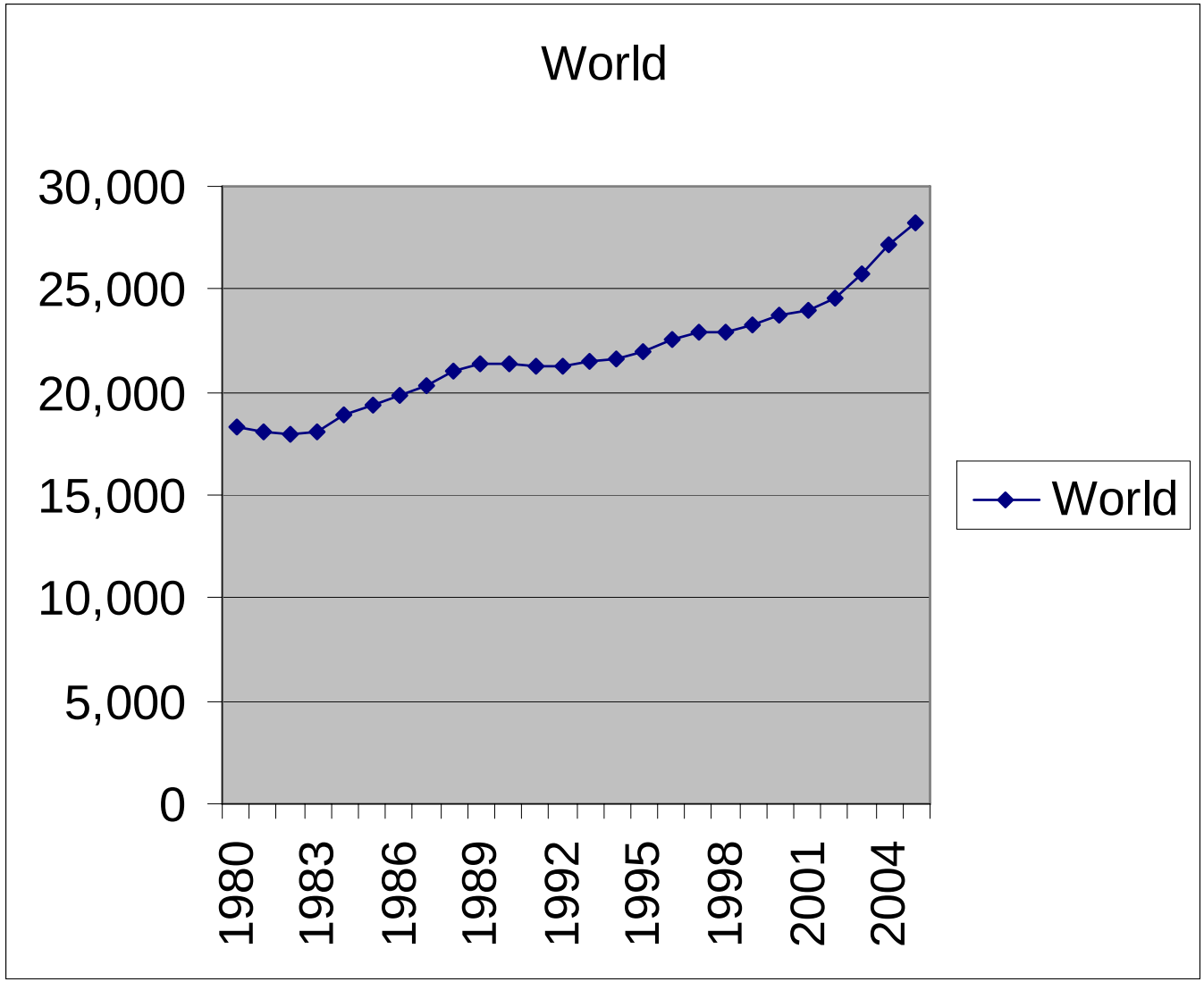
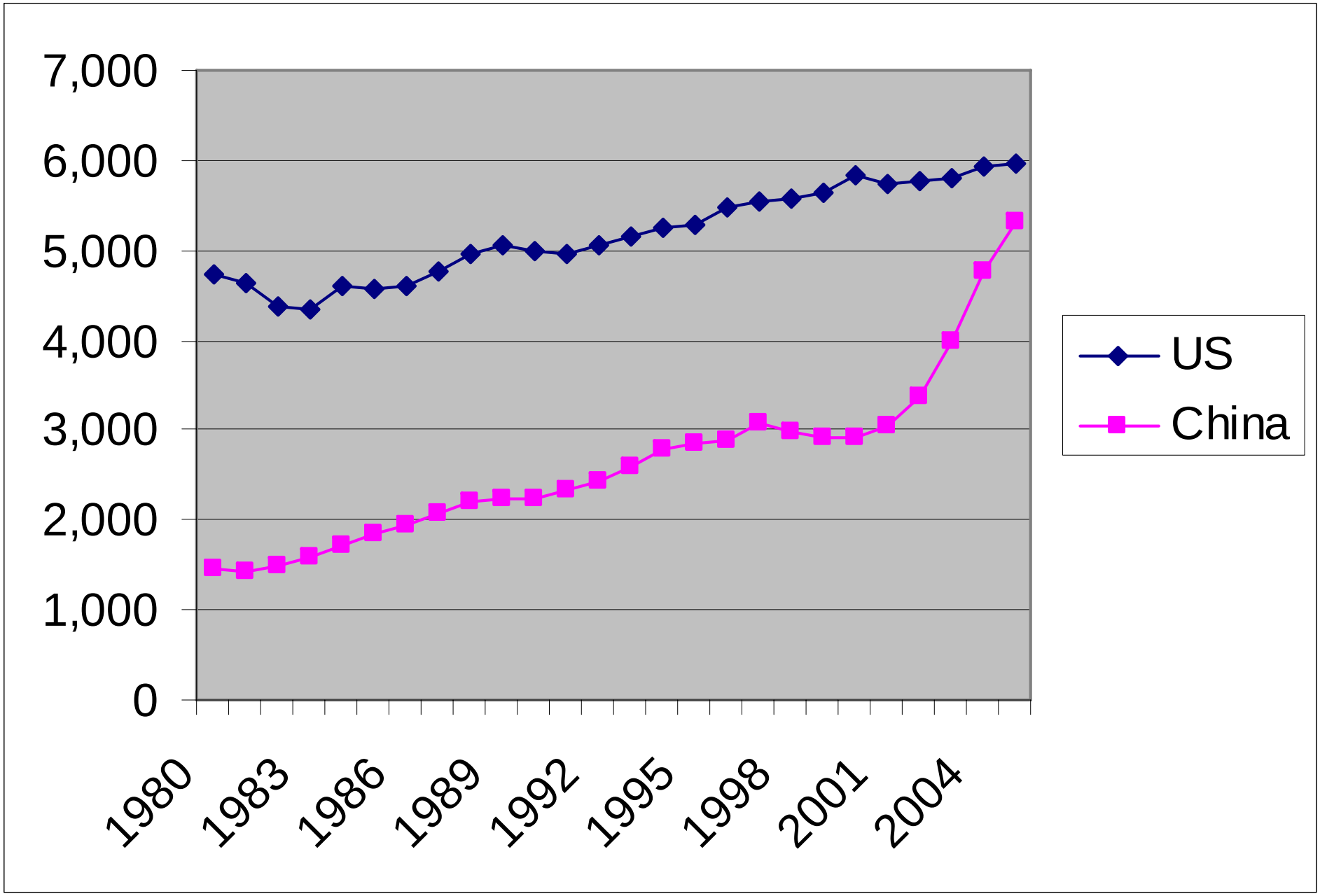
