

United States versus European Union: Cap-and-Trade Systems aimed at Combating Global Climate Change



Presentation by
Mark McInerney and Caroline Kreadle

Overview of Cap and Trade Systems

- Cap and Trade, or marketable pollution permits, has become the most widely accepted solution in the environmental economics community to the problem of global pollution.
- The cap and trade model is based on the distribution of permits which allow emissions of various pollutions; the amount of emissions is determined by a central authority and these permits can then be traded on a secondary market.
- The model is based on the assumption that firms have an upward sloping Marginal Cost of Abatement curve (Marginal Cost of pollution reduction) that ends at 100% emissions reduction. The cap and trade policy reduces total emissions in the systems and then firms react and reduce emissions based on their various Marginal Cost of abatement curves.
- Firms will abate up to the point at which the marginal cost of abatement equals the cost of the permit; at this point, the firm will choose to purchase permits rather than pay the increasing marginal cost of abatement.

Theoretical Results of Policy

- Cap and Trade can slowly reduce emissions by giving firms, and possibly consumers, incentive to reduce emissions.
 - Caps can be adjusted based on the selected trading period to sequentially lower emissions.
- Cap and trade can be beneficial to firms with low cost of abatement because they can sell excess permits.
 - Firms with high cost of abatement typically buy more permits on the market.
- Permits can be auctioned or allocated for free.
 - If auctioned, revenue from permits may go towards consumer subsidies, firm subsidies or investment in clean technology .
- Cap and Trade will not be an effective system if allocations of emissions permits are not reduced from period to period.
- Cap and Trade should encourage long term investment in cleaner technologies and innovation, as well as sustainable growth.

A Cap and Trade System Should Include:

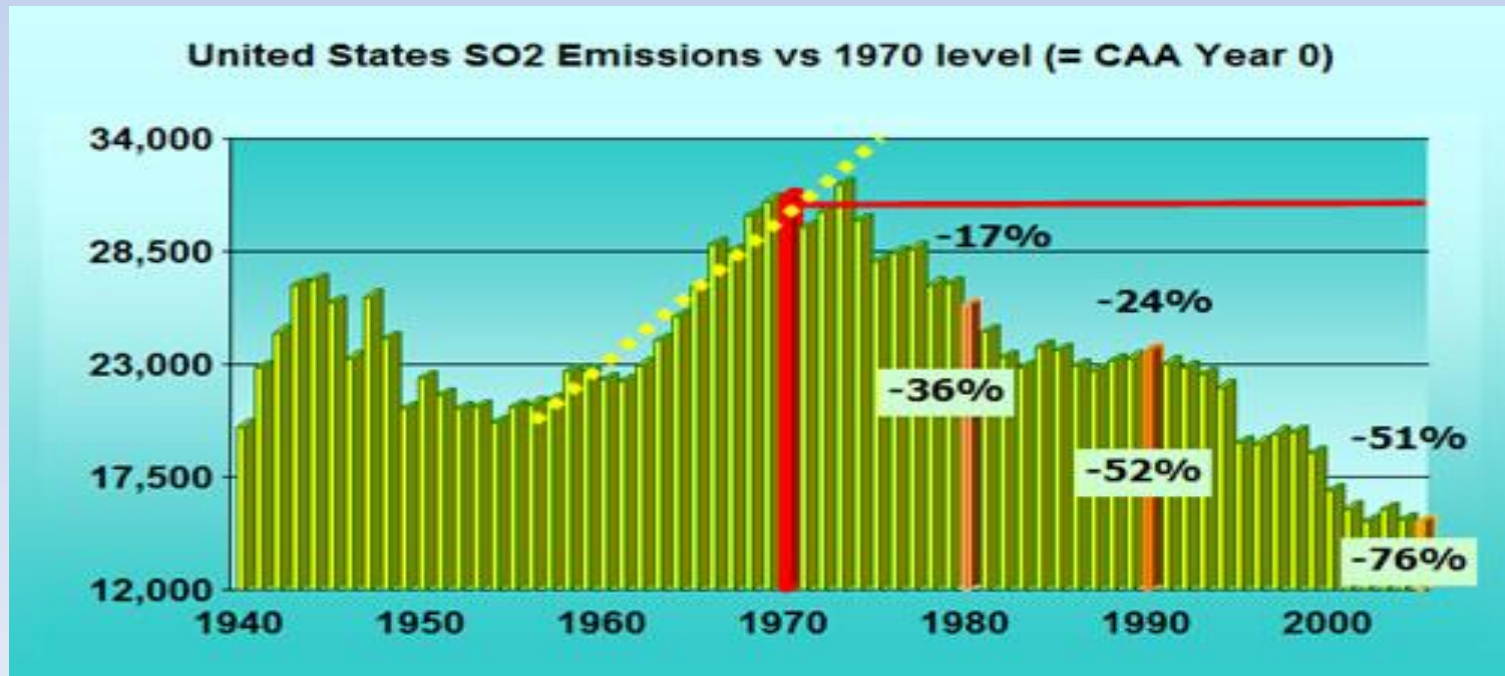
- Scope: which emissions should be capped?
- Point of Regulation: which sectors, who will be required to hold permits (firms or people)?
- Allocations: free allocation vs. auction. Tradable or non-tradable permits? Can unused permits roll over to different cap periods?
- Offsets: can companies avoid reducing emissions by participating in other environmentally friendly programs or activities?
- Revenue Use: if permits are auctioned, where should the revenues of the auction go?

Upstream, Midstream or Downstream?

