Preface

The purpose of this assignment is to outline the Kyoto Protocol, and its reason for existence: global warming.

Global warming is a pressing issue that has only become more prevalent in the world as the years have passed. Global warming is defined as "the gradual increase of the temperature of the earth's lower atmosphere as a result of the increase in greenhouse gases since the industrial revolution" ("Global Warming" http://www.answers.com/Global%20Warming). It is a "modern problem"; a complicated issue that has ties to different facets of the world, such as poverty, economic development and population growth. It is also present in the media, politics and people's everyday lives. Though many scientists believe that it is through the fault of humans that the planet now faces this problem, not all agree. Some believe that it is a natural occurrence on Earth, and that it has happened before.

To try and minimize the effects of global warming, the Kyoto Protocol was created. It has just recently come into effect on 16 February 2005 for those countries that are a part of it. It is "an international and legally binding agreement to reduce greenhouse gas emissions world wide" ("Kyoto Protocol definition" http://unfccc.int/2860.php). This Protocol has also caused controversy, as some believe that it is too strict of a policy. They feel that it will only succeed in destroying a country's economy because of the all the changes that need to be made (like the U.S.). Others (like the European Union) have gladly ratified, willing to put as much effort into it as needed to help and eliminate this global issue.

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Summary

This report is an overview of global warming and the Kyoto Protocol. It offers a chronological background from when global warming first became an international issue, through the different conferences and the creation of the Kyoto protocol, until present day. The role of control, more specifically, who actually has power in this issue, and an explanation of why it is in that person's/group's/thing's possession will be discussed. A look at this issue on a global scale will be provided through three case studies of different areas around the world. These case studies will look at Japan, India and Cuba and detail their position in the Kyoto Protocol (whether they have ratified or not, etc.). It will also detail the country's status with regards to global warming. Canada's role in this issue will be taken into consideration, by looking at what our nation is doing to stop global warming. We will see the country's involvement with the Kyoto protocol, and separate programs it is running to help raise awareness and lessen greenhouse emissions. Possible solutions outside of the implementation of joining the Kyoto protocol, taken from the research of this topic, will be provided in the conclusion. This research relies on information taken from different sources. The Internet, books, media and articles all provide the details needed for this paper.

Background

Climate change has always been a part of the way the Earth works. In the past, it was natural factors that were responsible for warming the planet, but the changes would take centuries to transpire. Lately, in the most recent centuries, the speed at which climate change occurs has increased. The time of

this increase correlates to the start of the Industrial Revolution, in the mid-eighteenth century, to present day (see Appendix A). During this time period, the average temperature of Earth has risen by 0.6 degrees C, and is expected to rise by 1.4 to 5.8 degrees C more by 2100.

This climate change is attributed to the industrialization that took place over 2 centuries. During this time there was an increasing amount of burning of fossil fuels, use of certain farming methods and deforestation. More recently the use of Chlorofluorocarbons (CFCs) and other man-made chemicals, an increase in transportation, and even more deforestation have also been a large contributing factor to global warming.

The use of CFCs is actually what brought attention to global warming through the study of ozone depletion. In 1974, two chemists based out of the University of California, F. Sherwood Rowland and Mario Molina, discovered that this household chemical could rise up into the fragile ozone layer and slowly destroy it. They tried to warn the world, but the influence of an established multi-billion dollar industry outweighed their findings, and so they went unheard. It was not until 1985 where nearly half of the ozone disappeared over Antarctica did the world accept the evidence from fifteen years ago and begin to act accordingly (see Appendix B). This new awareness allowed the first step to be taken towards helping the planet (Sharon L. Roan 2).

On 16 September 1987 the Montreal Protocol, officially the Protocol on Substances That Deplete the Ozone Layer, treaty was signed in Montreal by 25 nations (168 nations are now parties to the accord). This protocol set limits on the production of harmful chemicals such as CFCs and halons. As years passed, the original protocol was amended several times at meetings in London (1990), Copenhagen (1992), Vienna (1995), and Montreal (1997). These amendments were designed to speed up the phasing out of ozone-depleting substances, and they have been doing their jobs. The production and consumption of halons was phased out by Jan. 1, 1994, and of CFCs, carbon tetrachloride, methyl chloroform, and hydrobromofluorocarbons by Jan. 1, 1996, except for those who are agreed essential users. Methyl

bromide was to be phased out by 2005 but a number of users of the chemical have won temporary exemption from the ban, and hydrochlorofluorocarbons are to be phased out by 2020 (phase out dates are later for developing countries) (see Appendix C) ("Montreal Protocol" http://www.answers.com/Montreal%20Protocol).

The Montreal Protocol was only the beginning. In 1988 when three percent of the ozone layer over the northern hemisphere was confirmed to be destroyed, it only strengthened the belief in the scientist's early claims, and more began to be done for to help the planet. In that same year of 1988, the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) established the International Policy on Climate Change (IPCC). Also in that year, two conferences took place: a United Nations General Assembly called *Protection of Global Climate for Present and Future Generations* took place, and the *Toronto Conference on the Changing Atmosphere*.

In 1989, *the Ministerial Conference on Atmospheric Pollution and Climate Change* was held in Nordwejk, Netherlands. One year later the *Second World Climate Conference* was held in Geneva from 29 October to 7 November. In 1991 the *First Intergovernmental Negotiating Committee* (INC 1) was chaired by Jean Ripert from France. These committees continued to meet throughout the 1990's under different chairpersons, and eventually adopted the United Nations Framework Convention on Climate Change (UNFCCC) on May 9, 1992.

The UNFCCC was presented for signatures at the United Nations Conference on Environment and Development (UNCED). The conference was also known as the *Earth Summit*, and was held in Rio de Janeiro, Brazil, on June 4, 1992. The framework was entered into force less than two years later on March 21, 1994. Since that time, the members of the framework have met every year in conferences known as the Conferences of the Parties (COP). There, they watch the execution of the framework and continue to discuss what else can be done to stop climate change.

In 1997, five years after the UNFCCC was signed, the Kyoto Protocol as the other international agreement was adopted as an extension of the UNFCCC. The Kyoto Protocol is "a legally-binding commitment to developed counties to reduce their collective emissions of six greenhouse gases by at least 5% compared to 1990 levels by the period 2008-2012." ("Climate Change Information Sheet 1" http://unfccc.int/resource/iuckit/fact01.html) (see AppendixD). Essentially, it is a more strict set of rules for the countries that signed it, committing them to certain expectations by a set time. All members of the UNFCCC signed the Kyoto Protocol in 1997 in Kyoto, Japan. However, before this plan can officially take effect, enough countries have to ratify the plan so that 55% of the total 1990 CO_2 emissions are taken responsibility of. This will allow the countries to work towards lessening the overall total emissions. At this time, the countries with the highest emission level were those in North America, specifically the U.S. (see Appendix E)

All of the members of the Kyoto Protocol are divided up into three different Annexes according to whether or not it is a developed nation. Annex I Parties (see Appendix F) are industrialized countries that were members of the OECD (Organization for Economic Co-operation and Development) in 1992. They can also be countries that have economies in transition (the EIT Parties), including the Russian Federation, Eastern European states, etc. Annex II Parties consist of the OECD members of Annex I, but exclude those who are of the EIT Parties. These countries are required to provide financial resources for developing countries to help prepare those countries to face possible climate changes in the near future. They also must promote the development of environmentally friendly technologies to EIT Parties and developing nations.

Non-Annex I (see Appendix G) mainly contains developing countries. Most of these groups are vulnerable to global warming in some way or another, be it through the possibility of a change in climate affecting them (ex: warmer weather), or the laws against greenhouse gasses (losing business in fossil fuel production). The convention emphasizes activities that will help with the needs and concerns of the

countries, such as investment, insurance and technology transfer. There are even the least developed countries (LDCs) that have special consideration because of their limited ability to respond to climate change or adapt to its effects (see Appendix H. When considering these countries, the larger nations are expected to help with funding or providing new technology to help lessen the effects of global warming ("The Criteria for the Identification of the LDCs" http://www.un.org/special-rep/ohrlls/ldc/ldc%20criteria.htm).