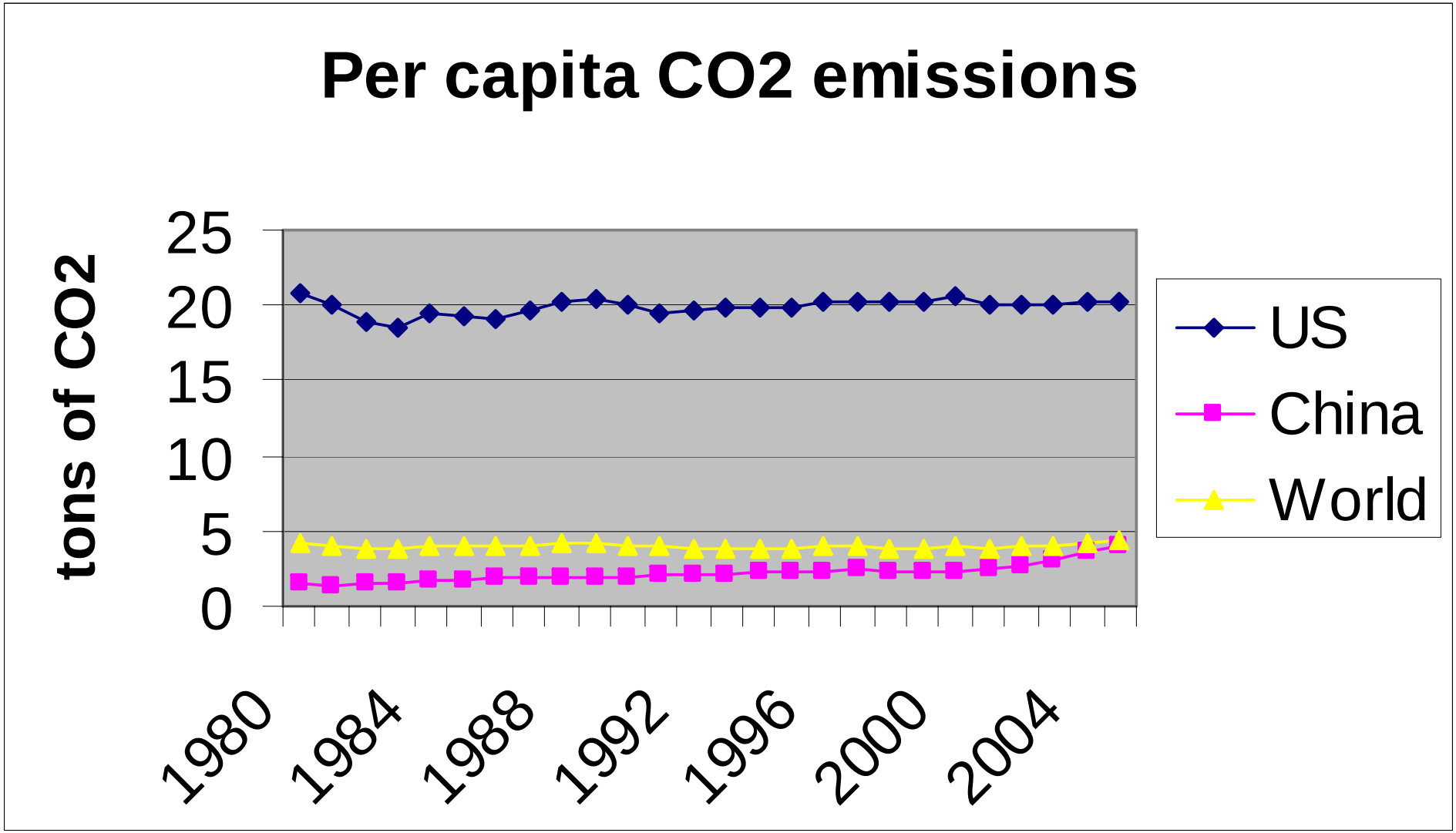
Lecture 24: Monday, April 23
Kyoto and other “top down” emissions controls

