

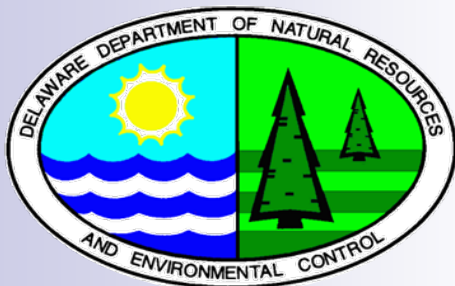
Regional Greenhouse Gas Initiative

A Model for Addressing Climate Change in the Northeast and Mid-Atlantic

Presented by: Valerie Gray, DNREC-AQMS
Climate 360 Seminar

Air & Waste Management Association

February 3, 2009



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Climate change...

- In the past few decades, the Arctic average temperature has risen at almost twice the rate of the rest of the world. Researchers say the floating sea ice in the Arctic Circle is probably on an accelerating, long-term decline.
- As mountain and land glaciers and the Greenland Ice Sheet melt, sea levels will rise, threatening low-lying populations around the world.
- International science panels attribute the rise in carbon dioxide to large-scale burning of fossil fuels since the Industrial Revolution.



Commission for Glaciology of the Bavarian Academy of Sciences and Humanities

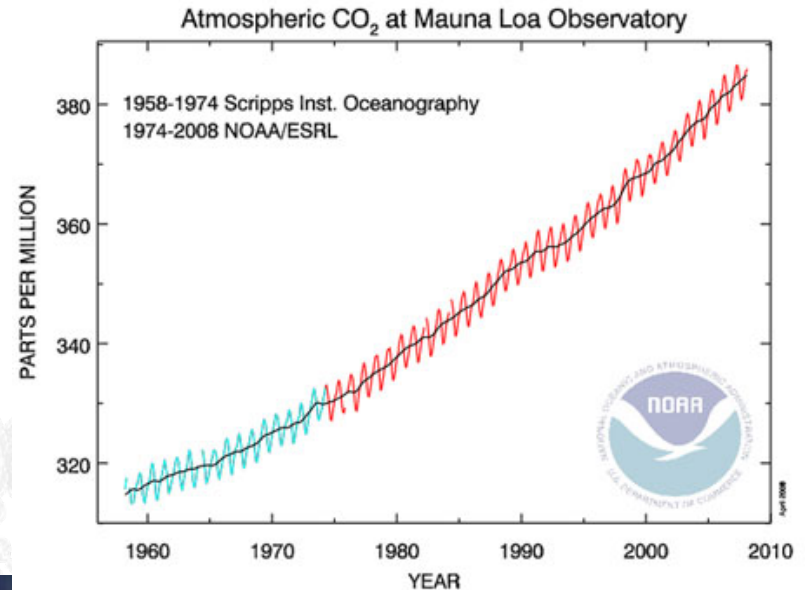


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Historical perspective

- Looking back 1,000 years, scientists see natural temperature fluctuations up to the post-Industrial Age.
- The temperature spike mirrors the rise of carbon dioxide concentrations in the atmosphere and the increase of carbon emissions from autos and industrial sources.
- Carbon dioxide in the atmosphere has increased 35 percent since before the Industrial Revolution, the highest level in the cores measured.