With the creation of this segregation came voices of concern. Many believe that not having the Non-Annex I parties clean up their countries is a mistake, as many of the countries (ex: China, India, and Russia) are some of the largest carbon-dioxide emissions producers in the world. How can the other countries hope to cut down the harmful emissions entering the atmosphere, if they aren't the ones responsible for most of the damaging gases?

On the 16 February 2005, after years of waiting, the Kyoto Protocol came into effect with approximately 61% of the greenhouse gases covered by countries. Most of the signed countries held parties in honour of the beginning of the Kyoto Protocol. This instatement of the protocol was made possible thanks to Russia signing the protocol on 18 November 2004. That signature effectively boosted the percentage of claimed emissions over the 55% requirement. It is now up to the countries to work hard at reducing greenhouse gases to 6% less than what the emissions were in that country during 1990 before the year 2012. In total, a reduction of 2.5 billion tons of carbon emissions is expected. If all meets this goal, the planet may have a possible chance at recuperating ("Kyoto-Entry into Force" http://unfccc.int/meetings/kyoto_eif/items/3363.php).

Most of the things the Kyoto Protocol is trying to prevent are already happening on some sort of scale on the planet. With the increase of the Earth's temperature, there have already been some changes to the environment. The sea level has raised an average of 10 to 20 cm during the 20th century, due to the melting of the polar ice caps and an increase in temperature (heat causes the volume of the ocean to expand) (see Appendix I). Predictions have also been made that a change in climate will cause extinctions

of both plants and animals, lower crop yields in tropical and temperate regions, and more extreme weather conditions (ex: recent Indian Ocean Tsunami) (http://unfccc.int/essential_background/items/2877.php). There is also increased risk of damage to the human body, with the increase in UV rays making it through the ozone layer. Skin cancer, cataracts, increase in deaths and heart strain are just a few ways in which a warmer climate or increase in harmful rays from the sun can affect a person.

Role of Control

Within the Kyoto Protocol and global warming, there are many different people/groups that have power over others.

One of the biggest areas that gives people power in this whole subject is the language when discussing anything relating to Global Warming. Scientists, lawyers, researchers, etc. all know what CFC or UNFCCC means, but the general public most likely does not. Unless someone is directly involved with global warming, a person doesn't really have the opportunity to learn all the details of complex issues like Global Warming or the Kyoto Protocol. This can be very isolating for a country's citizens, because how can someone help if the situation isn't understood? This is a detriment to the Kyoto protocol, because even if

the country is working towards being cleaner, how will the society know what to do if the information is not given out.

Another power holder would be world-leaders. They have the power to say "yes" or "no" to the Kyoto Protocol or any other type of agreement like it. Take, for example, the U.S. with regards to the Kyoto Protocol. President Bush was the one who rejected the Protocol because it is a threat to the economics of the country. Despite being the largest emitter of greenhouse gases on the planet, the country is able to get away with not joining an agreement that was created to stop what it creates so profusely. The only reason why the country can get away with this is because of the power the States has in the world today.

Another reason the U.S. is able to say no is because it is a developed country, which also gives it power. Developed nations have more power than developing nations. This is because developed nations are better equipped to stand up against climate change than developing ones. They have the natural resources and the money to be able to adapt in different ways to the changes in climate.

The Kyoto Protocol has power over those who have joined. It is a more legally binding agreement than any before it. Countries are fixed on a deadline for when and by how much greenhouse gasses must be reduced. Countries are also committed to coming up with their own plans of actions for battling global warming on their land. Creations such as Canada's "Drive Clean" program or Japan's "Basic Plan for Energy Research and Development" are results of these requirements.

Case Studies

The Case Studies that will be presented in this section are of three different countries from around the world: Japan, India and Cuba. Each Case Study will showcase the involvement of each of the countries in the Kyoto Protocol. It will also look at the efforts of each in trying to lessen the effects of Global Warming in the world.

1. Japan

Japan signed the Kyoto Protocol on 28 April 1998, and ratified it on 4 June 2002. It is a member of both Annex I and II. It is the country where the city of Kyoto is, the city in which the Kyoto Protocol was signed in 1997. One would think that because of that

Japan is one of the more significant contributors to greenhouse gases; yet it could easily pass the blame to those countries that it imports 80% of its used energy from. Since Japan only has the control over 20% of the energy it uses, a major solution to Japan's emission problems is to produce their own energy sources that would be cleaner for the environment. They could easily implement wind or solar powered generators to provide energy for themselves that does not involve the use of fossil fuels. Japan has already helped in contributing to the solution of this problem by introducing oil substitutes.

Throughout the 1960's and into the 70's, Japan experienced a period of rapid economic growth. The result of this economic growth was that its energy consumption increased substantially. However, during this time there were two major oil crises that caused Japan to look at its consumption and adjust accordingly. Since the first oil crisis, the energy consumption in Japan has been extremely low compared to the standards of industrialized nations' standards. From 1973 to 1986, the energy consumption levels generally went down in the industry because of the first oil crisis.

Although the total emissions have continued to rise in the early 1990s, per capita carbon dioxide emissions are lower because of the generally temperate climate, geographical "make-up" and its good economy. This country has forests that cover 67% of the land, which aid in reducing the amount of carbon dioxide enters the atmosphere. In addition, Japan has made efforts to reduce consumption ever since the first oil crisis, giving it greater energy efficiency.

Membership to the United Nations Framework Convention on Climate Change requires a national program to be put into place. Japan's national program, the *Action Program to Arrest Global Warming*, was adopted in October 1990 by the decision of the Council of Ministers for Global Environment Conservation. The Report outlines the government's orientation in the short term and an outline of the measures it will take to enforce in the future, clarifies the basic approach toward making Japanese citizens understand, and contributions within the international framework.

The Industry sector accounts for about half of Japan's carbon dioxide emissions. Measures have been taken to improve and better apply standards related to the rationalization of fuel combustion. Japan is also working to assist investments in energy-saving capital equipment through special taxation measures and low-interest financing. The development of energy-saving technology has been promoted under the Energy Conservation Law since the first oil crisis.

The Energy Conservation Law was first passed in 1979 after the two oil shocks of the 1970s. The first oil shock was at the peak of Japan's period of high economic growth, when the energy consumption was high and Japan heavily relied on oil. Instead of promoting the use of other energy sources, the Energy Conservation Law's goal is to improve the energy efficiency of factories that use a large amount of energy, as well as the efficiency of products such as domestic appliances and automobiles.

After the Energy Conservation Law passed after the first oil crisis, it was revised in 1999 after it adopted the Kyoto Protocol at the 3rd Session of the Conference of the Parties (COP3) in 1997. The 1999 edition was supposed to reduce energy usage, but the energy consumption of buildings such as office blocks, large retail stores, hotels and hospitals, has actually increased from 1999 (to 2003).

As a consequence of this, the law has been revised again. The new law requires that the above types of buildings submit an energy use plan to the authorities, to keep records of their energy consumption and to report the records to the authorities. Those who do not follow the requirements will be served the consequences.

The law is expected to improve energy efficiency at commercial facilities. The law is an important step since commercial facilities are generally more difficult to regulate than industrial facilities because industrial facilities (Japanese Government http://www.jijigaho.or.jp/app/0307/eng/gov_news01.html).

Despite all of Japan's work in the industrial sector, energy consumption is tending to rise in both the residential and the commercial or institutional sectors. This is due to advances in office equipment, and the wider used and growing capacity of electric home appliances.

As a result of this rise, Japan is taking some measures to ensure that emissions are lower in these sectors. One measure is that standards related to insulation in construction are being improved and more strictly applied under the Energy Conservation Law and steps are being taken to assist builders through extra financing. Other measures are that the Energy Conservation Law standards for home appliances and office equipment are being strengthened, and the promotion of using new forms of unused forms of energy

through extra financing. Cities are also planting more greenery to attempt to make its citizens think that it is not as hot as it really is, and therefore eliminate their need for air-conditioning. Also, the planning of cities that emit little carbon dioxide is being promoted using subsidies from the national treasury and other means.