- Cap and Trade can focus on either Upstream, Midstream or Downstream pollution creation.
 - Upstream: where potential pollution (fossil fuels) first enters the economy
 - Midstream: where retailers or other fossil fuel handlers enter
 - Downstream: where consumers purchase fossil fuels
- Upstream is probably the most efficient focus for Cap and Trade.
- “By implementing cap and trade ‘upstream’ before the fuel fans out through the distribution system, we can run a cap-and-trade system without any required actions for more than 99.9 percent of companies (and for 100 percent of families). Fossil fuels enter our economy through a handful of choke points.” – Alan During

Where Cap and Trade is Used

- **United States SO₂ Program (Acid Rain Program)**
 - Part of the 1990 amendment to the Clean Air Act
 - The Economist called the Acid Rain Program: "probably the greatest green success story of the past decade."
 - In 2000, 76% reduction in SO₂ levels from 1970 levels.
 - The costs has been far less than the EPA originally estimated (20%-30% of original estimates).

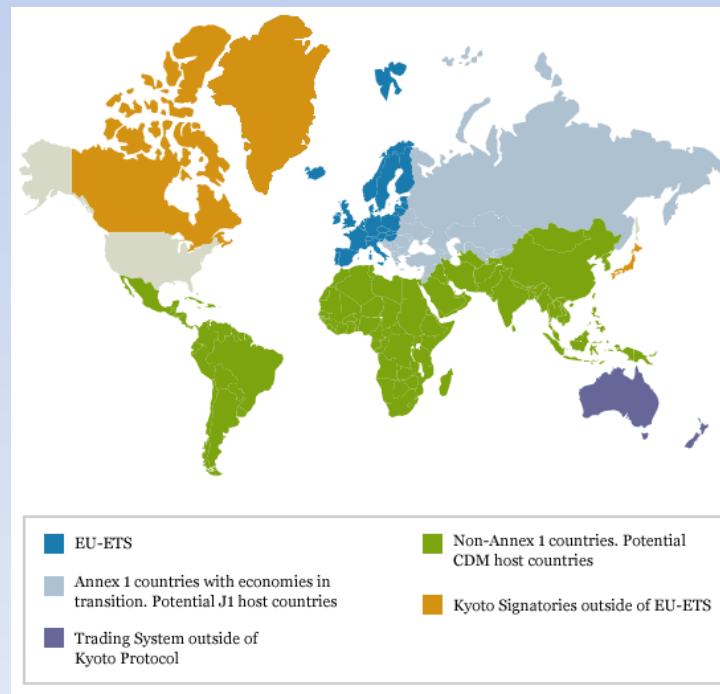


Kyoto Protocol

Perhaps the most widely-known international policy aimed at combating global climate change, the Kyoto Protocol was initially adopted on December 11, 1997 as is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC).

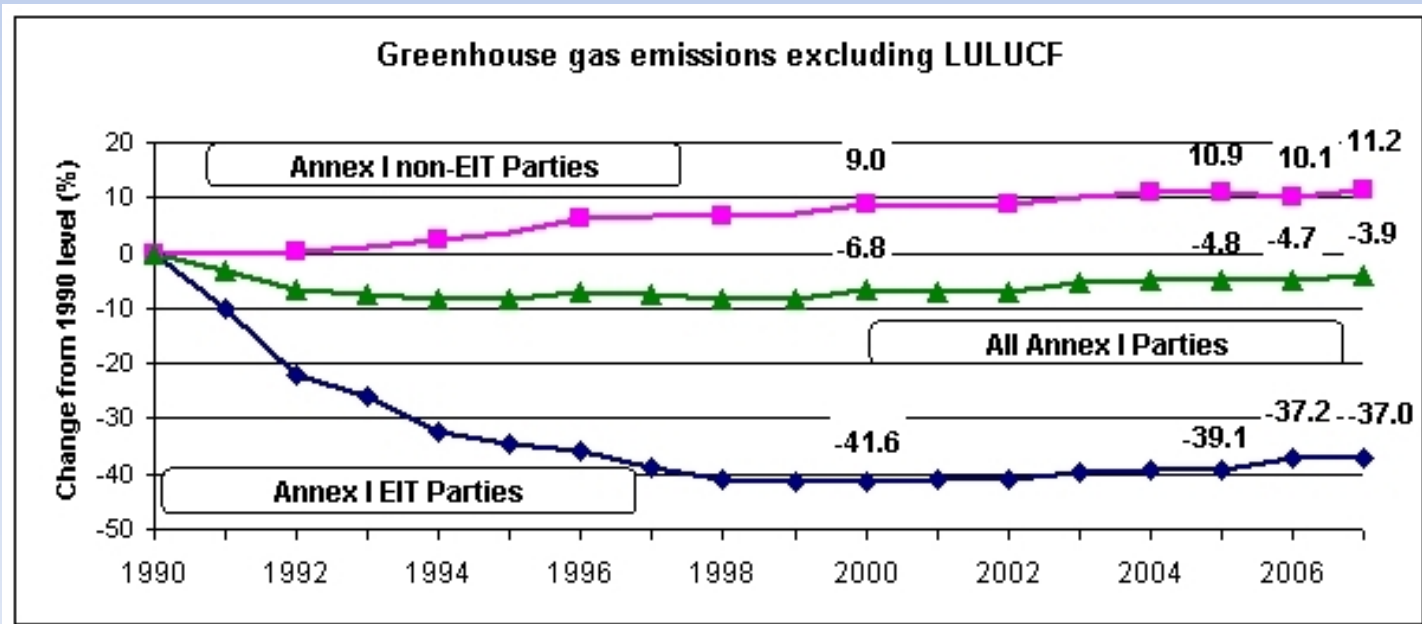
Participation:

- As of November 2009, 187 states have signed and ratified the protocol; the United States is not among them.
- The most active participants are the Annex I countries, which include 39 industrialized countries and the European Union. Between 2008-2012, they have agreed to reduce their collective greenhouse gas emissions by an average of 5% compared to 1990 levels.



