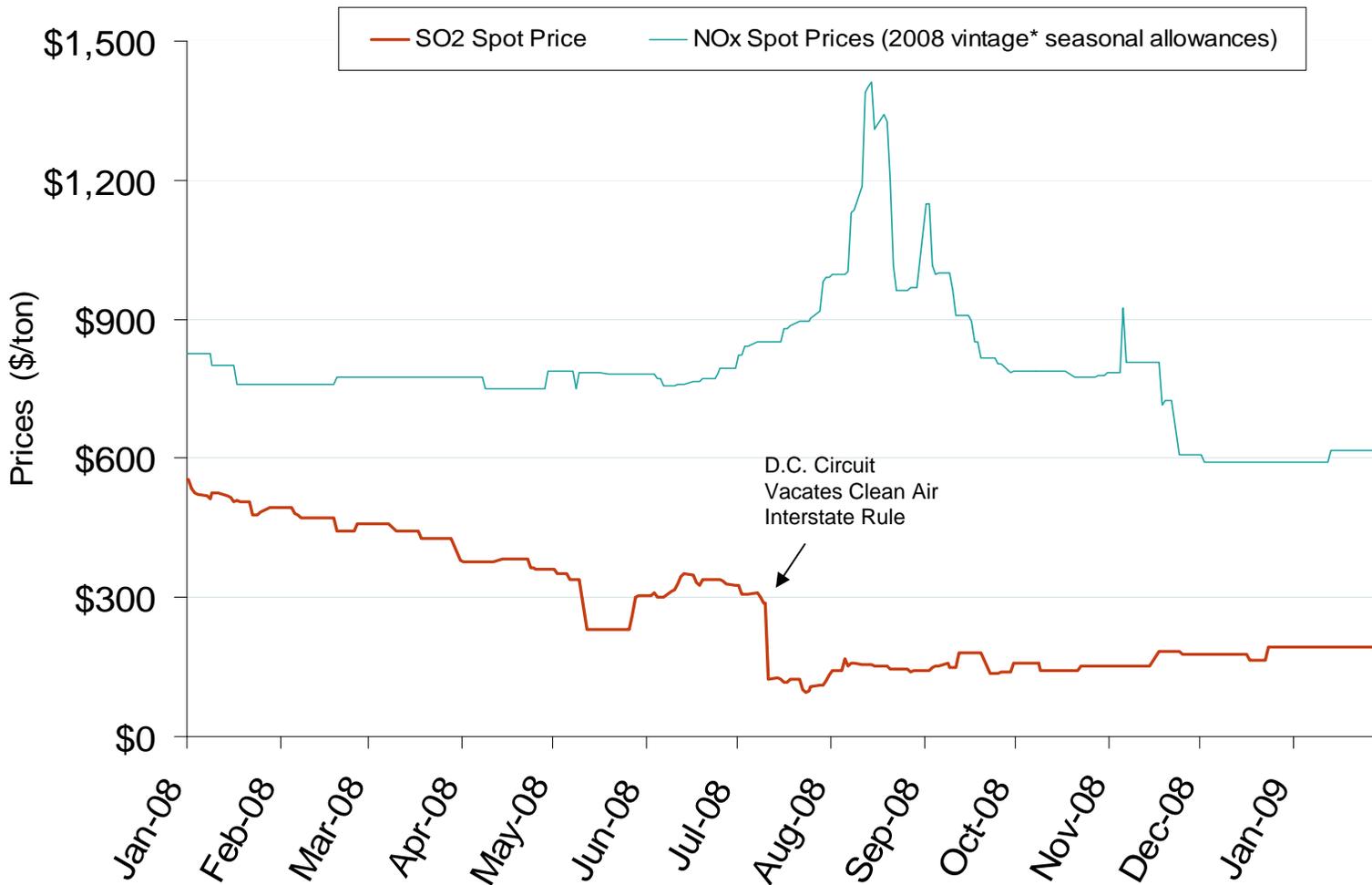


SO₂ Allowance Spot Prices and NOx Seasonal Allowance Spot Prices



Source: Derived from *Cantor Fitzgerald* data.