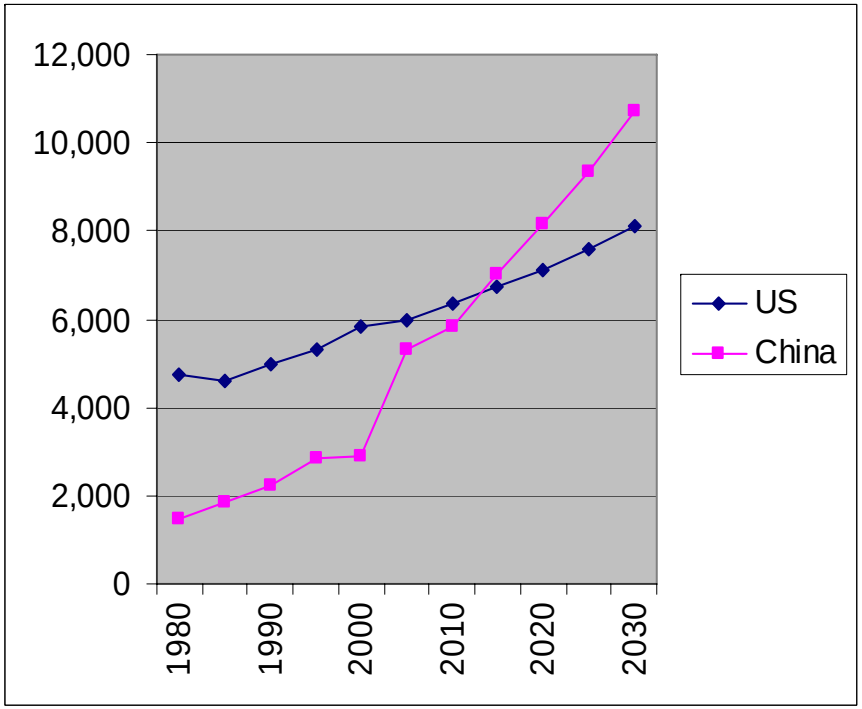
Homework #5 – due Wednesday in class

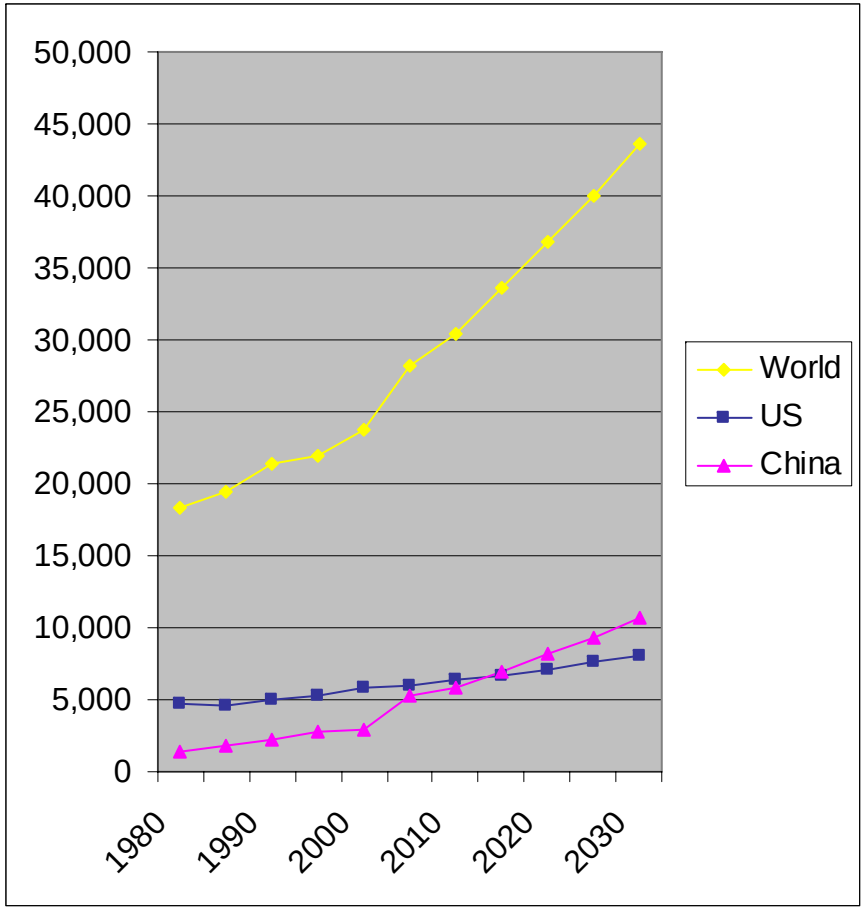
The final exam is Wednesday, May 14, from 12-2 PM in VD-211.
The format will be multiple choice, similar to the in-class hour exams.
The whole course will be covered, but material from the third section will be emphasized more heavily.