Compliance:

- Parties to the Convention submit national greenhouse gas (GHG) inventories to the Climate Change secretariat.
- The Protocol allows for several “flexible mechanisms”, such as emissions trading, the clean development mechanism (CDM) and joint implementation to allow Annex I countries to meet their GHG emission limitations. We will focus on the emissions trading mechanism, in which parties can purchase and trade GHG emission reductions credits.
- The dominant cap-and-trade system used to meet the goals set forth in the Kyoto Protocol is the international emissions trading mechanism of the European Union: The European Union Emissions Trading System (EU ETS).

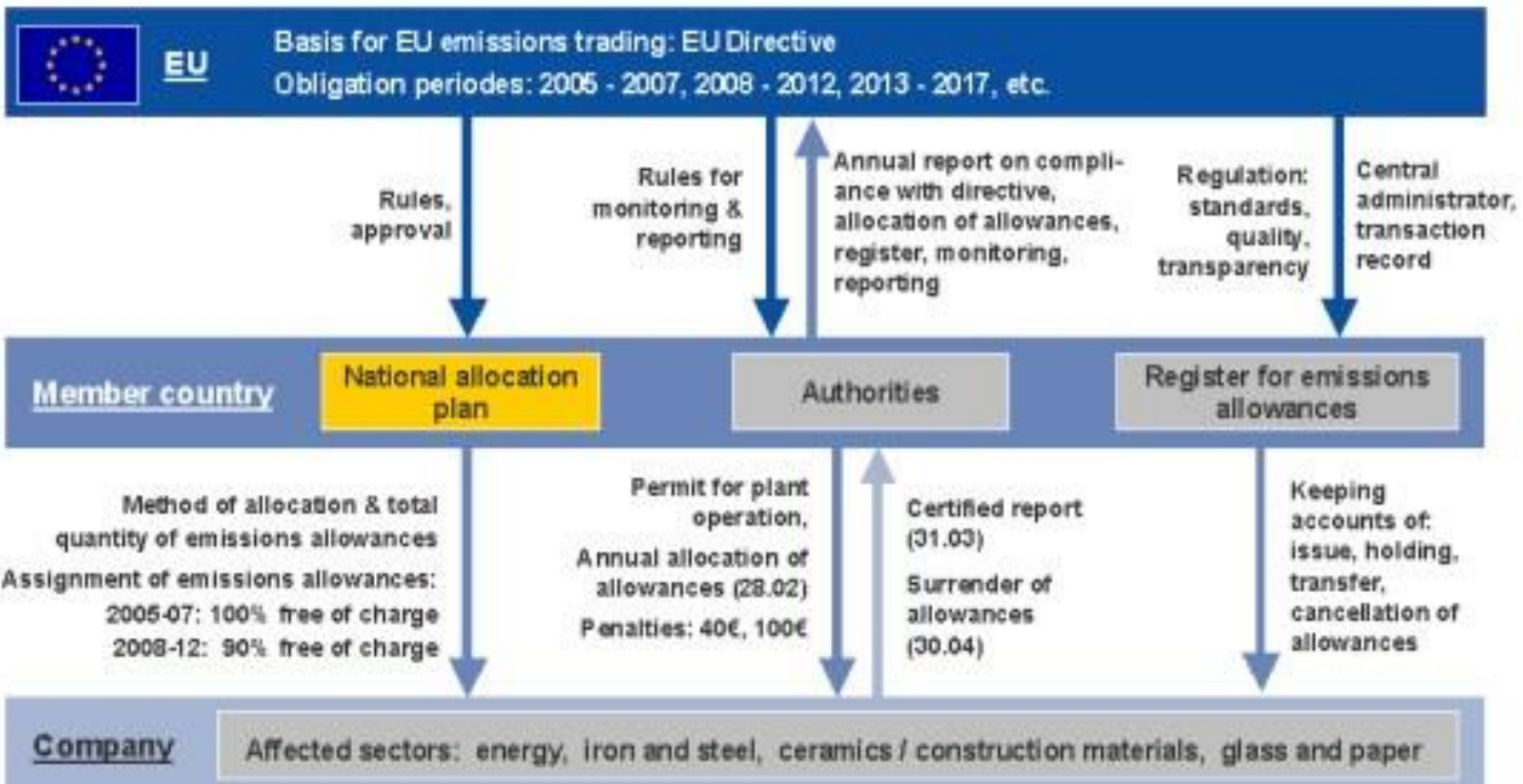


European Union Emissions Trading Scheme (EU ETS)

- The largest multi-national cap and trade system
- Trading started in January 2005
- Covers half of EU CO₂ emissions
- Covers 40% of EU greenhouse gas emissions
- For the most part, free allocation of emissions permits
- Phase 1: Jan 2005 – Dec 2007
- Phase 2: Jan 2008 – Dec 2012
- The current plan to reduce emissions by 21% by the year 2020 (from 2005 levels)

EU ETS (Continued)

General objective:	Meeting international emissions reduction targets >> -8% CO ₂ by 2012
Measures:	Obligation of energy-intensive sectors to reduce emissions



United States' Cap-and-Trade Policies aimed at Combating Global Climate Change



Regional Greenhouse Gas Initiative (RGGI): first mandatory, market-based CO₂ emissions reduction program in the US

Ten Participating States: CT, DE, MA, MD, ME, NH, NJ, NY, RI, VT

Coverage: Fossil fuel-fired power plants (25 megawatts or greater capacity; currently covers 209 facilities).

Initial CO₂ Emissions Cap: 188 million short tons per year for the 10-state region

Timing of CO₂ Reductions: 2009-2014: cap stabilizes emissions at 188 million tons annually; 2015-2018: cap declines by 2.5% per year for total reduction of 10%.