Transportation in Japan is accounts for a large and growing proportion of energy consumed. Japan is thus taking measures directed at the energy sector. One of these measures is that the carbon dioxide emissions from cars are being curbed. This is being achieved by strengthening standards of 1993 related to vehicles under the Energy Conservation Law. Japan is using national treasury subsidies, special taxation measures and other sources of money available to promote the introduction of low-emission cars. Another measure is that improving services and promoting the use of railway and coastal shipping are increasing the efficiency of freight transport. Again, interest-free loans, special taxation methods and other sources of money are being used by Japan to do this. Increasing railway transport capacity and stimulating bus transportation are promoting the use of public means of transportation in passenger traffic. Transportation systems that generate less carbon dioxide are being created by improving cars and to help lessen traffic through two Plans: The eleventh "Five Year Road Improvement Plan" (1993) and the fifth "Specific National Five-Year-Project for Traffic Management Systems Installation" (1991).

The "Basic Plan for Energy Research and Development" promotes the development of technology for solar and other new and recycled forms of energy and fuel cells. They intend to improve the efficiency of power generation by thermal power plants and to promote energy sources such as nuclear power and hydropower that generate less or no carbon dioxide. Measures are being taken to support the development in these fields through low-interest financing and special taxation measures ("Japan: Environmental Issue" http://www.eia.doe.gov/emeu/cabs/japanenv.html).

As a member of the Kyoto Protocol, Japan has made major progress with the prevention of climate change and provides an example to other countries through the regulations and laws it has made so far.

2. India

India ratified the Kyoto Protocol on 26 August 2002. It is a part of Non Annex I as it is a developing country. This means that India is not required, for now, to reduce emissions of greenhouse gases under the Protocol.

This could be seen as a problem, as India is the fifth largest emitter of greenhouse gasses, and yet has no obligations to fix that. They could easily hide behind the fact that they have already signed and ratified the Kyoto Protocol, and are therefore helping the Earth without actually having to do anything.

It seemed like India would be taking this route when an article was released prior to the instatement of the Kyoto Protocol. The article stated that India, China and the U.S. combined were planning to build a total of 850 coal-fired plants. This large spike in coal-fired plants can be linked to the rising costs of natural gases, compared to the low costs of coal. If this were to be done, the plants would create five times as much carbon-dioxide emissions than the amount that the Kyoto Protocol is now trying to have the world reduce by 2012 (see Appendix J). At the time that this article was written, India was planning to build 213 of the 850 plants to provide energy for the country. Fortunately, many of the plants had not been confirmed yet, and so there is still a chance that such a drastic plan will not be put into effect, or at least not to the same magnitude. If the plants were built it would reaffirm people's beliefs that the Kyoto Protocol isn't going to be able to be effective when it doesn't limit the emissions coming from Non-

Annex I countries (China and India) or get the support of the larger carbon dioxide emitters in the world (the U.S.) ("New Coal Plants Bury 'Kyoto'" http://www.csmonitor.com/2004/1223/p01s04-sten.html).

However, more recently, many experts suggest that India will not be one to just sit back and relax in this situation. The country could "benefit from the transfer of technology and additional foreign investments into sectors like renewable energy, energy generation and forestation projects" ("India stands to gain from Kyoto" http://www.climateark.org/articles/reader.asp?linkid=40933).

Now that the Kyoto Protocol has been implemented, India is also able to take up clean technology projects with outside help in "accordance with national sustainable development priorities" (http://www.climateark.org/articles/reader.asp?linkid=40933). These projects are for creating alternate energy sources in India, and the country has many in progress or in the planning stages. They are called certified development mechanisms (CDMs), and include a whole range of interesting plans to provide "clean" energy for India. Examples of CDMs are using biomass to power electricity generation, converting municipal solid waste to energy and bagasse (the dry dusty pulp that remains after juice is extracted from sugar cane) electricity cogeneration from sugar cane processing. "India has developed more CDM methodologies and project proposals than any other country. Along with Brazil and China, they have the greatest potential for the new mechanism." ("India Stands to Gain…" http://www.climateark.org/articles/reader.asp?linkid=40933). Reportedly, India is the home to 150 CDM project documents, which has been developed largely with just the country's own funds. This can be compared to only 200 CDM projects being present in other areas of the world.

India's success in developing CDMs has attracted the attention of many of the larger countries and companies (Canada, Germany, Japan, Britain, the World Bank and the United Nations Development Program) who would all like to help build the capability of India to continue creating CDM projects. It has been estimated by the National Strategy Study (a World Bank project) that after this support, India's share of the CDM market could be at least 10 percent, earning profits of up to $100 million per year.

Also because of India's success at finding ways to cut down on greenhouse gases through alternate forms of energy, they could be looking at making a large sum of money through the carbon market. The carbon market allows countries that may be having trouble reducing emissions, to send carbon to other countries that are under the limit to be absorbed, or included in the final tally of emissions for that area. With the current rate of $6 per tonne, India would make a lot of money in the near future for taking responsibility of other countries unwanted emissions.

All that India is doing is extremely important to its future. India is a rapidly industrializing nation with a fast growing population. There have already been signs of the effects of global warming in the country, with heat waves coming and going, smaller crop yields, and large smog clouds over major cities. If these are allowed to continue to manifest, the citizens of the country could suffer greatly. Already people have died because of heat stroke due to rising temperatures, had to deal with famine because of poor crops, and are having difficulty breathing because of the smog. India needs to continue working on ways to lessen its emissions so that the people that call that country home are healthy ("India: Clouds Get in the Way" http://www.findarticles.com/p/articles/mi_m1594/is_5_11/ai_65913641).

As a member of the Kyoto Protocol, India is showing great promise in working towards finding other methods of producing energy. It is an inspiration, especially since it does not have an obligation to lessen the greenhouse gases that it contributes to the world.

3. Cuba

Cuba is a member of Non Annex I, and so like India, it legally has no obligations to lessening the harmful emissions that are infecting our environment. Having said that, Cuba has been a strong supporter of the Kyoto Protocol ever since it'd introduction, and continues to help to this day. It signed the Protocol on 15 March 1999, and ratified on 30 April 2002.

Since Cuba is an island country, it is among the most vulnerable to the climate change effects of global warming. A possible rise in sea level, prolonged droughts and more powerful hurricanes could plague the island if the degree of the situation gets worse. Luckily, Cuba is trying to stop that fate by working towards lessening greenhouse gas emissions.

Cuba was never a really large contributor to greenhouse gas emissions, and in 1994, it was actually registered as a net absorber of emissions. This was linked to the collapse of the Soviet Union, its main trading partner in 1991. That collapse meant a grave economic crisis for Cuba. The result was a 45% drop in production in key economic sectors (the sugarcane industry) and those with high emission levels (the iron and steel industry) getting hit the hardest. Another contribution to the huge cutback in emissions was because Cuba had implemented a more efficient energy policy and better use of national energy sources.

More recently Cuba has been looking to implement more policies that will keep the emission levels of the country low, the most significant being an extensive reforestation plan for the island. The programme is designed to increase the vegetation population in Cuba from 23.4 percent to 29.3 percent by 2015. This translates to a growth from 2 572 000 hectares to 3 254 700 hectares, which is an increase of 682 700 hectares in just ten years. Although the nation has developed the information and trained workers needed for this project, there supposedly has been no submission of the final proposal to enter into this new market.

The planting of trees in Cuba will allow the country to create carbon "sinks", areas where a group of trees and/or fertile soils can remove carbon from the air to lessen the amount entering the atmosphere. It is one of the more inexpensive and effective ways to fight global warming and climate change. A recent study also showed that it is less expensive to be creating carbon sinks in the south, compared to in the northern countries (Canada, the U.S., etc.). This is because the price of planting trees in a northern country is much more expensive than it is when you are in Cuba. For example, it would cost roughly 100 to plant trees to absorb one tonne of carbon in the United States, while it would be about half of that in Cuba.