World
30,000
25,000
20,000
15,000
10,000
5,000
0
1980
1983
1986
1989
1992
1995
1998
2001
2004
World


7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1980
1983
1986
1989
1992
1995
1998
2001
2004
US
China


Per capita CO2 emissions
tons of CO2
25
20
15
10
5
0
1980
1984
1988
1992
1996
2000
2004
US
China
World


12,000
10,000
8,000
6,000
4,000
2,000
0
1980
1990
2000
2010
2020
2030
US
China


50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
1980
1990
2000
2010
2020
2030
World
US
China

The Vienna Convention and the Montreal Protocol

In 1985, scientific concerns about damage to the ozone layer prompted governments to adopt the Vienna Convention on the Protection of the Ozone Layer (Adobe PDF), which established an international legal framework for action. Then, two years later, in 1987, international negotiators met again to adopt legally binding commitments in the Montreal Protocol on Substances that Deplete the Ozone Layer, which required industrialized countries to reduce their consumption of chemicals harming the ozone layer.

During the evolution of it's implementation, as a result of changing conditions and increased information, additional requirements have been added to the Montreal Protocol through amendments adopted in London (1990), Copenhagen (1992), Montreal (1997) and Beijing (1999).

Phase-Out Targets

As of September 2002, 183 countries have ratified the Montreal Protocol which sets out the time schedule to "freeze" and reduce consumption of ozone depleting substances (ODS). The Montreal Protocol requires all Parties to ban exports and imports of controlled substances to and from non-Parties. Production and consumption of CFCs, halons and other ozone depleting chemicals have been phased out in industrialized countries and a schedule is in place to eliminate the use of methyl bromide, a pesticide and agricultural fumigant. Developing countries (Article 5 Parties) operate under different phase-out schedules, having been given a grace period before phase-out measures would apply to them, in recognition of their need for industrial development and their relatively small production and use of ODS. Developing countries have agreed to freeze most CFC consumption as of 1 July 1999 based on 1995-97 averages, to reduce this consumption by 50% by 1 January 2005 and to fully eliminate these CFCs by 1 January 2010. Other control measures apply to ODS such as halons, carbon tetrachloride and methyl chloroform. For methyl bromide, used primarily as a fumigant, developed countries froze their consumption at 1995 levels and will eliminate all use by 2010, while developing countries have committed to freeze consumption by 2002 based on average 1995-98 consumption levels.

Countries included in Annex B to the Kyoto Protocol and their emissions targets

Country	Target (1990** - 2008/2012)
EU-15*, Bulgaria, Czech Republic, Estonia, Latvia,Liechtenstein, Lithuania, Monaco, Romania,Slovakia,Slovenia, Switzerland	-8%
US***	-7%
Canada, Hungary, Japan, Poland	-6%
Croatia	-5%
New Zealand, Russian Federation, Ukraine	0
Norway	+1%
Australia	+8%
Iceland	+10%