CO₂ Allowance Auctions: Regional, “single-round,” “sealed-bid,” “uniform-price”; held quarterly, open to all who qualify (permits can be traded within and among states).

Compliance Period: Three years, first compliance period January 1, 2009 – December 31, 2011.

CO₂ Emission Offsets: Qualifying GHG reduction projects outside the electricity sector. Power plants may use offsets to meet 3.3% of their compliance obligation (limit on use increases to 5–10% of compliance obligation under specified conditions) .

Auction Proceeds: Overall, 80% invested in consumer benefit programs, including energy efficiency, renewable energy, direct energy bill assistance and other greenhouse gas reduction program.

Regional Annual CO2 Emissions Budget (short tons)

2009-2014:	188,076,976
2015:	183,375,052
2016:	178,673,127
2017:	173,971,203
2018:	169,269,278

Auctions To Date

Auction #	Control Period	Quantity Offered	Quantity Sold	Clearing Price	Total Proceeds
<u>1</u> 9/25/08	Current	12,565,387	12,565,387	\$3.07	\$38,575,738.09
<u>2</u> 12/17/08	Current	31,505,898	31,505,898	\$3.38	\$106,489,935.24
<u>3</u> 3/18/09	Current Future	31,513,765 2,175,513	31,513,765 2,175,513	\$3.51 \$3.05	\$117,248,629.80
<u>4</u> 6/17/09	Current Future	30,887,620 2,172,540	30,887,620 2,172,540	\$3.23 \$2.06	\$104,242,445.00

Auction #	Control Period	Quantity Offered	Quantity Sold	Clearing Price	Total Proceeds
<u>5</u> 9/9/09	Current Future	28,408,945 2,172,540	28,408,945 2,172,540	\$2.19 \$1.87	\$66,278,239.35
<u>6</u> 12/2/09	Current Future	28,591,698 2,172,540	28,591,698 2,172,540	\$2.05 \$1.86	\$61,587,120.90
<u>7</u> 3/10/10	Current Future	40,612,408 2,137,992	40,612,408 2,137,992	\$2.07 \$1.86	\$87,956,944.56
<u>8</u> 6/09/10	Current Future	40,685,585 2,137,993	40,685,585 2,137,993	\$1.88 \$1.86	\$80,465,566.78
<u>9</u> 9/10010	Current Future	45,595,968 2,137,992	45,595,968 2,137,992	\$1.86 \$1.86	\$66,437,340.00

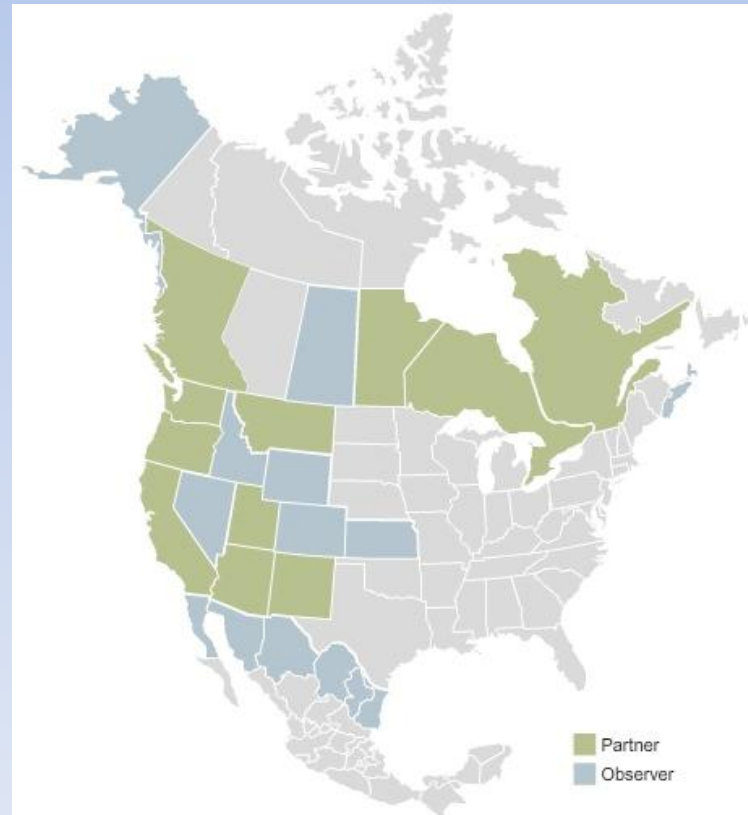
Current Status of RGGI:

- Obama administration would like to replicate system at the national level.
- Proceeds from all the RGGI auctions currently total \$729.2 million. Approximately 80% of proceeds have been invested in a variety of consumer benefit programs, including programs to improve energy efficiency, to accelerate the deployment of renewable energy technologies, and to provide energy bill payment assistance to low-income ratepayers.
- GHG emissions reductions have been accomplished.

Western Climate Initiative: second planned US greenhouse gas cap-and-trade system

Overview:

The WCI has achieved consensus on a regional strategy to reduce greenhouse gas emissions that accommodates the diversity of its 11 Partner jurisdictions, which comprise 19% of the total U.S. population and 79% of the total Canadian population. When fully implemented, the plan will cover 90 percent of GHG emissions in the region and will reduce those emissions to 15% below 2005 levels by 2020.



The WCI has collaborated with RGGI and seeks to model off of and learn from it.

The regional plan includes:

1. Carbon emissions limits
2. Offset credits
3. Complementary policies

Benefits Already Seen:

The seven state jurisdictions comprise 20% of the U.S. economy but garnered 60% of venture capital investments directed toward clean technology businesses from 2006 to 2008. In 2007, the proportion of green businesses and green jobs in the economies of the WCI state jurisdictions was 20% higher than in the U.S. economy as a whole.