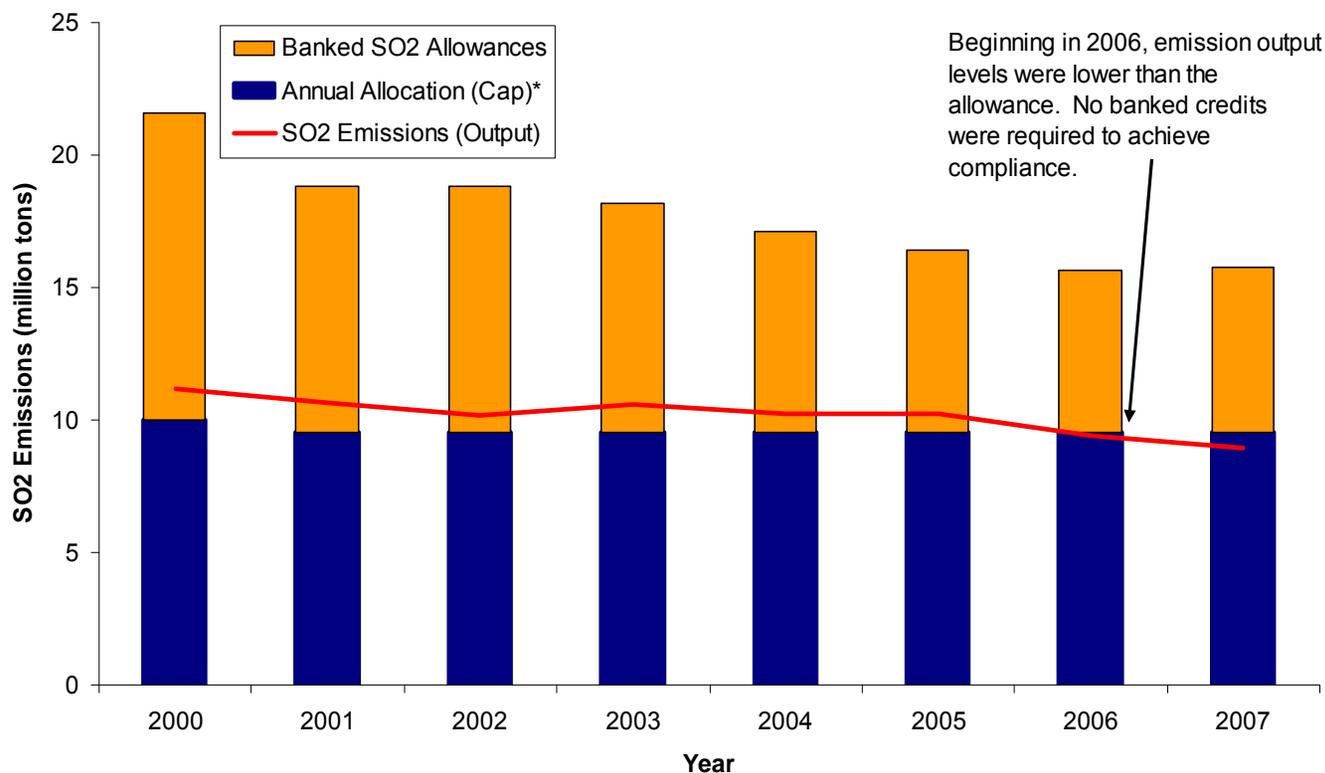
* Earliest year an allowance may be applied against emissions.

Updated February 6, 2009

3004

SO₂ Allowances Available for Compliance and SO₂ Emission Output under Cap-and-Trade

SO₂ Allowances Available for Compliance and SO₂ Emission Output under Cap-and-Trade



