiency and conservation
- establish international cooperation in environmental policy making
- protect tropical forests.

REGIONAL - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT GLOBAL CLIMATE CHANGE POLICY

The SCAQMD is the air pollution control district that includes Los Angeles, Orange, Riverside, and San Bernardino counties in Southern California. On April 6, 1990, the SCAQMD adopted a policy on global warming and stratospheric ozone depletion. The SCAQMD policy calls for the phase-out of CFCs and halons on or before 1997 and of hydrochlorofluorocarbons (HCFCs) and methyl chloroform at the earliest possible date. In addition, the SCAQMD will develop strategies in 1991 to reduce CO_2 and methane emissions. The SCAQMD has taken a national leadership role in adopting air quality regulations. Because of SCAQMD's proximity to Mexico, a rapidly industrializing country, concern exists that industry is moving from Southern California to Mexico.

Table 1A Summary of Proposed U.S. Global Climate Change Policy Options

	GLOBAL CLIMATE CHANGE RESEARCH	INTERDISCIPLINARY FEDERAL RESEARCH PLANNING	CFC LABELING REGULATION	CFC PHASE-OUT/ SUBSTITUTE	RESTRICT UTILITY EMISSIONS	RESTRICT SOURCE EMISSIONS	MOBILE REQ	CO_2 REQ	CH_4 REQ	NO_2 REQ	ENERGY CONSERV/ EFFICIENCY PROGRAM	ALTERNATIVE RENEWABLE ENERGY PROGRAM	NUCLEAR POWER	CLEAN COAL	NATURAL GAS
HCR 44 BATES															
HJ RES 287 FAZIO								X							
HR 603 STARK			X												
HR 711 SHARP											X	X			
HR 842 COBLE															
HR 860 JONES	X	X													
HR 1078 SCHNEIDER			X	X	X	X		X	X	X	X	X			X
HR 2984 ROE	X	X													
SJ RES 88 BIRTH								X	X	X	X				
S 189 HOLLINGS	X	X													
S 281 GORE		X		X	X						X				
S 251 MOYNIHAN	X	X													
S 324 BIRTH	X							X		X	X	X	X	X	X
S 333 LEAHY		X	X	X	X	X		X	X	X	X		X		
S 491 CHAFEE			X	X											
S883 BOSCHWITZ		X		X				X	X	X	X	X			
S 878 BAUCUS			X	X		X		X	X		X				
S 879 GORE			X												
S 871 GORE				X											
S 872 GORE				X											

Source: Adopted from California Energy Commission, August 1990

Table 1B Continuation of Proposed U.S. Global Climate Change Policy Options and Status of the Legislation as of June 1990

	INTRODUCE 'LEAST-COST' ENERGY PLANNING	RECYCLING POLICY	EMPHASIZE STATE IMPLEMENTATION	URBAN TREE PLANTING/ REFORESTATION	CREATE ENVIRON. COUNCIL IN EXEC. OFFICE	INTERNATIONAL COOP. IN ENVIRON. POLICY MAKING	PROTECT TROPICAL FORESTS	INTERNATIONAL LENDING INST. IMPLICATIONS	INTERNATIONAL POPULATION CONTROLS	CONSERVATION OF BIO-DIVERSITY	STATUS OF LEGISLATION
HCR 44 BATES							X				In committee no action
HJ RES 287 FAZIO						X	X				In committees no action
HR 683 STARK											no action
HR 711 SHARP				X							back in full committee
HR 842 COBLE							X				In committee no action
HR 988 JONES					X	X					in committee
HR 1078 SCHNEIDER	X	X	X	X		X	X	X	X		in committee marked up
HR 2984 ROE					X	X					in committee placed on calendar
SJ RES 88 BIRCH						X	X				Act as of February 1990
S 189 HOLLINGS											template legislation
S 281 GORE		X			X	X	X	X	X	X	no action report due
S 251 MOYNIHAN											from committee CFC provisions
S 324 BIRCH	X		X	X		X	X	X	X		In other legis. passed as part of CAA
S 353 LEAHY						X					provisions in other legis. hearing May 89
S 491 CHAFEE											no action
S883 BOSCHWITZ				X	X	X	X	X		X	In commerce committee
S 878 BAUCUS						X		X			In finance committee
S 879 GORE											in committee
S 871 GORE											
S 872 GORE											

Source: Adopted from California Energy Commission, August 1990

INDUSTRIES POTENTIALLY IMPACTED BY GLOBAL CLIMATE CHANGE POLICIES

Many regulations to limit the amount of radiatively important gases have been proposed. Some of these include modification of automobile emissions standards, banning of CFCs from production and use in the United States, tighter regulations on metal and chemical processing and manufacturing, elimination of certain pesticide and chemicals, mandatory recycling, creation of new economically and environmentally sound technologies, increased efficiency of manufacturing methods, and use of products. Adoption of some of these requirements will have an impact on specific industries.