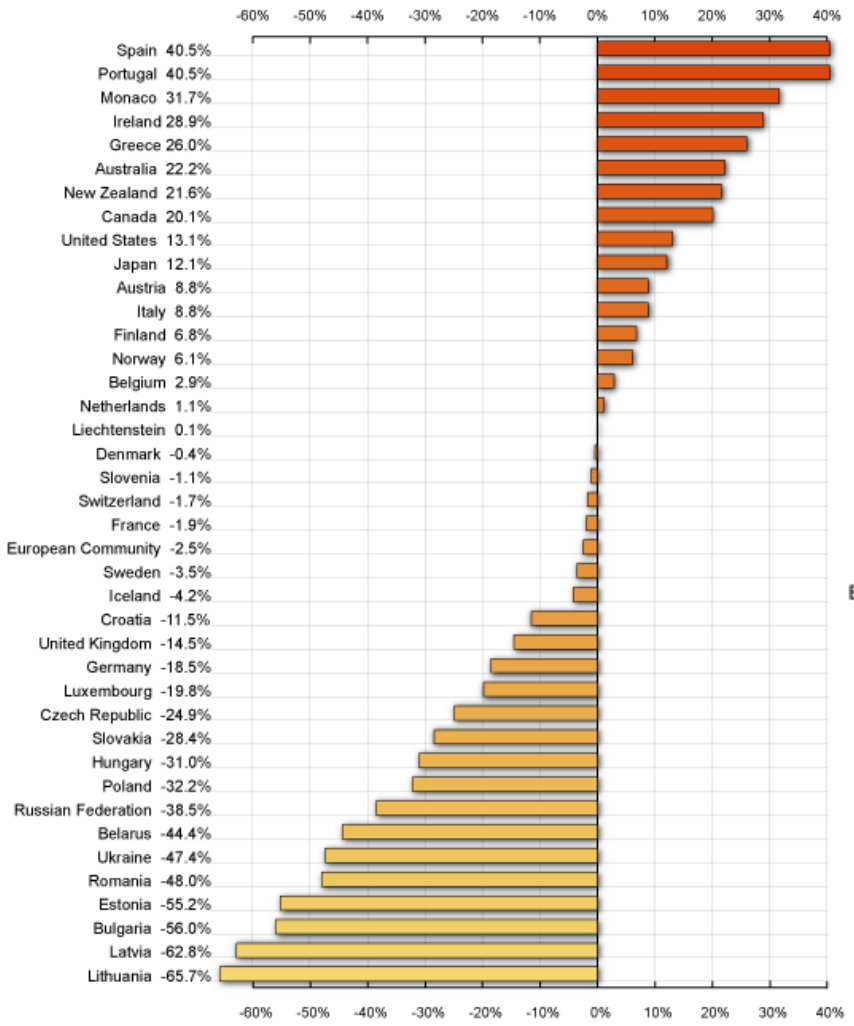
* The EU's 15 member States will redistribute their targets among themselves, taking advantage of a scheme under the Protocol known as a "bubble". The EU has already reached agreement on how its targets will be redistributed.

** Some EITs have a baseline other than 1990.

*** The US has indicated its intention not to ratify the Kyoto Protocol.

Note: Although they are listed in the Convention's Annex I, *Belarus* and *Turkey* are not included in the Protocol's Annex B as they were not Parties to the Convention when the Protocol was adopted.