Pollution lingering above smokestacks

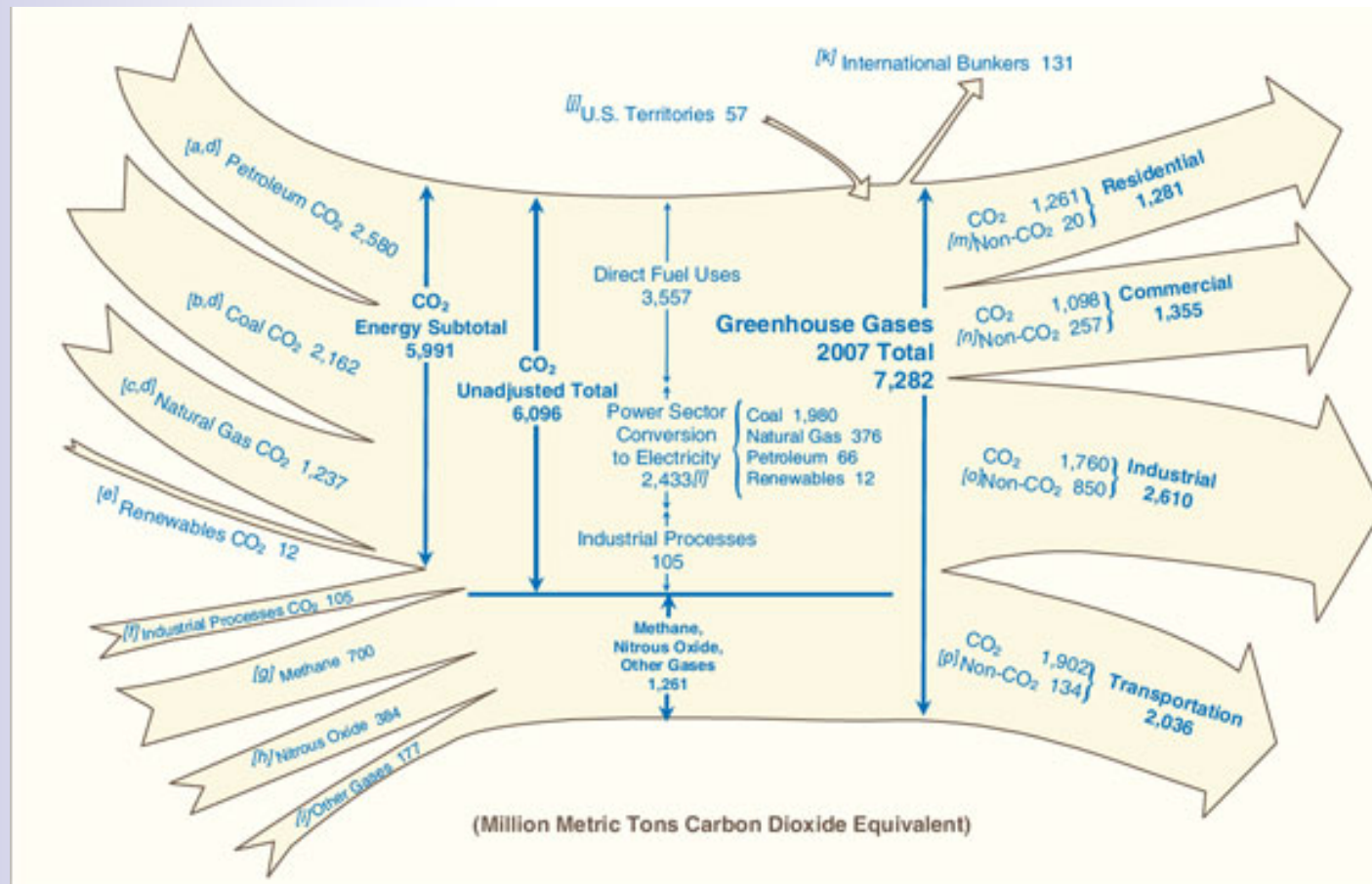
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Emissions of Greenhouse Gases in the United States 2007