Global climate change legislation was reviewed and summarized. Also, after review of the proposed legislation, industries potentially regulated or impacted by the policy were identified. Major industrial categories were then linked to specific policy options contained in the proposed global climate change legislation (California Energy Commission). Table 2 lists four broad source categories that were identified according to their industrial process and emission of major pollutants. (Potentially impacted industries were identified using the SCAQMD Air Quality Management Plan 1988, Appendix III-A Emissions Inventory Report.) It also classifies some of the industries associated with the source category. Table 3 provides a summary of the major industries potentially impacted by each of the global climate change proposals.

Industry sources most frequently identified as impacted by the proposed legislation are found in source categories 1 and 2. Specific industry types and activities associated with these sources include vehicles, incinerators, petroleum and coal combustion, wood furniture manufacturers, agriculture, industrial manufacturing, electric utilities, and chemical manufacturing.

Table 2 Radiatively Important Industries Classified by Source of Emissions

Category	Sources	Industries
1	CO_2/fossil fuels	vehicles incinerators petroleum/coal combustion
2	NOx/fossil fuel, wood burning, solvents, fertilizer	wood furniture manufacturing agriculture industrial manufacturing electric utilities vehicles chemical manufacturing
3	CH_4/fossil fuel, biogenic activity, petroleum/gas, production	waste disposal livestock waste gas distribution agricultural burning
4	CFC/refrigerants, plastic foam, aerosols, solvents coatings	printing/graphics electroplating metal cleaning degreasing dry cleaning air conditioning fire retardants

Table 3 Proposed Global Climate Change Policies, Major Elements of the Policy, and Sources of the Emissions*

	CFC LABELING REGULATION	CFC PHASE-OUT/ SUBSTITUTE	RESTRICT UTILITY EMISSIONS	RESTRICT MOBILE SOURCE EMISSIONS	CO2 REG	CH4 REG	NO2 REG	ENERGY CONSERV/ EFFICIENCY PROGRAM	ALTERNATIVE/ RENEWABLE ENERGY PROGRAM	NUCLEAR POWER	CLEAN COAL	NATURAL GAS
HCR 44 BATES												
HJ RES 267 FAZIO					1							
HR 583 STARK	4											
HR 711 SHARP								1, 2	1, 2, 3			
HR 842 COBLE												
HR 988 JONES												
HR 1878 SCHNEIDER	4	4	1, 2	1, 2, 3	1		2	1, 2	1, 2, 3			1
HR 2984 ROE												
SJ RES 88 WIRTH					1	3	2	1, 2				
S 169 HOLLINGS												
S 281 GORE		4	1, 2					1, 2				
S 251 MOYNIHAN												
S 324 WIRTH					1		2	1, 2	1, 2, 3	1, 2 (a)	1	1, 2
S 333 LEAHY	4	4	1, 2	1, 2, 3	1	3	2			1, 2 (a)		
S 491 CHAFEE	4	4										
S683 BOSCHWITZ		4			1	3	2		1, 2, 3			
S 576 BAUCUS	4	4		1, 2, 3	1	3						
S 870 GORE	4											
S 871 GORE		4										
S 872 GORE		4										

* See Table 3 for a list of the emission sources.

