

The Economics of Climate Change

C 175 - Christian Traeger

Part 3: Policy Instruments

continued

Cap and Trade in application: US Lecture 14

US: Some non-GHG Cap & Trade Programs

- Acid Rain Trading (U.S. EPA), SO₂, Electricity Generation, 1995–Present
- Northeast NO_x Budget Trading & NO_x SIP Call (U.S. EPA), NO_x in the US Northeast, Stationary Sources, 1999–2003–Present
- RECLAIM (South Coast Quality Management District), NO_x and SO₂ in LA Basin, Stationary sources, 1994–Present

- Locally:
 - NO_x: formation of ozone or smog, which can affect human respiratory health.
 - SO₂: can cause or contribute to fine particulate matter pollution, which inhibits visibility and can affect human respiratory health

So locally both related to: Asthma, Allergies, and Chronical lung diseases
- Regional: Both causes of acid rain affecting plants/forests and aquatic animals

EU emissions trading compared to US NO_x and SO₂

Table 1. Comparison of key features of EU ETS and U.S. programs			
Features	U.S. SO₂ program	U.S. NO_x program	EU ETS
Sectors	Electric power Voluntary opt-in of industrial combustion sources	Electric power Large industrial combustion sources	Energy (including electric power, oil refineries, and coke ovens) Metal ore, iron, and steel production Minerals (including cement, lime, glass, and ceramics) Pulp and paper
Number of regulated sources	3,000 units ^a	2,400 units ^a	12,000–13,000 installations ^b
Number of political jurisdictions	1 (U.S. federal government)	22 (21 states and the District of Columbia)	25 member states
Emissions covered	SO ₂	NO _x	CO ₂ (Some or all of five other “Kyoto gases” may be added later.)
Project-level offsets?	No	No	Yes
Value of annual allocation	\$2.25 billion ^c	\$1.2 billion ^d	\$37 billion ^e

^a A “unit” is defined in U.S. trading programs as a combustion boiler. Thus, a power plant with five distinct boilers would be considered five units under the U.S. SO₂ and NO_x programs.

^b The classification of a regulated source of emissions is different in EU ETS than it is in the U.S. programs. An installation could consist of multiple sources of emissions that have a technical connection with the activities carried out at a site. For example, a power plant would be considered one installation, even though there are multiple boilers.

^c Assumes an annual allocation of 8.9 million tons and an allowance price of \$250 per ton.

^d Assumes an annual allocation of 500,000 tons and an allowance price of \$2,400 per ton.

^e Although the size of EU ETS cap will not be known until the National Allocation Plans for Phase II are final, an EU study was cited that estimates an annual value of 30 billion (\$37.5 billion) for allowances in EU ETS. See D. Harrison and D. Radov, *Evaluation of Alternative Initial Allocation Mechanisms in a European Union Greenhouse Gas Emissions Allowance Trading Scheme* (National Economic Research Associates, report prepared for DG Environment, 2002), available at <http://europa.eu.int/comm/environment/climat/pdf/allocation.pdf>.

SOURCE: J. A. Kruger and W. A. Pizer, 2004.