The United States: Environmental Policy

- In December 2009, the Environmental Protection Agency issued the Endangerment Finding stating that a study conducted by the EPA: “...finds that the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) — in the atmosphere threaten the public health and welfare of current and future generations.”
- This Endangerment Finding means that the EPA has a responsibility to monitor and regulate emissions.

Implications of the ‘Endangerment Finding’

- The ‘Endangerment Finding’ put pressure on Congress to act on climate change.
- Both the Obama Administration and Lisa Jackson (EPA Administrator) have stated that it is preferable to have Congress set limits on Greenhouse Gas emissions rather than the EPA.
- The National Wildlife Federation called the ‘Endangerment Finding’: "single largest step the Federal Government had taken to fight climate change."
- Along with the Endangerment Finding, the EPA also released the Cause or Contribute Finding: “The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.”

Congressional Action Towards Climate Change

- Waxman-Markey Climate Bill or the “American Clean Energy and Security Act of 2009”
- The bill attempted to create clean energy jobs, save consumer energy costs, increase America’s energy independence and reduce global warming pollution.
- The bill featured:
 - A Cap and Trade System for the United States
 - Would reduce emissions 17% below 2005 levels by 2020
 - Would reduce emissions 83% below 2005 levels by 2050
 - Many opportunities for offsets
 - Strong provisions for developing clean energy and for improving efficiency
 - Strong incentives for creating green jobs
- Passed the U.S. House of Representatives in 2009 (219 Aye – 212 Nay)

Kerry-Lieberman Climate Bill

- The most recent U.S. attempt to enact Cap and Trade was the Kerry-Lieberman climate bill sponsored by John Kerry (D-MA) and Joe Lieberman (I-CT).
- This was the Senate version of the Waxman-Markey climate bill.
- Appeared to have a good chance to pass the Senate after the Waxman-Markey bill passed the house.
- The most important aspect of the Kerry-Lieberman bill was the Cap and Trade framework:
 - The cap would set emissions 4.75% below 2005 levels by 2013
 - 17% below 2005 levels by 2020
 - 42% below 2005 levels by 2030
 - 83% below 2005 levels by 2050

Kerry-Lieberman Climate Bill: Basic Framework

- The cap would include the electricity and transportation sectors by 2013 and the industrial sector by 2016.
- Transportation fuels (refined petroleum products) would be capped, yet permits for production of transportation fuels would be sold at a fixed price (determined by and auction/no free allocation) and could not be traded.
- Carbon emissions permits would be auctioned off quarterly and would be free to trade.
- Firms would have up to 2 years to acquire permits for previous emissions as an attempt to try and stabilize permit pricing.

Kerry-Lieberman Climate Bill (continued)

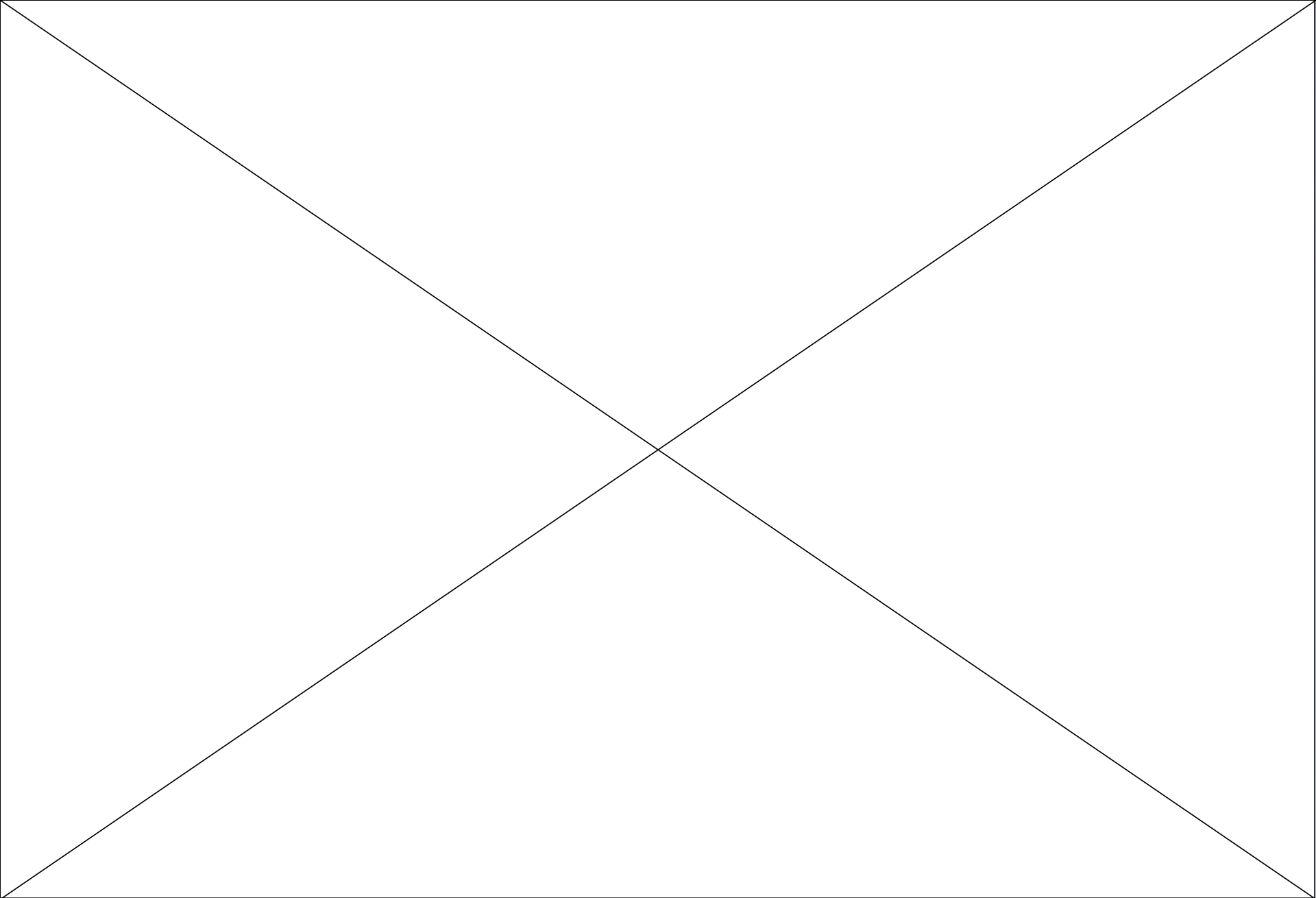
- The bill would feature a price floor and business friendly price ceiling for carbon emissions.
 - Price Floor: \$12 per ton of CO₂ (+3% annually, inflation adjusted)
 - Price Ceiling: \$25 per ton of CO₂ (+5% annually, inflation adjusted)
- The program would be administered by the EPA.
- About 60% of revenue from carbon permit sale would be indirectly returned to consumers (through local energy companies).
- Many opportunities to offset emissions for polluters.
- The bill would suspend any and all other regional Cap and Trade Programs (WCI, any state programs).
- Many subsidies and business giveaways.