(a) impact inferred from legislation

4.0 ISSUES RELATING TO RELOCATION OF INDUSTRY FROM THE SCAQMD

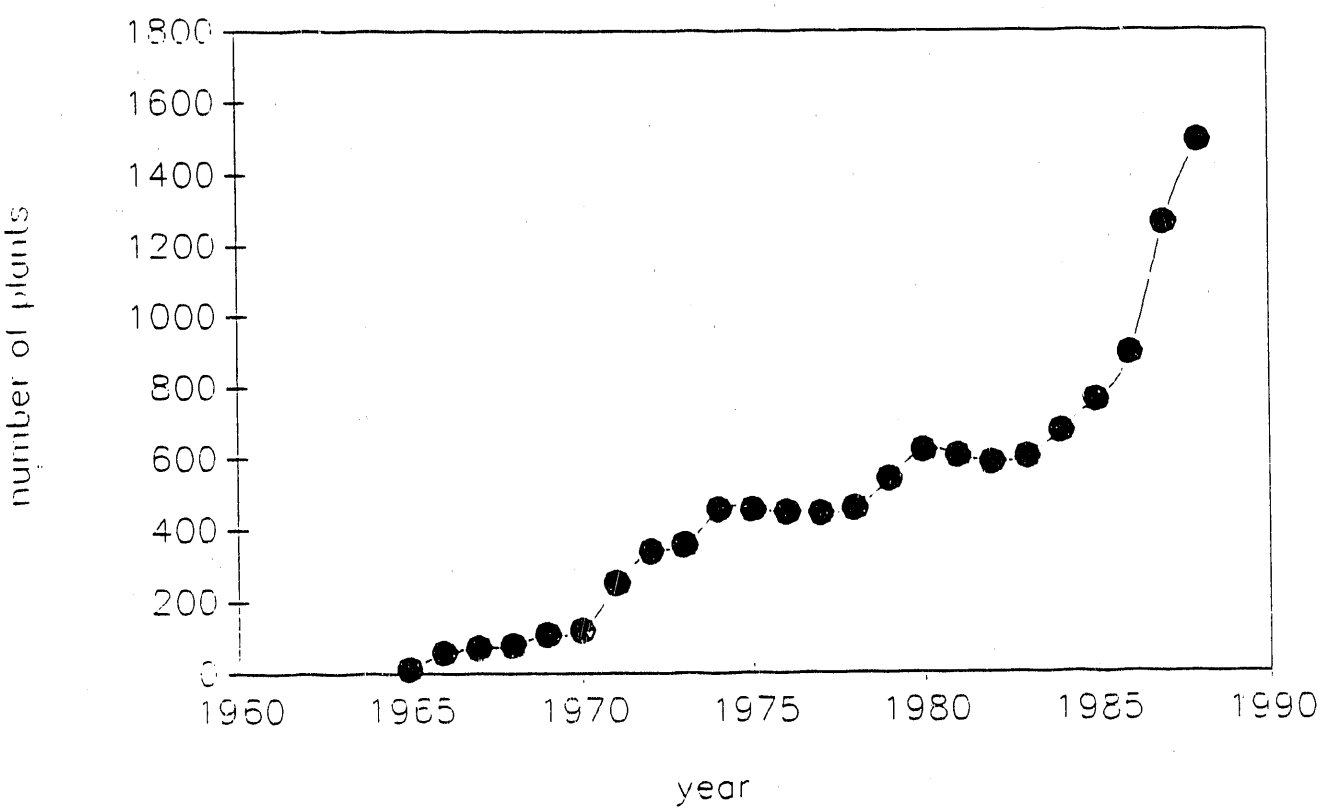
The number of maquiladora industries has increased rapidly during the past four years. Approximately 1500 facilities are currently operating in Mexico. The growth of the maquiladora industries in Mexico between 1965 and 1988 is shown in Figure 2. Many factors affect an industry's decision to locate to Mexico. A more thorough examination is needed of the impact or potential impact of global climate change policies on this rapid industrial growth in Mexico.

Some of the industries potentially impacted by U.S. global climate change policies are also industries that have established maquiladoras in Mexico. The maquiladora industries include electrical and electronic assembly, chemical production, textiles, foundries, wooden and metallic furniture, footwear, sporting goods, and other manufacturing industries. Although these industries have grown substantially in Mexico, the role that national global climate change policies and other air quality regulations may have on the potential growth of industry in Mexico is presently unknown. However, some industries identified in Table 2 have been suggested as industries likely to feel a negative impact of global climate change policies in the SCAQMD. Specifically, comments on the proposed SCAQMD policy statement stated that the policy would encourage electricity suppliers to locate to areas where the controls were less stringent (SCAQMD 1990). Wood furniture, assembly of small electronic parts, semiconductor, and coating industries have been identified as industries likely to leave the SCAQMD for other locations.(a)

Because of the lack of appropriate data, the impact of these policies is currently unknown. In addition to environmental regulation, other factors may have significant impact on an industry's decision to leave the SCAQMD. Workmen's compensation costs have risen significantly for some industries in California. In addition, the availability of a cheap labor force in Mexico may be another reason for possible relocation. For example, the annual labor

(a) Personal communication with J. Bunnell, Southern California Edison, June 7, 1990.