The creation of these sinks would reduce carbon dioxide emissions in Cuba even more, and they would is also play an important role on Cuba entering the carbon market. Since Cuba is already registered as a net absorber of greenhouse gases, they would easily be able to accept carbon quotas from other countries for a price. This would especially help the Cuban economy, since it has been in a slump ever since the disintegration of the Soviet Union. It would provide the country with a new commodity by which money could be made to support the country. It would introduce new jobs like carbon brokerages and consultancies, and emissions verification services.

However, whether or not Cuba enters into the Carbon market is not a sure thing. There are many specialists in Cuba that do not see the carbon market as a real solution to any of the environmental problems. Instead they see it more as a negotiating tool, and they believe that it will not actually rid the world of carbon dioxide, just relocate it. ("Cuba Wants to Enter the Carbon Market" http://www.ipsnews.net/interna.asp?idnews=26673).

As a member of the Kyoto Protocol, Cuba has a tough journey ahead of it. It is already off to a good start with being recognized as a net absorber of carbon emissions, but will it actually put its forestation plans into effect and enter the carbon market? Or will the country look at other options to allow it to be an effective member of the Protocol?

Canada's Role

Canada signed the Kyoto Protocol on 29 April 1998 and ratified it on 17 December 2002. It is a member of both Annex I and Annex II, and therefore is obligated to cut its emissions down by 6% from its 1997 tally for 2012 (see Appendix K).

In 1997 Canada was ranked as the third largest contributor of greenhouse gases, following the U.S. in first, and Australia in second (see Appendix L). It also "produces more fossil fuel emissions than any other country on a per capita basis" (CBC News in Review 2002 23). This can be linked to the type of country Canada is. Having a colder climate requires more energy to heat the homes and building of the country, which is a process that releases carbon dioxide into the atmosphere. Another reason for the high levels of emissions would be the size of Canada. It is the second largest country in the world, so it takes more fuel to travel from one place to another, with the exhaust from the vehicles contributing to the total amount of carbon dioxide emissions.

The high amount of emissions coming from Canada is why it was imperative for Canada to join the Kyoto Protocol. However, that decision wasn't the easiest to make. Support for the Kyoto Protocol has been split in Canada in the past, with it causing riffs between provinces, political parties and businesses that were either for or against the Protocol.

Support for the protocol was found in the provinces of Manitoba, Quebec, Nunavut, the Northwest Territories, and British Columbia. Other supporters were Greenpeace Canada, insurance companies, banks and the Liberal, New Democrats, and Bloc Quebecois political parties. The reasons for support were: Canada can reduce greenhouse gases more cheaply if it works within the context of an international system, it would give the Kyoto Protocol a presence in North America, the benefits will outweigh the costs, the costs of not acting include the costs of droughts, floods and poor health, and ratification of the Kyoto

Protocol does not need provincial consensus since international agreements are within the scope of Canadian federal government powers

The main opposition against the Kyoto Protocol in Canada came from large oil companies, large industry groups such as the Canadian Chamber of Commerce, the Alberta Provincial Government, and the Canadian Alliance and Conservative political parties. The main reasons for resistance were: the costs are not yet known, and will be too high, the Kyoto Protocol would add a financial burden to Canadian companies that their US counterparts do not have, the provinces have not been consulted on the details of an implementation plan, may cause job loss and it has unfair requirements for large oil and gas companies to make expensive changes to plants. The opposition even proposed a "made-in-Canada" policy with similar goals as the Kyoto Protocol, but with deadlines extending to 2020, so that it is easier on oil companies ("The Kyoto Protocol and Canada" http://canadaonline.about.com/library/issues/blikyotoprocon.htm).

Despite the efforts of the opposition, the Kyoto Protocol did get ratified in Canada, and there is now a concrete plan made by the Canadian government for reducing greenhouse gas emissions in this country. It is called Project Green, and was first introduce in Ottawa on 13 April 2005. It is a "national project to create a healthier environment and a stronger economy by combining the efforts of all Canadians to build a more sustainable future" ("News Release: Launch of Project Green" http://www.climatechange.gc.ca/english/newsroom/2005/plan05_NR.asp).

What is meant by that statement is that when reducing greenhouse gas emissions, a benefit will be reductions of other pollutants. This will ensure cleaner air across Canada and an improvement in Canadians' quality of life and health, especially for the most vulnerable: seniors, children and others who suffer from respiratory diseases like asthma. The government also believes that the strong focus on the environment will create a comparable commitment to economic growth and a competitive economy.

This plan will invest $10 billion between now and 2012 to fully realize the expected decrease of about 270 megatonnes of greenhouse gas emissions. It also commits the Government of Canada to annual assessments of climate change initiatives and investments. Funding will be reallocated as necessary to ensure that measures are effective and cost-efficient, and that only actions resulting in greenhouse gas reductions are being funded. The Government of Canada is also committed to working in partnership with provinces and territories, aboriginal peoples, industry, environmental groups and all Canadians on the overall direction of the Plan and the implementation of the key elements. ("News Release: Launch of Project Green" http://www.climatechange.gc.ca/english/newsroom/2005/plan05_NR.asp).

Even though Canada got off to a shaky start with the Kyoto Protocol, it seems that the plan that is coming into fruition now holds promise for the future of this country. Hopefully with it, Canada will have success in making this country a cleaner place to live, and a place that does not have such an impact on the environment. In doing so, it may be able to become a leader in creating a healthier environment for all to live in, so that the rest of the world has a plan to follow.

Conclusion

Global Warming is an issue that has no limits, and affects everyone in this world. With the introduction of the Kyoto Protocol, there is finally a chance to do something to stop the spread of a problem that could destroy our planet.

The countries of the world need to work hard at putting this opportunity to good use. Utilizing the prospects the Kyoto Protocol is offering is integral for this program to be a success. Sacrifices may need to be made, but it is all for the good of the cause, after all what would be worse? Suffering a little bit to get a planet back into good health, or to be greedy and soon not have a planet that can sustain life?

It isn't just up to the governments of the countries to make changes to help the environment; everyone is capable of doing something. There are many changes that can be made in a home or in a community that would benefit the Earth. For example, there are new hybrid cars on the market that use much less gas to get around, instead relying more on a electric engine to give most of the power. If people are looking at buying new cars, it would be easy to choose one of the hybrid models over a regular car. Speaking of driving, when someone has somewhere to go, if it's possible, why not walk or bike there? If more than one person is going to the same place, try to arrange a car pool so that fewer emissions are let into the air. There is also the option of using the city bus to get to wherever someone may need to go.

There are many things someone can do to outfit their home to make it more energy efficient. There is the installation of solar panels to help heat water, or provide electricity for the home. Living in a more rural allows the use of a wind-power generator to power a home. Many appliance companies now offer more energy efficient models, so why not buy those versions instead? Homeowners could try to recycle more, and have leftover nights to eat extra food instead of throwing it out.

Volunteering time to help the environment is also an option. There are many non-profit organizations that will organize park clean-ups, tree planting, etc. If there isn't an environmental awareness

volunteer group in your area, why not start one up? It will give people the chance to help that they may not have been getting before.

It is evident that there is a lot that can be done to help the environment, and some are simple as just

Creative Component

Watching

I have been here for centuries…watching, waiting, and growing. Stuck in one spot, unable to do anything about the horrors I have witnessed…the horrors that continue to this day. I am a tree, not that that matters to you. I am alive, not that that matters to you either.

I began life falling from the sky; I like to think the stork brought me. I settled into a warm cocoon in the earth that would nurture me until I was ready to grow. On the day that I broke out of my shelter, I revelled in the light; absorbing everything around me: colours, smells, sounds, and sights. I was a hungry infant, except I didn't want sustenance. I just wanted to take it all in.

Growing up I had what is needed in life; other trees around me, animals nesting in my branches, and enough sun to keep me healthy. Yet, try as I might, I was never really content. I only ever wanted to experience more, to dislodge my roots and travel the world, to see what was beyond the countryside I lived in.