Outcome of Kerry-Lieberman Climate Bill

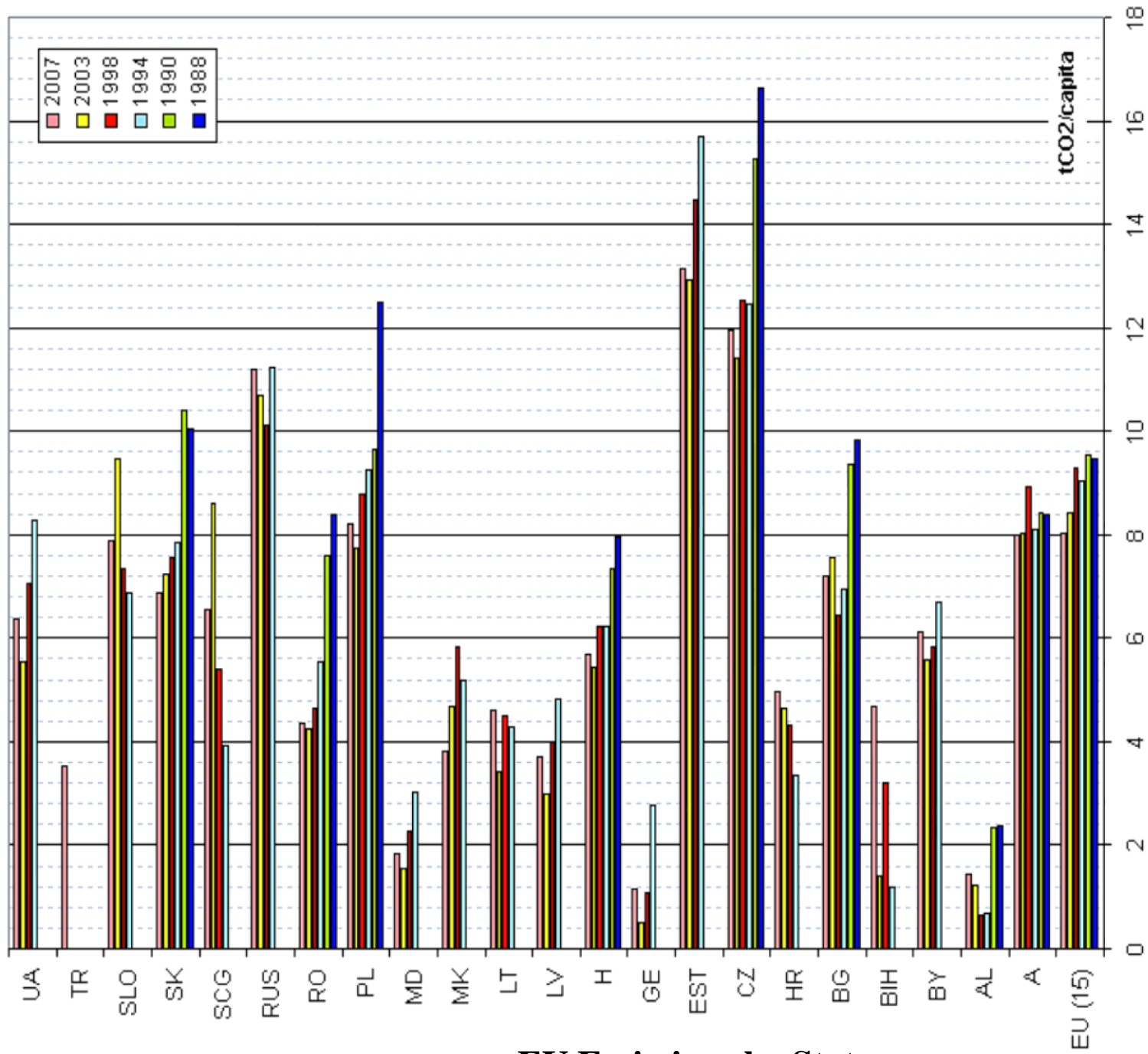
- At first, the Kerry-Lieberman Climate Bill seemed to have a great chance of success.
- It had the support of most Democrats and initially had the support of one Republican Senator Lindsay Graham (the bill needed 60 of 100 votes to get past a Senate filibuster).
- Senator Graham wanted to offer up his support in part to gain support for Immigration Reform.
- In April 2010, Senator Graham withdrew his support for the Climate Bill after being criticized for working with Democrats as he was unable to find another Republican co-sponsor in the Senate.
- The bill has been off the docket ever since.
- Republican Senate Minority leader Mitch McConnell declared the bill dead on August 24th 2010.
- The 2010 Mid-term U.S. elections make a climate bill less likely as Republicans gained a majority in Congress and reduced the Democratic majority in the Senate.