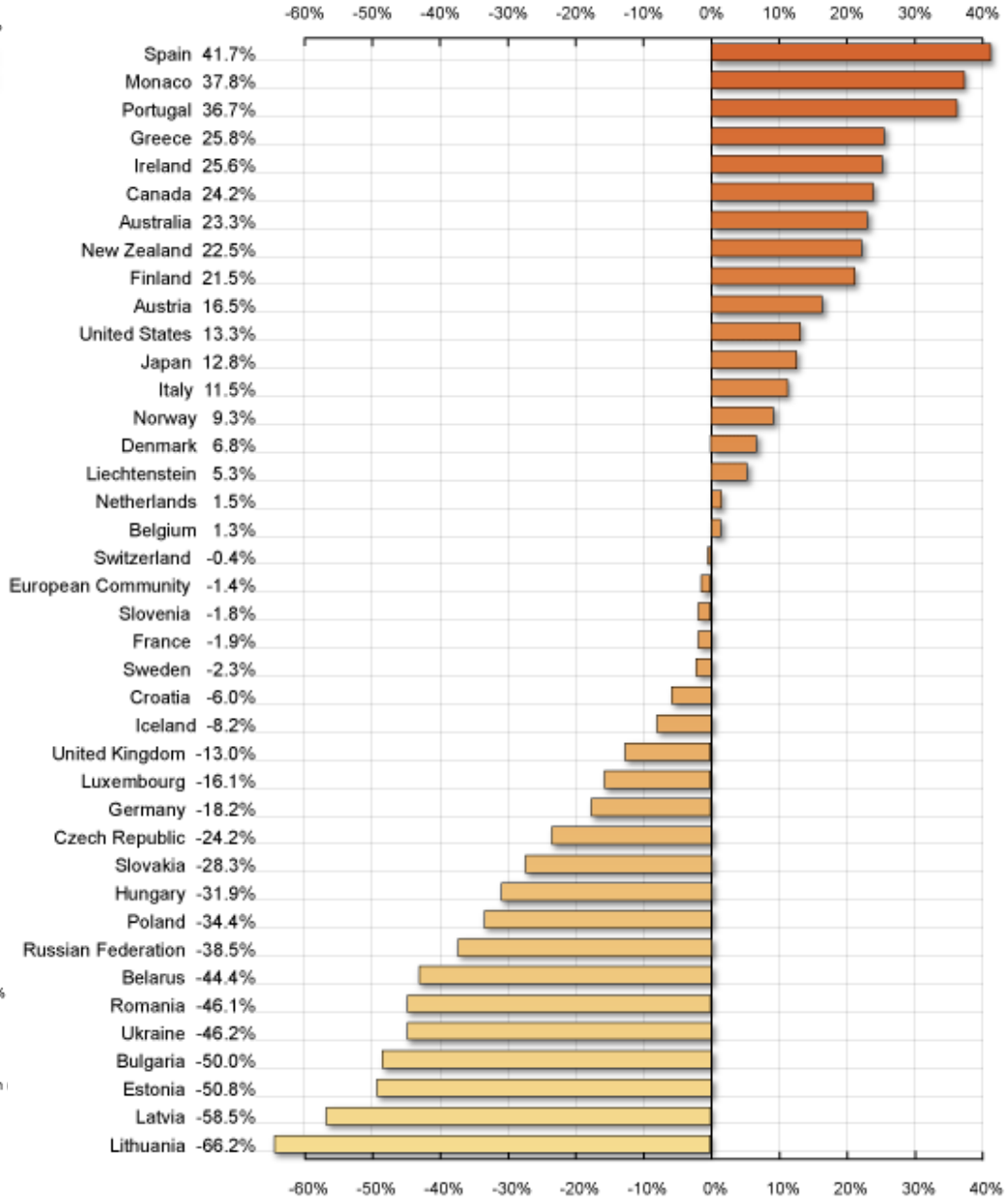
Total aggregate greenhouse gas emissions of individual Annex I Parties, 1990-2002



Change relative to 1990 in percentage (%)

* The change related to 1990 shown here is for 2002 except for Liechtenstein (1990), Poland (2001) and Russian Federation

Total aggregate greenhouse gas emissions of individual Annex I Parties, 1990-2003*



Change relative to 1990 in percentage (%)

* The change related to 1990 shown here is for 2002 except for Liechtenstein (1990), Poland (2001) and Russian Federation (1999)

How does emissions trading benefit companies and the environment?

Companies A and B both emit 100 000 tonnes of CO_2 per year. In their national allocation plans their governments give each of them emission allowances for 95 000 tonnes, leaving them to find ways to cover the shortfall of 5 000 allowances. This gives them a choice between reducing their emissions by 5 000 tonnes, purchasing 5 000 allowances in the market or taking a position somewhere in between. Before deciding which option to pursue they compare the costs of each.

In the market, the price of an allowance at that moment is EUR 10 per tonne of CO_2. Company A calculates that cutting its emissions will cost it EUR 5 per tonne, so it decides to do this because it is cheaper than buying the necessary allowances. Company A even decides to take the opportunity to reduce its emissions not by 5 000 tonnes but by 10 000.

Company B is in a different situation. Its reduction costs are EUR 15 per tonne, i.e. higher than the market price, so it decides to buy allowances instead of reducing emissions.