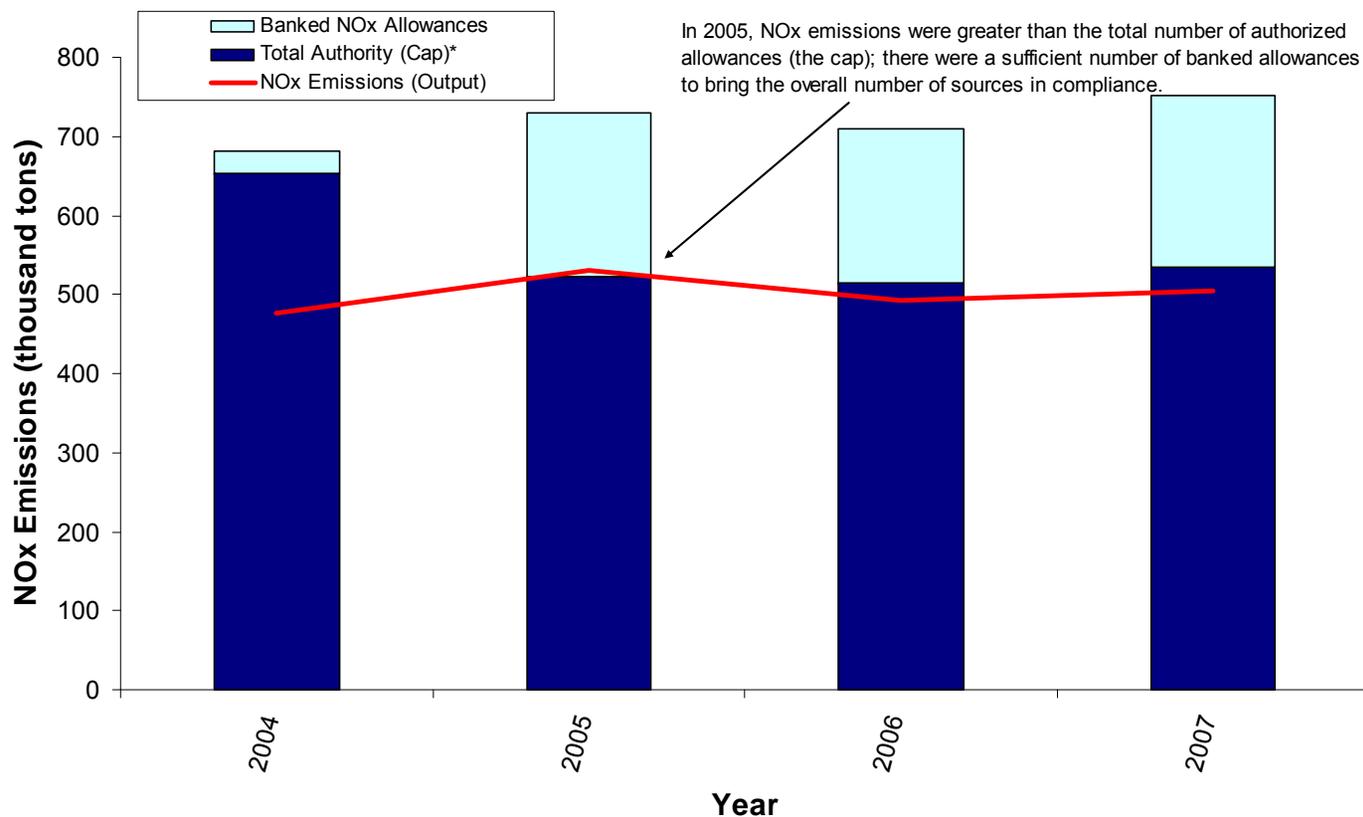
Source: EPA

See overview on following slide.

Updated December 5, 2008

3030

NOx Allowances Available for Compliance and NOx Emission Output under Cap-and-Trade



Source: EPA

See notes on following slide.

Updated October 9, 2008

3031

Brief Overview of the SO₂ and NO_x Emissions Markets

The electric power industry is a major source of sulfur dioxide emissions (SO₂) and nitrogen dioxide emissions (NO_x) – both precursors of acid rain and smog. According to the Environmental Protection Agency's (EPA) 2006 Acid Rain Progress Report, the power sector is responsible for 70% of SO₂ emissions and 20% of NO_x emissions. Currently US policy encourages reduction in SO₂ and NO_x emissions which can be achieved through a cap and trade program. This market based model also allows for relative flexibility in compliance options. An emitting source may choose pollution control technology such as add-on controls like flue gas desulfurization (FGD) for SO₂ and selective catalytic reduction (SCR) for NO_x, fuel switching, and/or participation in the respective cap and trade markets. The decision is primarily driven by the regulatory environment, fuel input type, the level of emission output, and compliance costs, the latter of which affects wholesale and retail prices.