Figure 2 Maquiladora Plants in Mexico 1965-1988



Source: U.S. Dept. of Labor/Maquiladora Newsletter

cost savings for a wood furniture facility relocating to Mexico ranges from $10,000 - $15,000 per worker (Bennett, 1989).

5.0 CONCLUSION AND RECOMMENDATIONS

To assess whether the proposed policies have an impact on relocation of industry, future research must be conducted to establish a negative impact on the industries identified. A determination must then be made to assess whether the negative impact on the industry is sufficient to force such a relocation. To conduct such an analysis

- an overview of the global climate change policy options must be conducted
- specific industries potentially impacted by the policies must be identified.

This paper provided preliminary information of these two issues. However, a methodology must next be developed and data must be collected to complete the analysis.

FURTHER RESEARCH NEEDED

Increasing restrictions on radiatively important gas emissions in developed countries may lead to a migration of industry from developed countries to countries with less restrictive policies. Because the SCAQMD, a leader in air quality management regulations, is close to Mexico, a country experiencing rapid industrial growth, the potential for migration of industry exists.

An analysis of various factors may assist in assessing the validity of this hypothesis about the potential migration of industry. Data collected from the U.S. Department of Commerce on pollution abatement costs, number of facilities, number of employees, and cost of imported goods may be analyzed. Industrial growth trends in each of these areas could then be determined. This information may be complemented with similar information, to the degree possible, from countries with less restrictive global climate change policies. To illustrate, a possible migration of industry may exist if the following was established:

In the United States, a decline in the number of industries and employees and an increase in pollution abatement and imported goods from developing countries is reported.

In the developing country with less restrictive policies, the number of employees, number of facilities, and exported goods to the U.S. is increasing.

To complement the statistical analysis, a questionnaire may be developed for industry owners and managers in both the United States and the developing country. Similar to the research conducted by Clement and Jenner (1987), the questionnaire would list all factors that impact the industry's location determination. Responses to the questionnaire could provide a basis for assessing the role global climate change policies may have in relocation decisions.

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U.S. Department of Labor

APPENDIX A

GLOBAL CLIMATE CHANGE PROPOSED LEGISLATION
(as of July 1990)

HJ Res 207 "National Global Warming Policy Act" (Fazio)

This resolution states that it is policy of the United States to reduce the generation of greenhouse gases and to encourage other nations to do the same. This policy establishes a date for a multilateral agreement on greenhouse gas reduction, introduces a worldwide program for protection of rainforests, and expresses the need for the development of technologies to provide reliable energy sources while reducing greenhouse gas emissions.

HR 711 "State Energy Conservation Programs Improvement Act of 1989" (Sharp)

This bill amends the Energy Policy and Conservation Act to increase the effectiveness of state energy conservation programs. Each state energy conservation plan would contain the goal of reducing the amount of energy consumed by 10% or more by the year 2000 from projected energy consumption as of October 1, 1990; would establish an energy emergency planning program for an energy supply disruption; and would ensure coordination between local, state, and federal energy and conservation programs within the state.

HR 980 "Global Environment Research and Policy Act of 1989" (Jones)

This bill coordinates oceanographic, atmospheric, terrestrial, and polar research programs within the ten-year National Research Plan to assess and predict the effects of human activities and natural processes on global change. The research plan is to advance the understanding of global change and to establish a base on which policy decisions will be made.

A Council on Global Environment Policy will be created in the Executive Office of the President to advise the Federal Government on domestic and international policies, plans, and programs related to global environmental change.

HR 1078 "Global Warming Prevention Act of 1989" (Schneider)

This bill introduces least cost energy and resource policies to reduce CO2 emissions; an increase in the development and deployment of solar and renewable energy sources; a national forestation initiative including conservation measures and a study of the impact of global climate change on agricultural production; international development assistance with tropical forestry and agriculture and population growth reduction; and a recyclable materials research plan. The proposed legislation outlines a State energy conservation program to be implemented under the Energy Policy and Conservation Act.