Politics of U.S. cap and trade

- Criticism of a potential Cap and Trade system in the United States is usually based on the economic impact of such a system.
- Critics state the Cap and Trade would:
 - Decrease GDP
 - Increase Energy Prices
 - Decrease jobs in coal, oil, natural gas...industries
- **Further criticism based on Global Warming as a hoax.**
- Criticism comes in large part from regions of the country with large sectors of their local economy are based on energy.
- West Virginia Governor Joe Manchin (now Senator) said that the Kerry-Lieberman Climate Bill would cost West Virginia 10,000 jobs by 2020 and would shrink its gross domestic product by \$750 million in the same period.
- Republican Senate Minority leader Mitch McConnell dismissed Cap and Trade as simply a “national energy tax”.
- Problems: lack of information for U.S. public and false political spin
 - May 2009 Rasmussen Poll showed: just 24% of Americans understood what Cap and Trade was
 - July 2010 Institute for Energy Research poll showed: 70% of Americans do not want a Cap and Trade bill to pass (Cap and Trade was referred to as a “new energy tax”)

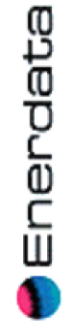


- <http://www.youtube.com/watch?v=xIJORBRpOPM>



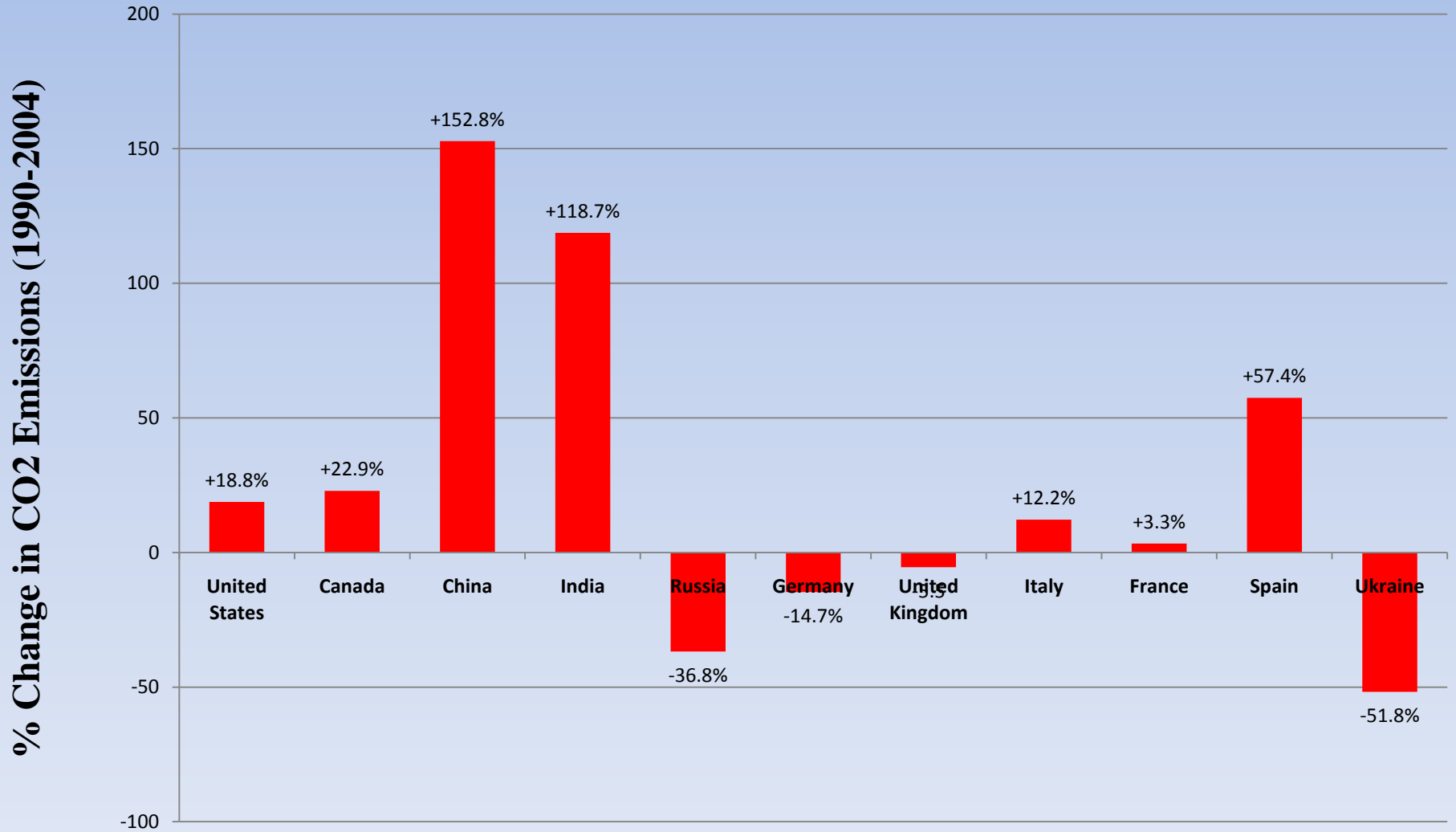
EU Emissions by State

enerCEE.net Source: Enerdata s.a. - WORLD ENERGY DATABASE 2009

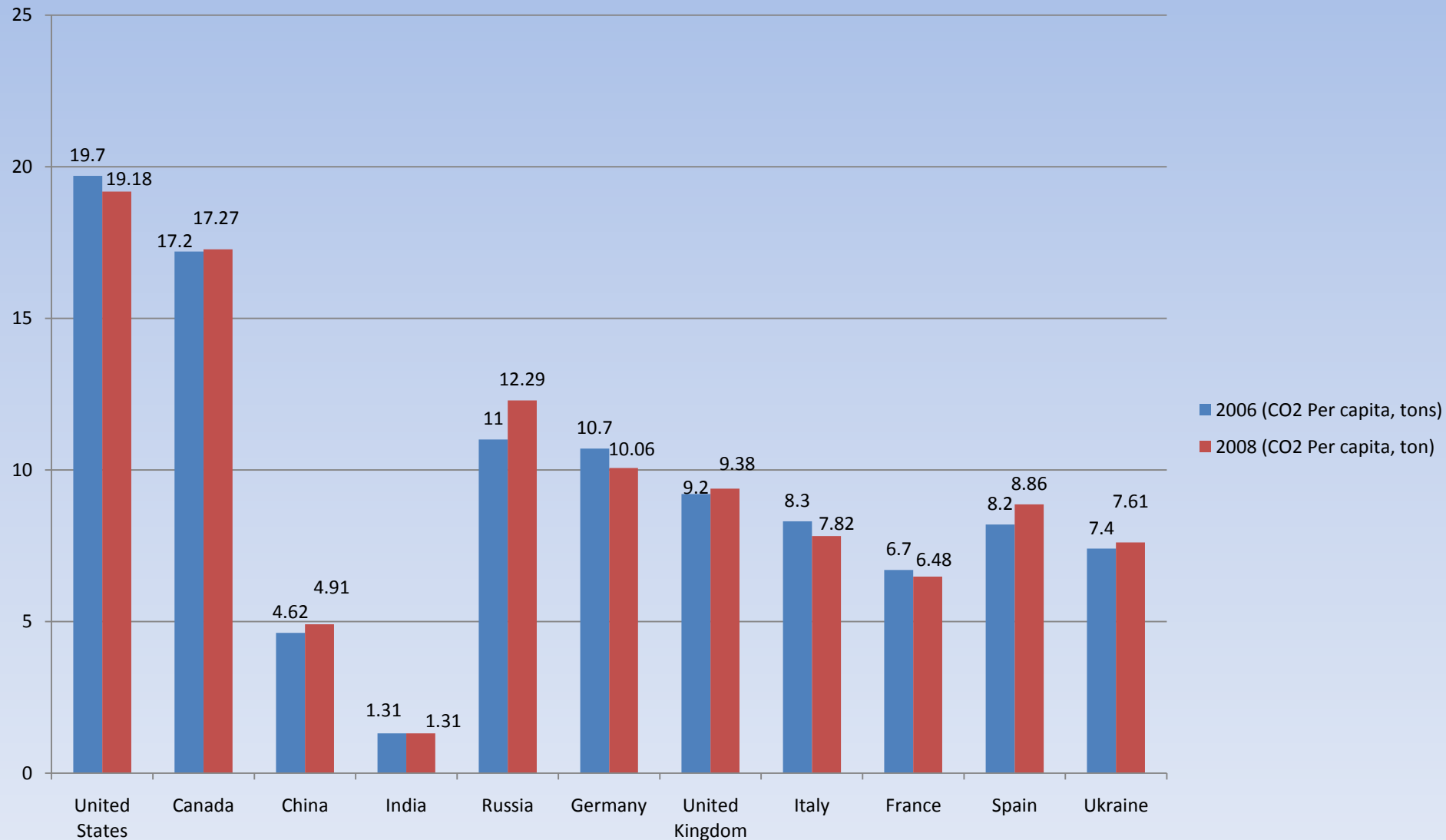


CO2 (Tons Per Capita)

Global Trend in Emissions (1990-2004)



Global Trend in Emissions (2006-2008): After Implementation of EU ETS



Economics Impact of Cap and Trade