The Acid Rain Program

<http://www.epa.gov/airmarkets/progsregs/arp/index.html>

EPA's Acid Rain Program (ARP), established under the 1990 Clean Air Act Amendments, requires reductions of SO₂ and NO_x emissions from the electric power industry. The Acid Rain Program was the first cap and trade program implemented nationwide to reduce SO₂ emissions.^[1] The SO₂ program set a permanent cap on the total amount of SO₂ that can be emitted by fossil fuel-fired generating units and allows allowance trading so affected sources have some flexibility in their compliance method. Currently, SO₂ sources must surrender one allowance to emit one ton of SO₂. If a source falls short on the number of allowances it needs to comply with its individual cap, it can purchase allowances from another source that has a surplus of allowances. An emitting source may have a surplus of allowances for several reasons. For example, if it chose to install and/or run scrubbers, it can "bank" those unused allowances for future use or sell the leftover allowances to other emitting sources.

The NO_x Budget Trading Program

<http://www.epa.gov/airmarkets/cap-trade/docs/nox.pdf>

In 2003, the cap-and-trade method was also implemented to reduce seasonal (primarily summer) NO_x emissions from fossil fuel-fired plants. While the EPA administers the program, states are required to share the responsibility for allowance allocation and enforcement. Currently, NO_x sources must surrender one allowance to emit one ton of NO_x.

^[1] The Acid Rain Program also required NO_x emission reductions by select coal units but under a rate-based regulatory program [<http://www.epa.gov/airmarkets/progsregs/arp/nox.html>].

Collaborative Greenhouse Gas (GHG) Programs

Collaborative Regional GHG Programs:

- Three North American groups with goals to lower regional GHG emissions were initiated by state Governors.
- 32 U.S. states, D.C., eight Canadian provinces, and six Mexican states are Participants or Observers.
- Observer jurisdictions do not commit to group GHG reduction goals, but participate in proceedings should they opt to join later. RGGI Observers are not on its Board.

Western Climate Initiative (WCI):

- Created February 2007
- Partners: 7 states, 4 provinces; Observers: 5 states, 1 province*
- WCI announced its design for a market-based, *multi-sector* cap-and-trade program, Sept 2008:
 - 15% CO₂ reduction below 2005 levels by 2020
 - Phase I to take effect Jan 2012

Midwest Greenhouse Gas Reduction Accord:

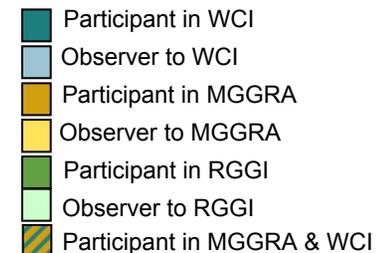
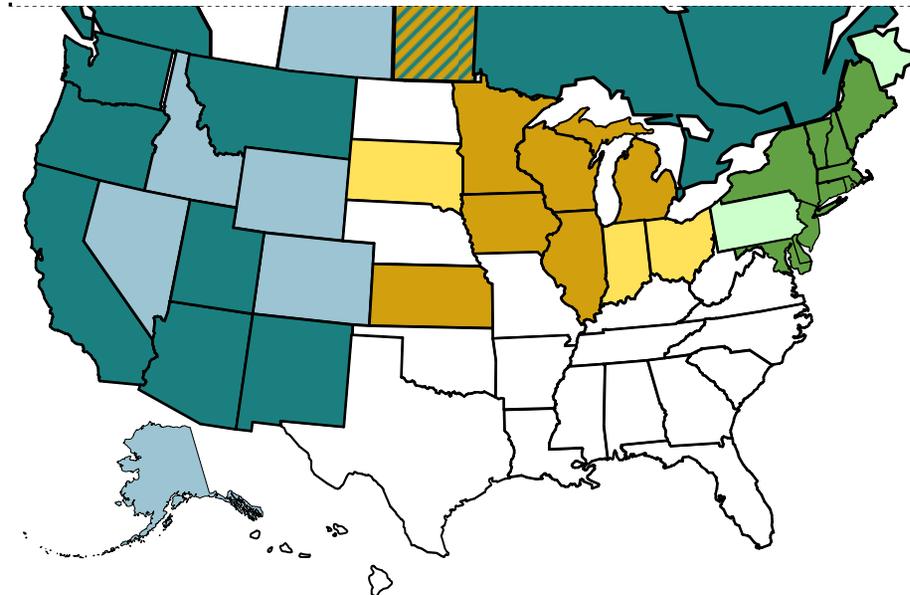
- Established November 2007
- Participants: 6 states, 1 province; 3 Observer states, 1 province
- Preliminary Design Recommendations issued Dec 2008: 15 - 25% reductions by 2020, 60 - 80% by 2050