Company A spends EUR 50 000 on cutting its emissions by 10 000 tonnes at a cost of EUR 5 per tonne, but then receives EUR 50 000 from selling the 5 000 allowances it no longer needs at the market price of EUR 10 each. This means it fully offsets its emission reduction costs by selling allowances, whereas without the emissions trading system it would have had a net cost of EUR 25 000 to bear (assuming that it cut emissions by only the 5 000 tonnes necessary).

Company B spends EUR 50 000 on buying 5 000 allowances at a price of EUR 10 each. In the absence of the flexibility provided by the ETS, it would have had to cut its emissions by 5 000 tonnes at a cost of EUR 75 000.

Emissions trading thus brings a total cost-saving of EUR 50 000 for the companies in this example. Since Company A chooses to cut its emissions (because this is the cheaper option in its case), the allowances that Company B buys represent a real emissions reduction even if Company B did not reduce its own emissions.

December 21, 2006

Outsize Profits, and Questions, In Effort to Cut Warming Gases

By KEITH BRADSHER

Foreign businesses have embraced an obscure United Nations-backed program as a favored approach to limiting global warming. But the early efforts have revealed some hidden problems.

Under the program, businesses in wealthier nations of Europe and in Japan help pay to reduce pollution in poorer ones as a way of staying within government limits for emitting climate-changing gases like carbon dioxide, as part of the Kyoto Protocol.

Among their targets is a large rusting chemical factory here in southeastern China. Its emissions of just one waste gas contribute as much to global warming each year as the emissions from a million American cars, each driven 12,000 miles.

Cleaning up this factory will require an incinerator that costs $5 million -- far less than the cost of cleaning up so many cars, or other sources of pollution in Europe and Japan.

Yet the foreign companies will pay roughly $500 million for the incinerator -- 100 times what it cost. The high price is set in a European-based market in carbon dioxide emissions. Because the waste gas has a far more powerful effect on global warming than carbon dioxide emissions, the foreign businesses must pay a premium far beyond the cost of the actual cleanup.

The huge profits from that will be divided by the chemical factory's owners, a Chinese government energy fund, and the consultants and bankers who put together the deal from a mansion in the wealthy Mayfair district of London.

Arrangements like this still make sense to the foreign companies financing them because they are a lot less expensive, despite the large profit for others, than cleaning up their own operations.

China Releases Climate Change Plan

On June 4, 2007, China released its first national climate change plan. Prepared by China's National Development and Reform Commission, the plan outlines China's strategy for addressing climate change through national programs aimed at mitigation, adaptation, science and technology research, and increasing public awareness.

Statement: China's Climate Action Program

Statement by Eileen Claussen, President, Pew Center on Global Climate Change

June 4, 2007

With its new national climate change strategy, and the establishment of a new National Leading Group headed by Premier Wen Jiabao, the Chinese leadership is signaling that it recognizes the critical importance of this issue to China and to other nations. The new strategy underscores the severe environmental and economic risks China faces in a warming world and outlines a broad array of government policies that are helping to moderate the growth of China's greenhouse gas emissions. These include ambitious energy efficiency and renewable energy goals and programs that reduce emissions from industry, agriculture, and forestry. Without these policies, China's emissions would be far higher than they are today.

However, much stronger action is needed to slow, stop, and reverse China's rapid emissions growth. When the United States caps its own greenhouse gas emissions, it will have begun to fulfill the commitment it made with other developed countries to lead the climate effort. It will then be reasonable to expect that China and other major emerging economies fulfill their responsibilities as well.

Our aim must be a new set of multilateral commitments ensuring that each of the major economies contributes its fair share to the global climate effort. The post-2012 framework should be flexible so that countries can take on different types of commitments. For developing countries, rather than economy-wide emissions targets, these could be "policy commitments" - China, for instance, could initially commit to strengthen its existing efficiency and renewables policies. But all commitments must be credible, binding, and closely monitored. Only through a balanced set of commitments and incentives can we hope to mobilize the efforts needed to dramatically reduce emissions in China and around the world.