- “...in terms of impacts on the national economy (i.e. GDP) the effects [of the EU ETS] are probably small. The direct costs of EU ETS are 0,2% of GDP (for an emission price of €20/ton CO₂) of which about half can be passed on to the customers. Impacts on the competitive position may occur in the vulnerable sectors but these sectors are in general the smaller sectors of the Dutch economy - with the exception of the iron and steel industry (in total 1,1% of GDP). In addition, if international climate policy until the year 2020 will result in more countries agreeing on binding reduction targets, impacts on competitiveness will be smaller than analyzed here.” – from “Impacts on Competitiveness from EU ETS: An Analysis of the Dutch Industry” by Bruyn, Nelissen, Korteland, Davidson, Faber, Vreede
- The authors go on to argue that while an auction allocation of emissions permits would be more efficient, it would be associated with a higher cost to the economy

Policy Recommendation for U.S.

- The EU ETS has had little success in reducing emissions and has had other problems (permit allocations, windfall profits, transportation sector...).
- But, the EU ETS is still in its initial stages and is expected to significantly reduce future emissions (plans to reduce emissions by 21% by the year 2020 from 2005 levels).
- The EU ETS will hopefully improve on problems as more experience is gained with Emissions Trading.
- The United States needs some type of program to deal with greenhouse gas emissions.
- Cap and Trade systems have become the most accepted systems for emissions reduction.
- Based on recent U.S. political happenings and national popularity of a Cap and Trade bill, a U.S. Cap and Trade system seems unlikely in the near future.