There's the saying "be careful what you wish for", and now I wish I had paid more attention to it. What I wanted backfired. I would get to see different things in the years to come, but they would come to me, and they would not be pleasant.

It all started one summer day. It was the type of day when the sky is clear and blue, and the sun is out, beckoning everyone to just come and bask in its warm glow. The place people were beckoned to be was our grove, where they sat in the shade with a book, or went for a swim in the small brook nearby. It was when the sun was at its highest point that this peaceful afternoon was ruined. More people came to the grove, but not to enjoy the day. They made everyone leave, and then they pulled out large, shiny, sharp objects. They took these objects and started swinging them, imbedding them in the trunks of my nearby neighbours. I could hear their screams as they fell to the ground; saw their sap leek from their wounds as they grew silent. After hours of this it was over…I didn't know why I was still alive, but I was happy for it. As soon as I thought that I wish I hadn't. I immediately felt guilty for my fortune as I saw my old friends being chopped up and carried away.

That day set events into motion that continued at a whirlwind pace. Soon it was not just trees that were gone, but the flowers, the swamps, the animals…everything. And yet, for some reason, I remained, watching everything, taking it all in. Soon it was not men that were doing the destroying, but monstrous machines that would come in and reshape the land. Clouds of smoke drifted from these beasts, filling the air with smothering, sulphuric gas. Many more plants and animals died from this, and yet I was still there, absorbing it all.

From the changed land grew new plants…man-made plants. Cold boxes sprouted like weeds everywhere, crushing what was left of the wildlife. Black strips ran through the countryside like scars on the earth, and on top of them moving machines that moved the men faster than they could move themselves. The construction began creeping closer and closer to me, but instead of the big cold boxes growing here nicer, softer boxes were built. They didn't put the smog into the air either, instead families, like those that came to our grove before all this, lived in them. One was built very close to me, and soon, a fence was built too. I was now apart of this family. The kids would climb me, just like the squirrels used to, and the dad would sit under me, reading the newspaper (made from my dear friends) in the sun. The mother was my favourite though; she brought back some life to the home. She planted flowers and plants to accompany my looming figure in their yard.

I grew as this family grew, and I watched all of the changes occur. The moving machines, which I found out are called cars, changed quickly. They became sleeker and larger, but also put more choking fumes into the air. The same with the large boxes, called buildings. They became bigger, nicer to look at, but they produced even more choking fumes than before as well. These people were flourishing in their new homes, yet I noticed that they were more focused on themselves than what was around them. They took without consideration, destroying animal homes to create homes for themselves. What used to be a thriving home to many plants and animals was quickly over taken by humans. And it would be that way forever.

Time continued to pass, and I saw the children move out and then the parents sell the house. They sold it to a younger couple with no children, they were my family now. This couple was very fashionable from what I could tell. There had a different kind of car, which I snesed didn't put as much bad gas in the air. Unfortunately, the buildings further away were getting worse. They've grown bigger, taller even, with large stacks letting even more smoke than usual into the air. This heavy smoke is making it hard to breathe. Not because there's too little to breathe, but because there's too much for me to take in. I have to work overtime to try and fulfill my duties to the environment.

It's summer again now, but it doesn't feel like all of the other summers because it's hotter than it usually is. I find it uncomfortable being exposed to such heat all day long compared to years ago when there was nothing better than a good day in the sun. What worse than the heat is when it rains…it hurts me when it rains. It never used to do that, but now every rain drop that hits me is like the burning sensation I feel when getting pruned. I know it is not my fault that this is happening to me, it's these people; unknowingly they are destroying their home. What will they do when it's gone?

I'll be here to see how they react, because I'm always here. Watching. Will they realize the damage they've done before it's too late? Or will it consume them like they have consumed the natural resources of this planet?

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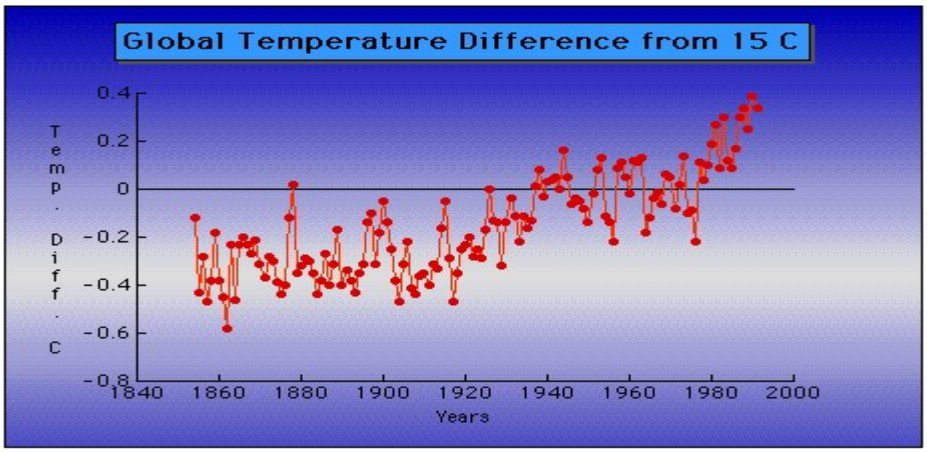
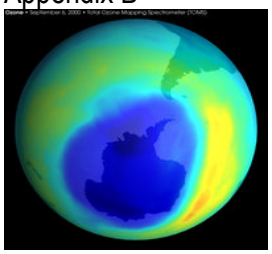
Appendices