HR 2984 "Global Change Research Act of 1989" (Roe)

This proposed legislation is concerned with the pooling of information resources and research capabilities essential for a successful international global change program and the promotion of international and intergovernmental cooperation for assistance efforts in developing nations. This bill establishes a Committee on Earth Science within the Office of Science and Technology to perform research for the federal government in addressing assessment and implementation of national policy on global climate change matters.

HR 3030 "Clean Air Act Amendments of 1989" (Dingell)

Title I- Provisions for Attainment and Maintenance of Ambient Air Quality Standards: stack height and construction regulations for federal facilities; ozone non-attainment dates; vehicle inspections; control technology; gasoline vapor recovery; clean fuel vehicle programs; CO_2 non-attainment vehicle inspections, transportation control through oxygenated fuels; particulate matter and urban fugitive dust emissions from residential wood combustion and prescribed silviculture/agricultural burning; transportation planning and guidance

Title II- Provisions Relating to Mobile Sources: clean fuel regulations, vehicle certification, inspections and fees for non-compliance

Title III- Hazardous Air Pollutants: technology-based standards list of hazardous air pollutants; emission standards and reductions; materials re-use and recycling, collect-capture-treatment technologies

Title IV- Permits: monitoring and reporting regulations, annual fees for specific types and levels of emissions

Title V- Acid Deposition Control: long-range strategy for reduction in emissions, energy conservation and pollution prevention of sulfur and NOx sources; clean coal technologies

Title VI- Provisions Relating to Enforcement: relating to administrative orders, compliance certification, contractor inspections, contractor licensing, citizen suits,

Title VII- Miscellaneous Provisions: grants for support of air pollution planning and control programs, NOx and VOC study, review and revision of criteria and standards, air pollutant release investigation board

SJ Res 88 "National Global Warming Policy Act" (Wirth)

This resolution states that it is U.S. policy to reduce greenhouse gases by the year 2000 to 20% of 1988 levels and to encourage international efforts through an international summit on global warming and global change; that there is to be federal agency participation to determine the impact of global warming on their missions and activities; that efforts are to be made to protect the rainforests; and that the U.S. must focus on the development of

new technologies for a reliable energy supply. To expedite the passage of this bill, the 20% CO_2 reduction will be replaced by a three-step plan to "stabilize emissions as soon as possible." The three steps include 1) the development of policies to stabilize CO_2 and other greenhouse gas emissions; 2) further reduction assessments of substances other than those controlled by the Montreal Protocol; and 3) a study of the feasibility and economic, energy, and environmental implications of a 20% reduction by 2005.

S 169 "National Global Change Research Act of 1989" (Hollings)

This bill amends the "National Science and Technology Policy, Organization, and Priorities Act of 1976" and introduces a federal research program to assess the cause and effect of global climate change over a 10-year period. The results of the study will assist the EPA in formulating a coordinated national policy on global climate change.

S 201 "World Environment Policy Act of 1989" (Gore)

This bill establishes the council on World Environmental Policy giving federal agency support to bi- and multi-lateral aid institutions to advise the President on foreign and domestic world environmental problems and publish reports on progress made toward scientific research goals. This bill includes the following issues as components of environmental policy: public awareness of environmental matters, regulation and phase-out of ozone depleting substances and their schedule for reductions; vehicle fuel efficiency improvements; waste minimization and recycling technologies; international efforts through the World Bank for sustainable economic growth in developing countries; conservation of world biodiversity; and population growth control measures through assistance to family planning organization assistance.

S 251 "Global Environment and Climate Change Assessment Act of 1989" (Moynihan)

This bill establishes a task force on research and assessment of the changing environment to carry out a comprehensive 10-year program plan to gain an accurate understanding of the cause and effect of global warming, the probability of its occurring, and the accumulation of information necessary to make the best response judgements. The force will comprise chairmen from departments, agencies, and other related organizations. The report findings will undergo public, congressional and presidential reviews before finalization.