Regional Greenhouse Gas Initiative (RGGI):

- Compliance period began Jan 1, 2009
- 10 Participant states; 5 Observers jurisdictions
- Market-based cap-and-trade effort to reduce *power-sector* CO₂ emissions.
- 10% CO₂ reduction by 2018 covers over 200 plants
- 188 million allowances (to be) sold in 2 pre-compliance auctions (2008) and 4 compliance auctions (2009)

Auctions:

1. **9/25/08:** 12.5 million allowances sold by 6 states cleared at \$3.07/allowance
2. **12/17/08:** 31.5 million allowances sold by all 10 states cleared at \$3.38/allowance
3. **3/18/09:** 1st compliance auction, 10 states to sell 31.5 million 2009 allowances and 2.2 million 2012 vintage allowances



Updates at: <http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-ghg.pdf>

Notes: Kansas is a MGGRA participant and WCI observer. Ontario and Quebec are Partners to WCI and Observers to RGGI; Ontario is also an observer to RGGI.

Sources: regional initiatives - www.rggi.org, www.midwesternaccord.org, www.westernclimateinitiative.org, trade press, Pew Center, White House - www.whitehouse.gov/agenda/energy_and_environment

Updated January 27, 2009

3032

Collaborative Greenhouse Gas Programs

White House Energy & Environment Agenda:

- President Obama has called for an economy-wide cap-and-trade program to reduce emissions to 1990 levels by 2020 and to reduce them an additional 80% by 2050.

RGGI's Auction 2 held on December 17, 2008:

- Six states from 1st auction sell 1/6 of 2008-09 allowances in Auctions 1-6: CT, MA, ME, MD, RI, VT.
- DE, NH, NJ, and NY passed legislation necessary to participate in auctions; they sell 20% of allowances in each of Auctions 2-6.
- 69 entities bid for 3.5 times the available 31.5 million allowances in Auction 2, raising \$106.5 million.
- Of 46 winning entities, 85% were compliance entities (generators), and 12% were financial institutions or traders.
- Shares cleared at \$3.38/allowance, 31¢ higher than Auction 1, although the base price remained at \$1.86/allowance.

RGGI Updates:

- The 1st compliance auction is scheduled for March 18.
- Ten states will sell 31.5 million 2009 vintage allowances and 2.2 million 2012 vintage allowances.
- Ten participating RGGI states and Pennsylvania signed a Letter of Intent that commits them to develop a regional Low-Carbon Fuel Standard (LCFS) they describe as a market-based, technology-neutral policy (Dec 31). It requires reductions in the average lifecycle GHG emissions per unit of energy. Signatories from environment and energy agencies committed to a draft MOU on a regional program to be forwarded to the 11 governors by December 31, 2009.

Midwest Greenhouse Gas Regional Accord:

- Signed at Midwestern Governors Association Energy Summit to establish GHG reduction targets (Nov 2007).
 - Participants: IA, IL, KS, Manitoba, MI, MN, WI
 - Observers: IN, OH, Ontario, SD
- Preliminary Design Recommendations issued (Dec 2008)
 - Target reductions from 2005 levels:
 - 15% - 25% reductions by 2020
 - 60% - 80% reductions by 2050
 - Cap-and-trade should cover multiple sectors:
 - electric generation and imports (power plants)
 - Industrial combustion sources (factories)
 - Industrial processes, if measurable and verifiable
 - Transportation fuels, subject to modeling results
 - Each jurisdiction to control allowance distribution methods.
 - Final design pending results of further ICF modeling.
- MGGRA anticipates Model Rule by August 2009.

Western Climate Initiative (WCI):

- Launched by WGA to reduce regional GHG collectively and cooperatively (Feb 2007).
 - Partners: AZ, British Columbia, CA, Manitoba, MT, NM, Ontario, OR, Quebec, UT, WA
 - Observers: AK, CO, ID, KS, NV, Sask., WY
- WCI announced design for a market-based, *multi-sector* cap-and-trade program (Sept 2008):
 - 15% CO₂ reduction below 2005 levels by 2020
 - Covers 90% of regional emissions
 - Phase I to take effect Jan 2012
 - Phase II will begin 2015