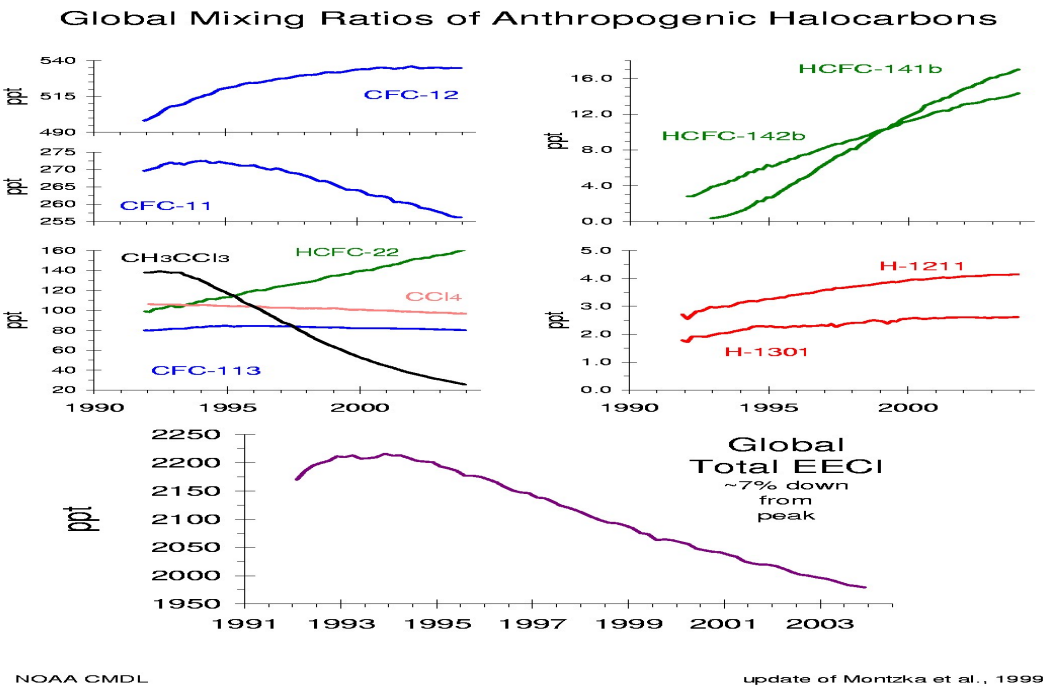
Appendix A



Appendix B



Appendix C

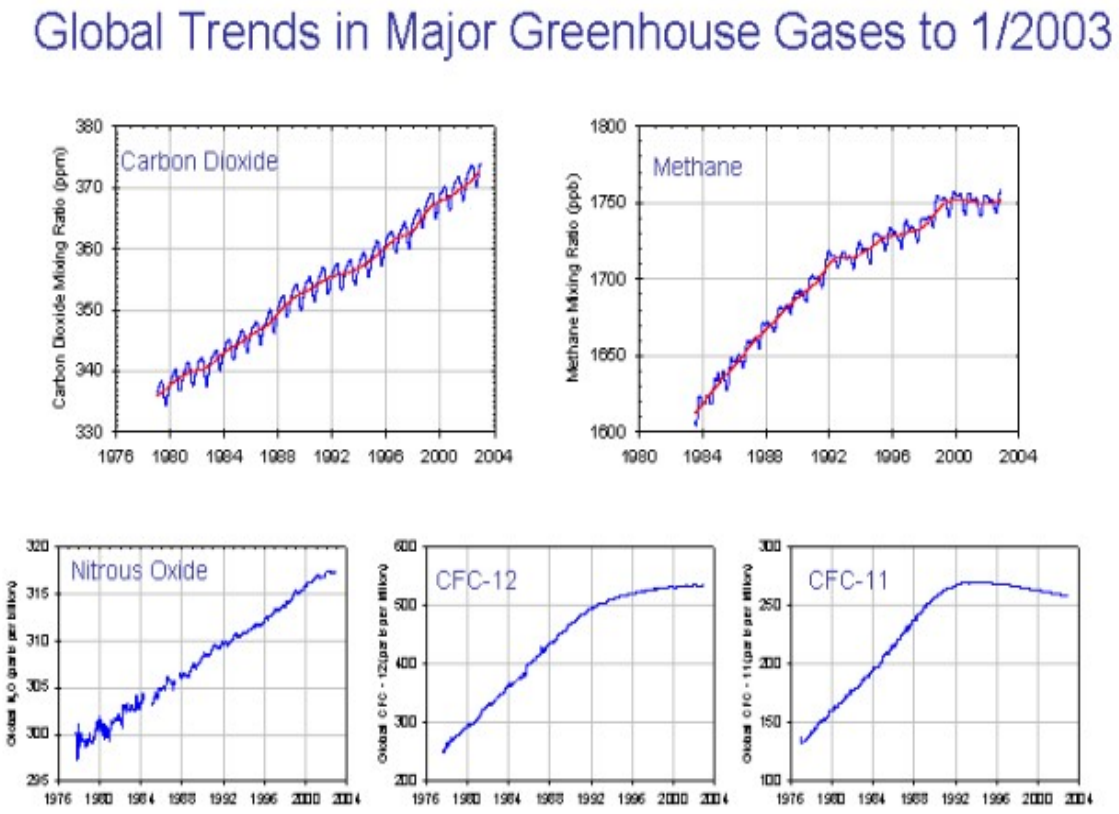


CFC gas trends and equivalent chlorine effect.

Combined chlorine and bromine in the lower stratosphere (10-25 km), where most ozone loss occurs, leveled off around 1999. Bromine is included as an ozone-depleting chemical because although it is not as abundant as chlorine, it is 45 times more effective per atom in destroying stratospheric ozone. Earlier measurements showed that the peak of **equivalent chlorine** (chlorine + 45 times bromine) had already occurred at the surface between mid-1992 and mid-1994.[1] (*http://larry.atomant.net/mediawiki-1.4beta5/index.php/Ozone_cfc_trends.png#endnote_CMDL20010206*)

The observed decrease is driven by a large and rapid decline in methyl bromide, a brominated gas that is regulated internationally by the Montreal Protocol. It is larger than that expected from model calculations as given in the WMO/UNEP 2002 Scientific Assessment to Ozone Depletion.[2] (*http://larry.atomant.net/mediawiki1.4beta5/index.php/Ozone_cfc_trends.png#endnote_CMDL20030815*)[3] (*http://larry.atomant.net/mediawiki-1.4beta5/index.php/Ozone_cfc_trends.png#endnote_CMDL27hats5*)

Appendix D



Global trends in major long-lived greenhouse gases through the year 2002. These five gases account for about 97% of the direct climate forcing by long-lived greenhouse gas increases since 1750. The remaining 3% is contributed by an assortment of 10 minor halogen gases, mainly HCFC-22, CFC-113 and CCl_4.

Appendix E

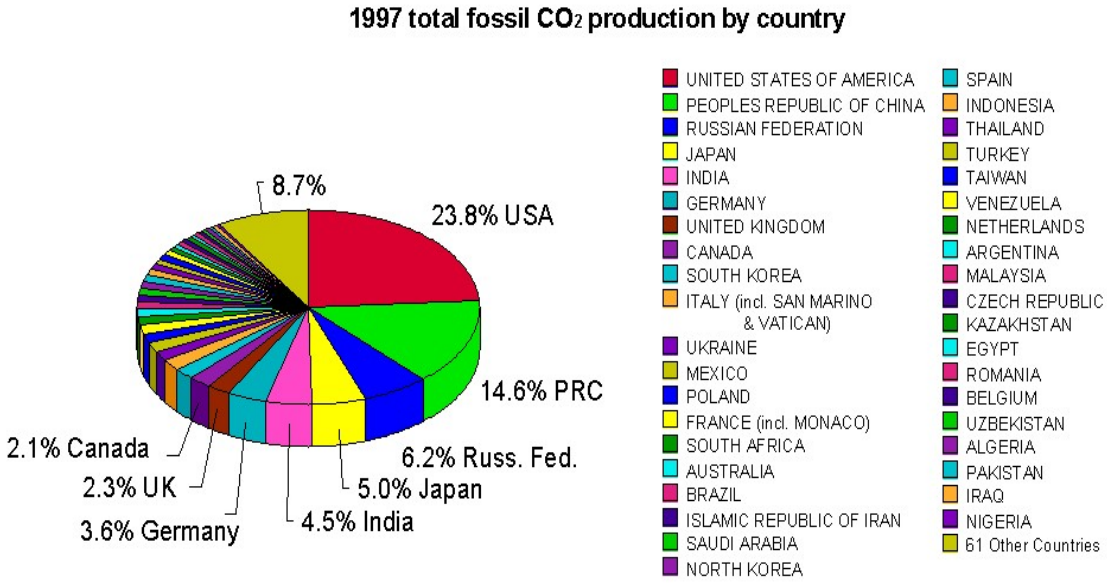


Figure by M. Horning based on Data from Gregg Marland and Tom Boden (Oak Ridge National Laboratory) and Bob Andres (University of North Dakota), available from the Carbon Dioxide Information Analysis Center (http://cdiac.esd.ornl.gov/)