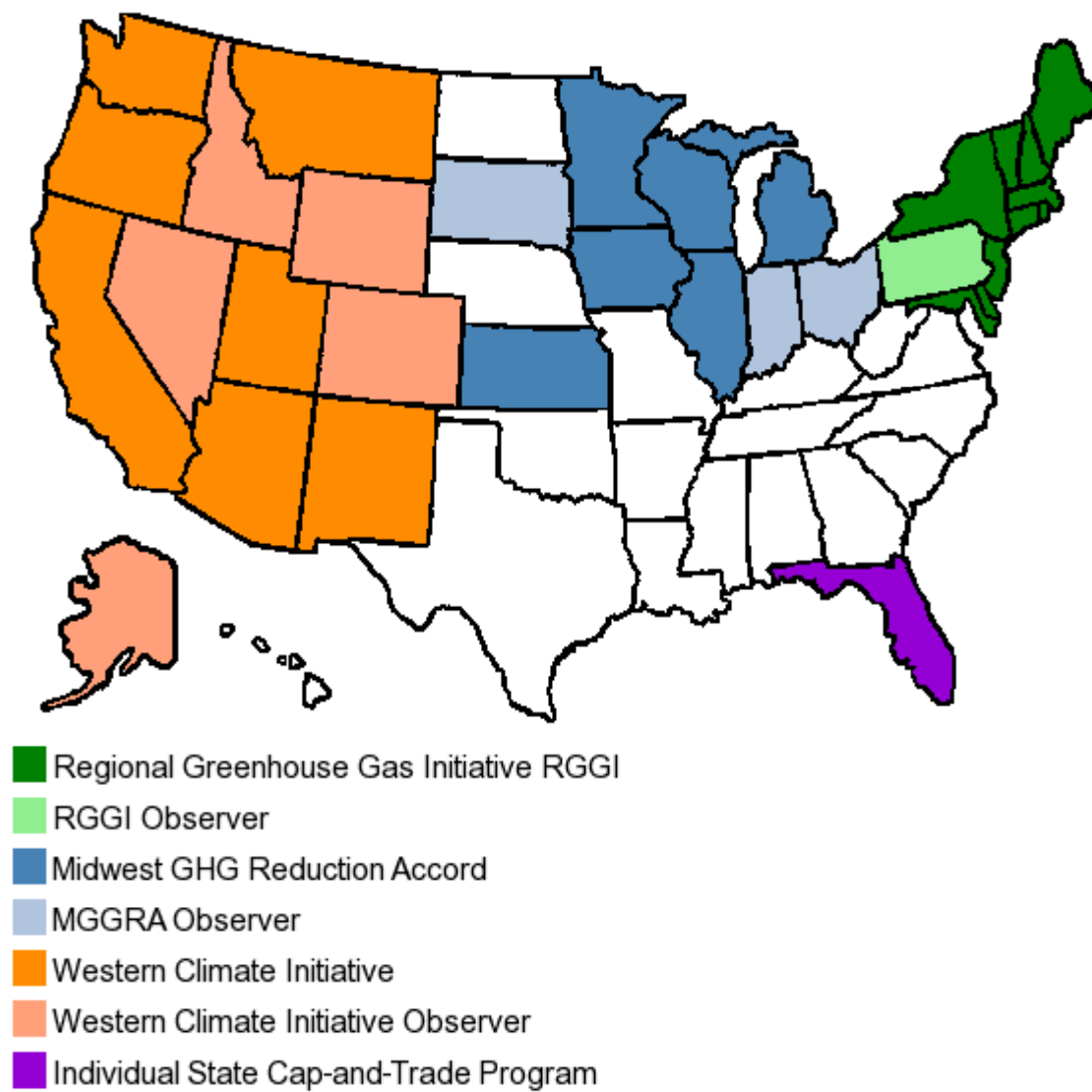
Source:
Kruger /
Pizer
2004

US Cap & Trade for GHGs – a recent national attempt

- Failed (in senate 2007/2008):
Lieberman-Warner Climate Security Act
- Cap & Trade with reduction of 63% below 2005 levels by 2050
- Initial allocation in 2012
 - Freely allocated allowances: 73.5%
 - Auction: 26.5%
- Banking –Unlimited banking of allowances
- Borrowing –15% of annual compliance obligation can be borrowed from future years at a 10% interest rate

US Cap & Trade for GHGs – Regional initiatives

- After failure of federal cap & trade initiative, states formed several regional initiatives to introduce cap & trade for GHG reduction
- Some of them collaborate also with Canadian provinces



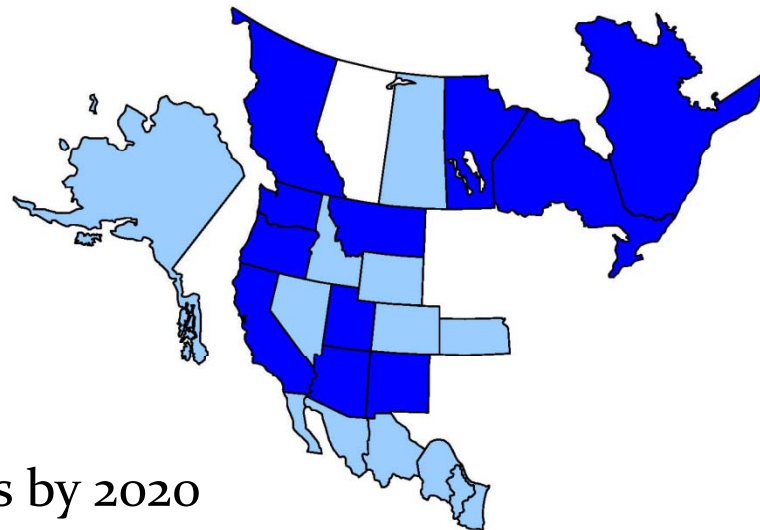
US Cap & Trade for GHGs – RGGI

- **Regional Greenhouse Gas Initiative (RGGI)**
- First mandatory U.S. cap-and-trade program for carbon dioxide
- begin by capping emissions at current levels in 2009, and then reducing emissions 10% by 2019
- covers power plants of at least 25 megawatts that burn more than 50% fossil fuel
- Banking: Yes
- Borrowing: No
- CO₂ Allowance Prices:
Auction 1: 9/2008 \$3.07
Auction 2: 12/2008 \$3.38
- Next Auction: 3/18/2009
- Auction large fraction (must auction 25%, most states auction 100%)



US Cap & Trade for GHGs – WCI

- **Western Climate Initiative (WCI)**
- 7 U.S. states and 4 Canadian provinces + observers (light blue)
- GHG target: 15 percent below 2005 levels by 2020
- Will cover 90% of GHG emissions when fully implemented.
- 1st phase: starts 2012, will cover emissions from electricity and large industrial and commercial sources
- 2nd phase: starts 2015, will expand to cover emissions from transportation and residential, commercial, and industrial fuel use not otherwise covered
- Start with auctioning at least 25% and increase share over time
- Banking: Yes
- Borrowing: No



US Cap & Trade for GHGs - MGGRA

- Midwest Greenhouse Gas Reduction Accord (MGGRA)
- Long-term targets 60-80% below current emissions
- Multi-sector cap & trade
- Details expected soon
- Implementation should begin 2010



An example of standards: CAFE

- Corporate Average Fuel Economy (CAFE)
- Set by US Environmental Protection Agency (EPA)
- Sets fuel efficiency standards for miles per gallon (mpg)
- regulates passenger cars and (now) light trucks
- Fleet average is calculated as production weighted harmonic mean
 - > produces lower mean than arithmetic (standard) mean
 - > ...?...
- Manufacturer's pay fine per (deci-) mpg under the standard and car in the fleet
- Law was passed in response to Arab oil embargo in 1975
- Standard had increased over time (and declared plans to increase further)