S 324 "National Energy Policy Act of 1989 (PURPA)" (Wirth)

This bill sets down a National Energy Plan for developing and deploying safe, reliable, and cost-effective alternative energy sources. It establishes the Office of Climate Protection within DOE for global climate change analysis of domestic and international activities, policies etc. Included in the bill are provisions for research efforts into nuclear, fusion, coal and natural gas energy alternatives; natural resource policy to study the ecological and environmental resources affected by global climate change (i.e., wildlife

habitat, species); science initiatives for agency and organizational support of research efforts; and development assistance for a tropical forestry program to conserve and reclaim tropical forest areas.

S 333 "Global Environmental Protection Act of 1989" (Leahy)

This bill formulates policy in the areas of elimination and regulation of global change pollutants including CFCs and related chemicals and tropospheric ozone; vehicle production and emission standards; clean fuel research and development; atmospheric protection; and international cooperation on global change issues.

S 491 "Stratospheric Ozone and Climate Protection Act of 1989" (Chafee)

This bill deals with those atmospheric pollutants causing the depletion of the ozone layer and climatic changes. It restates the policy to reduce and or eliminate the production and emission of CFCs; develop and deploy energy-efficient alternatives to fossil fuels; establish standards and requirements for the recapture, recycling and safe disposal of emissions; and import bans on the listed substances or products manufactured with those substances.

S 603 "Global Warming Response Act of 1989" (Boschwitz)

This bill establishes the Office of Global Warming in the State Department to coordinate U.S. global warming policy and response matters. It comprises of members representing the secretaries and administrators of relevant departments and agencies and has the mission of developing a global warming strategy plan to maintain worldwide biodiversity through economic incentives, technical assistance, train and education, assist in global sustainable economic development, research and development on policy responses to global change matters, establish programs for forest preservation, promote reforestation and sustainable forest resources, participate in international negotiations on the control of greenhouse gases and increased global energy efficiency.

S 676 "Global Environmental Protection Act of 1989" (Baucus)

This bill is a revision of the "Global Environmental Protection Act of 1989" introduced by Senator Leahy. It accompanies the "Global Stratospheric Ozone and Climate Preservation Act of 1989" and restates the following policy areas for the elimination and regulation of global change pollutants: safe substitutes, reporting regulations, production phase-out dates on the listed substances, ban on the import of such substances, and research into technologies to reduce and later stabilize levels of CO_2. This act also recounts the efforts for global change adjustment and mitigation, atmospheric protection, international cooperation in the development and deployment of non-polluting energy sources worldwide.

S 870 "Consumer Ozone Protection Act of 1989" (Gore)

This bill proposes actions taken to label, regulate and possibly eliminate the sale of certain products known to deplete the ozone layer. It also introduces a Chlorofluorocarbon and Halon Reclamation Plan to encourage the recapture and recycling of ozone-depleting substances.

S 871 "Ozone Layer Conservation Act of 1989" (Gore)

This bill calls for a manufacturer's excise tax on certain ozone-depleting chemicals and establishes an Ozone Layer Trust Fund within the Treasury Department in which half of the tax revenues would be directed to promote research and development, and market incentives for alternatives to ozone depleting chemicals.

S 872 "Upper-Ozone Chemicals Act of 1989" (Gore)

This bill provides for a 5-year phase-out of six ozone-depleting substances and a 10-year phase-out of other substances, with exceptions for medical and national security reasons. It also requires a certification measure for nations exporting these chemicals or their subsequent products to the United States to have similar phase-out programs in place and a safe disposal system for these substances.

Untitled legislation:

HCR 44 (Bates)

As a method of reducing CO_2, this bill proposes that the International Bank reduce the burden on debtor nations that implement programs to protect tropical rainforests.

HR 503 (Stark)

This bill requires the labeling of products manufactured with CFCs. Those without labels will be considered a misbranded hazardous substance and will be subject to the penalties of the Federal Hazardous Substance Act.

HR 842 (Coble)

This bill authorizes the President of the United States to maintain membership in the International Tropical Timber Organization (ITTO), an organization to promote cooperation between timber-producing and -consuming nations. The premise of this bill is that 1) ITTO is important because tropical rainforests are an important component of world trade, and unchecked tropical deforestation disrupts the indigenous culture in affected regions, and 2) the rapid rate of tropical deforestation is growing at a rapid rate with the impact of contributing to the greenhouse effect.

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