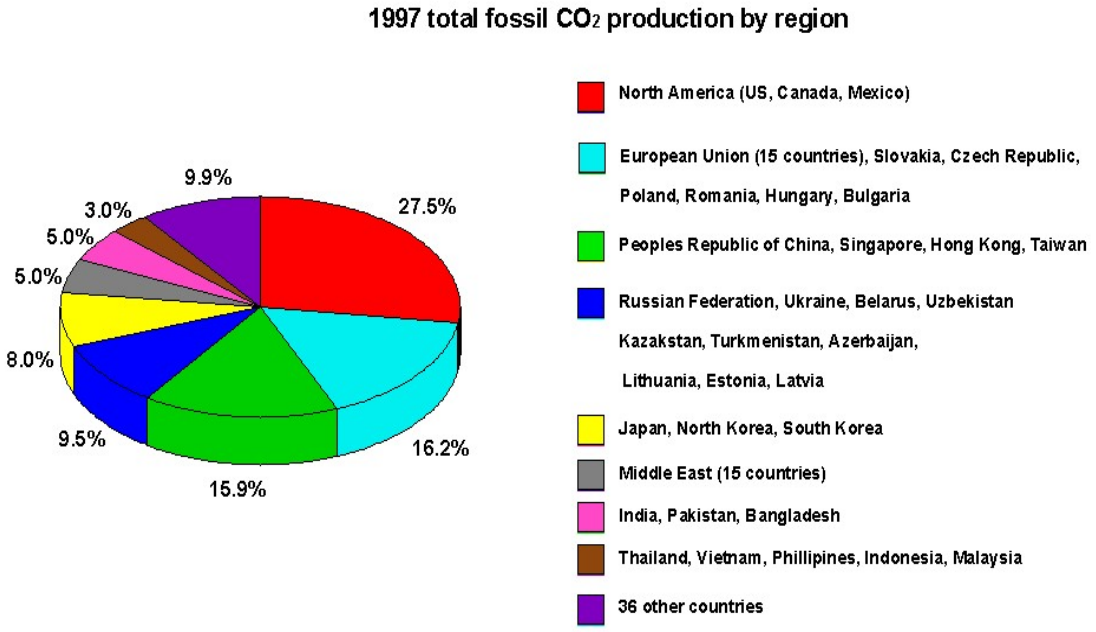


Figure by M. Horning based on Data from Gregg Marland and Tom Boden (Oak Ridge National Laboratory) and Bob Andres (University of North Dakota), available from the Carbon Dioxide Information Analysis Center (http://cdiac.esd.ornl.gov/)

How might this be related to population size and affluence?

Generally speaking, richer countries and more affluent life styles contribute more to CO_2 production, but there are notable exceptions that proove that affluent living does not automatically result in high CO_2 production:

The figure below shows the per capita production of carbon dioxide (in metric tons of carbon per inhabitant emitted per year) in 1997, for all the 31 countries that contributed more than 0.5% to the total global production of fossil CO_2. North American countries (U.S. and Canada) average about 5 tons of CO_2 carbon per person, most countries in the European Union average less than half that (around 2.2 tons per person), and some of the most highly populated countries (and thus big CO_2 producers) including the Peoples Republic of China, India, and Brazil are all below the global average of 1.13 metric tons of CO_2 carbon per person.

Two notable countries not listed in the figure below are:
The U.S. Virgin Islands as the country with the highest rate of any on the planet (33.22 metric tons of CO_2 carbon per inhabitant, corresponding to 0.05% of global fossil CO_2 production in 1997).
Switzerland as the most affluent nation on the planet (based on per capita median income and GDP values for 1997). Switzerland in 1997 produced 1.52 metric tons of CO_2 carbon per inhabitant (corresponding to 0.18% of total global production). The example of Switzerland shows that it is possible to maintain an affluent community at per capita CO_2 production rates near the global average, or about 28% of the U.S per capita CO_2 production rate.

Appendix F

Annex I

Parties in alphabetical order
Australia
Austria
Belarus
Belgium
Bulgaria
Canada
Croatia
Czech Republic
Denmark
Estonia
European Economic Community
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Japan
Latvia
Liechtenstein
Lithuania
Luxembourg
Monaco
Netherlands
New Zealand
Norway
Poland
Portugal
Romania
Russian Federation
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
Ukraine
United Kingdom of Great Britain and Northern Ireland
United States of America

Appendix G

Non Annex I

Parties in alphabetical order
Afghanistan

Albania
Algeria
Angola
Antigua and Barbuda
Argentina
Armenia
Azerbaijan
Bahamas
Bahrain
Bangladesh
Barbados
Belize
Benin
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Burkina Faso
Burundi
Cambodia
Cameroon
Cape Verde
Central African Republic
Chad
Chile
China

Colombia
Comoros
Congo
Cook Islands
Costa Rica
Côte d'Ivoire
Cuba
Cyprus
Democratic People's Republic of Korea
Democratic Republic of the Congo
Djibouti
Dominica
Dominican Republic
Ecuador
Egypt
El Salvador
Equatorial Guinea
Eritrea
Ethiopia
Fiji
Gabon
Gambia
Georgia
Ghana
Grenada
Guatemala
Guinea

Guinea Bissau	Mauritania
Guyana	Mauritius
Haiti	Mexico
Honduras	Micronesia (Federated States of)
India	Mongolia
Indonesia	Morocco
Iran (Islamic Republic of)	Mozambique
Israel	Myanmar
Jamaica	Namibia
Jordan	Nauru
Kazakhstan	Nepal
Kenya	Nicaragua
Kiribati	Niger
Kuwait	Nigeria
Kyrgyzstan	Niue
Lao People's Democratic Republic	Oman
Lebanon	Pakistan
Lesotho	Palau
Liberia	Panama
Libyan Arab Jamahiriya	Papua New Guinea
Madagascar	Paraguay
Malawi	Peru
Malaysia	Philippines
Maldives	Qatar
Mali	Republic of Korea
Malta	Republic of Moldova
Marshall Islands	Rwanda

Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Samoa
San Marino
Sao Tome and Principe
Saudi Arabia
Senegal
Serbia and Montenegro
Seychelles
Sierra Leone
Singapore
Solomon Islands
South Africa
Sri Lanka
Sudan
Suriname
Swaziland
Syrian Arab Republic
Tajikistan

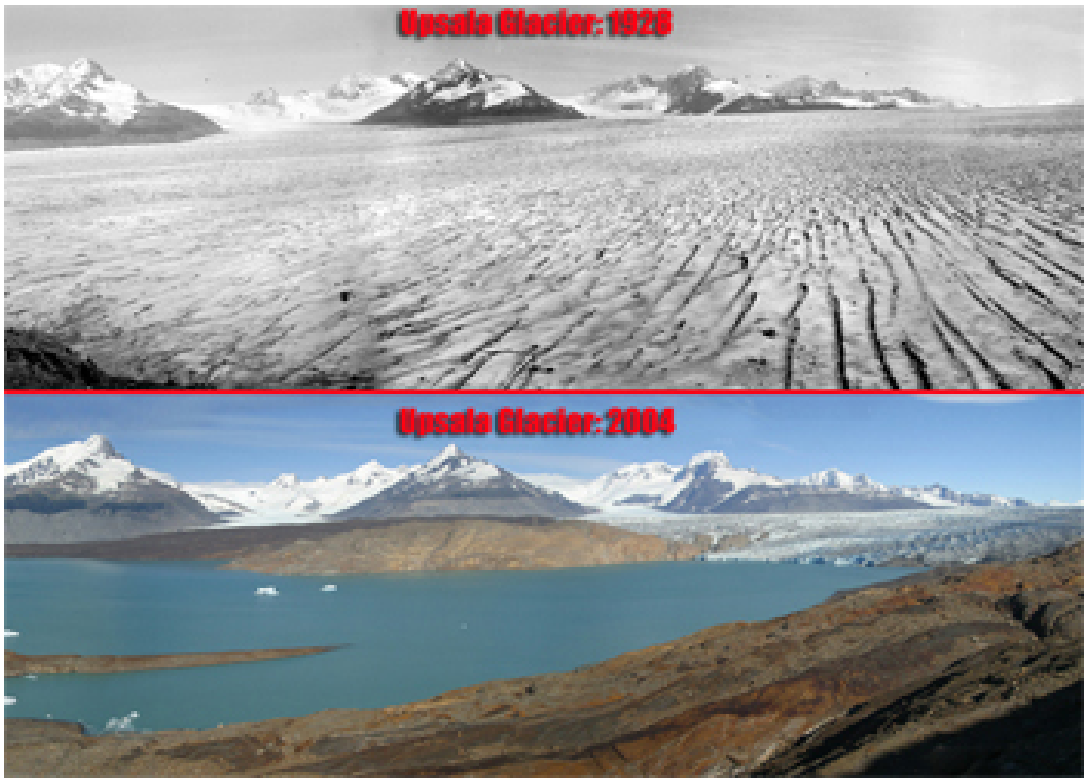
Thailand
The former Yugoslav Republic of Macedonia
Togo
Tonga
Trinidad and Tobago
Tunisia
Turkmenistan
Tuvalu
Uganda
United Arab Emirates
United Republic of Tanzania
Uruguay
Uzbekistan
Vanuatu
Venezuela
Viet Nam
Yemen
Zambia
Zimbabwe

Appendix H

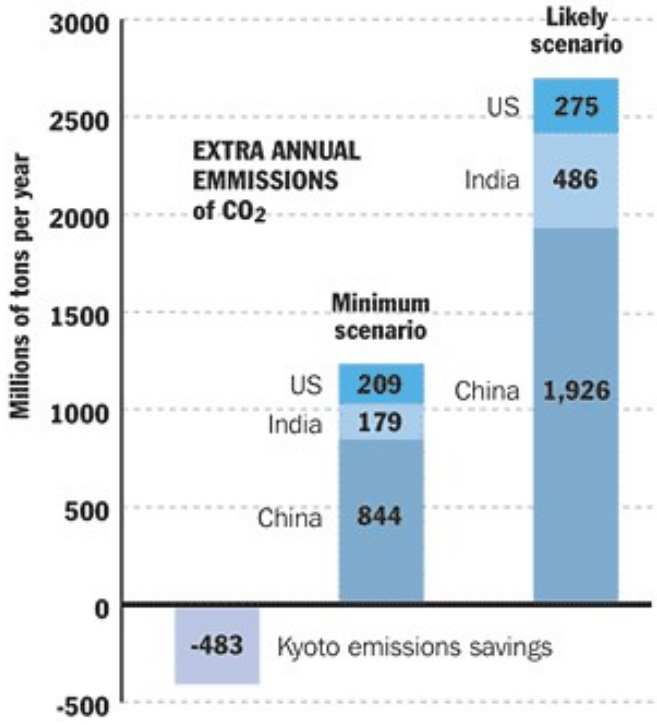
List of Least Developed Countries			
1	Afghanistan	26	Madagascar
2	Angola	27	Malawi
3	Bangladesh	28	Maldives
4	Benin	29	Mali

5	Bhutan	30	Mauritania
6	Burkina Faso	31	Mozambique
7	Burundi	32	Myanmar
8	Cambodia	33	Nepal
9	Cape Verde	34	Niger
10	Central African Republic	35	Rwanda
11	Chad	36	Samoa
12	Comoros	37	São Tomé and Principe
13	Democratic Republic of the Congo	38	Senegal
14	Djibouti	39	Sierra Leone
15	Equatorial Guinea	40	Solomon Islands
16	Eritrea	41	Somalia
17	Ethiopia	42	Sudan
18	Gambia	43	Timor-Lesté
19	Guinea	44	Togo
20	Guinea-Bissau	45	Tuvalu
21	Haiti	46	Uganda
22	Kiribati	47	United Republic of Tanzania
23	Lao People's Democratic Republic	48	Vanuatu
24	Lesotho	49	Yemen
25	Liberia	50	Zambia

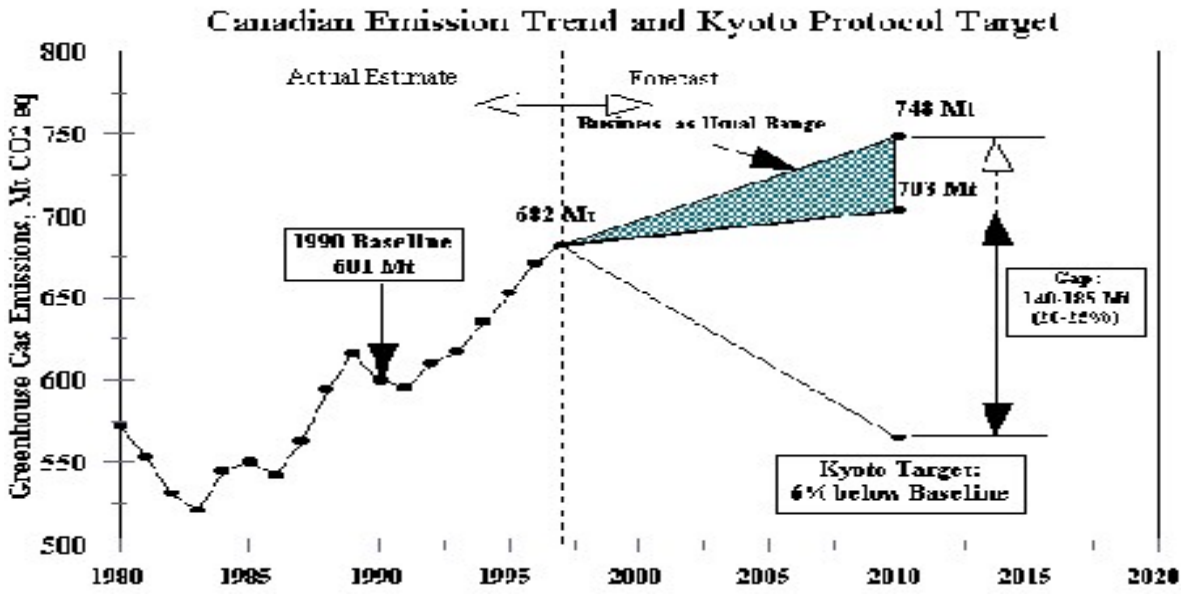
Appendix I



Appendix J



Appendix K



Appendix L

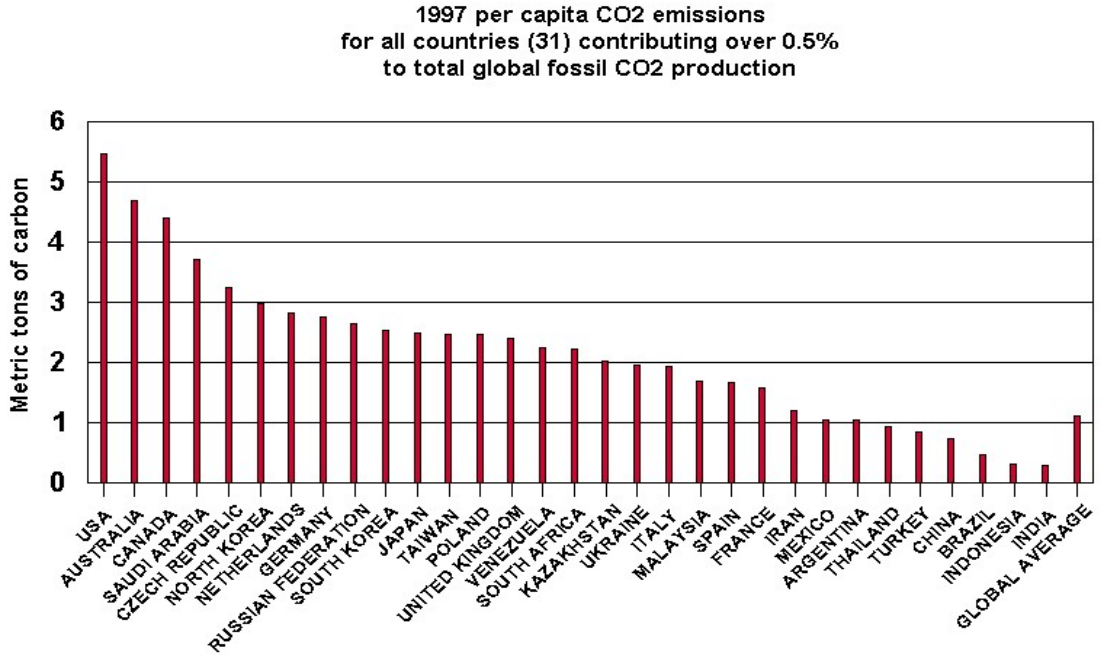


Figure by M. Horning based on Data from Gregg Marland and Tom Boden (Oak Ridge National Laboratory) and Bob Andres (University of North Dakota), available from the Carbon Dioxide Information Analysis Center (http://cdiac.esd.ornl.gov/)

ISU

The Kyoto Protocol and Global Warming

By: Matthew Biehl
For: Mr. Morrison
Due: Monday, May 16, 2005