Source: EIA, 2008

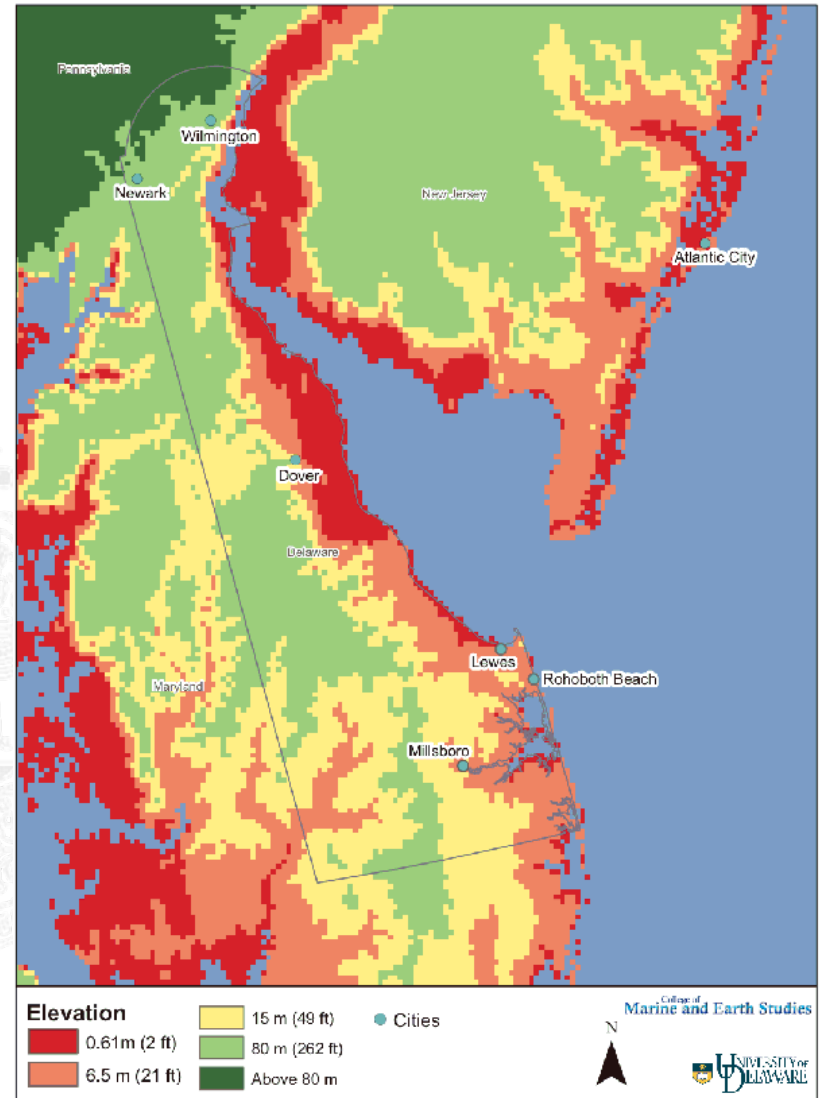


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Sea Level Rise

- Climate change is expected to raise sea level, change precipitation and impact other local climate conditions.
 - USEPA published SAP (4.1), *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region*. January 2009.
[<http://www.epa.gov/climatechange/effects/coastal/sap4-1.html>]



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Regional Greenhouse Gas Initiative

- The Regional Greenhouse Gas Initiative, or RGGI, is a cooperative effort by Northeastern and Mid-Atlantic states to reduce carbon dioxide emissions – a greenhouse gas that causes global warming.
- The states developed a regional strategy for controlling emissions. This strategy will more effectively control greenhouse gases, which are not bound by state or national borders.
- Central to this initiative is the implementation of a multi-state cap-and-trade program with a market-based emissions trading system.
- The program will require fossil-fuel fired electric power generators (≥ 25 MW) in participating states to reduce carbon dioxide emissions.



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Background

- Invitation from NY Governor Pataki (April 2003)
- Program Launch (July 2003)
- Action Plan developed (September 2003)
- Staff Working Group Package Proposal (August 2005)
- Memorandum of Understanding signed by Governors (December 2005)
- Model Rule published (August 2006)



- Auction 1 - RGGI CO₂ Allowances offered for sale by 6 states - CT, MA, ME, MD, NH, RI (September 2008)
- Delaware adopts Regulation 1147 – CO₂ Budget Trading Program (December 2008)
- Auction 2 - RGGI CO₂ Allowances offered for sale by all 10 RGGI states (December 2008)
- RGGI CO₂ Budget Trading Program first compliance period begins (January 2009)
- Auction 3 – scheduled March 18, 2009



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RGGI Program Goals

- Stabilize GHG emissions
- Create a market for carbon
- Demonstrate a state-led regional program can work
- Professional, predictable auction model
- Aggressive investment in energy efficiency and renewables



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RGGI Design Principles

- Reduce CO₂ with flexible, market-based program to achieve least cost reductions.
- Create model for federal program.
- Maintain electricity affordability, reliability and fuel diversity.
- Make expandable to other states.
- Build on programs in place.



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Cap-and-Trade v. Carbon Tax

■ Cap and Trade

- Binding quantitative limits based upon emissions reduction path.
- Implied flexibility in compliance.
- Fosters economically efficient outcome by lowering compliance costs.

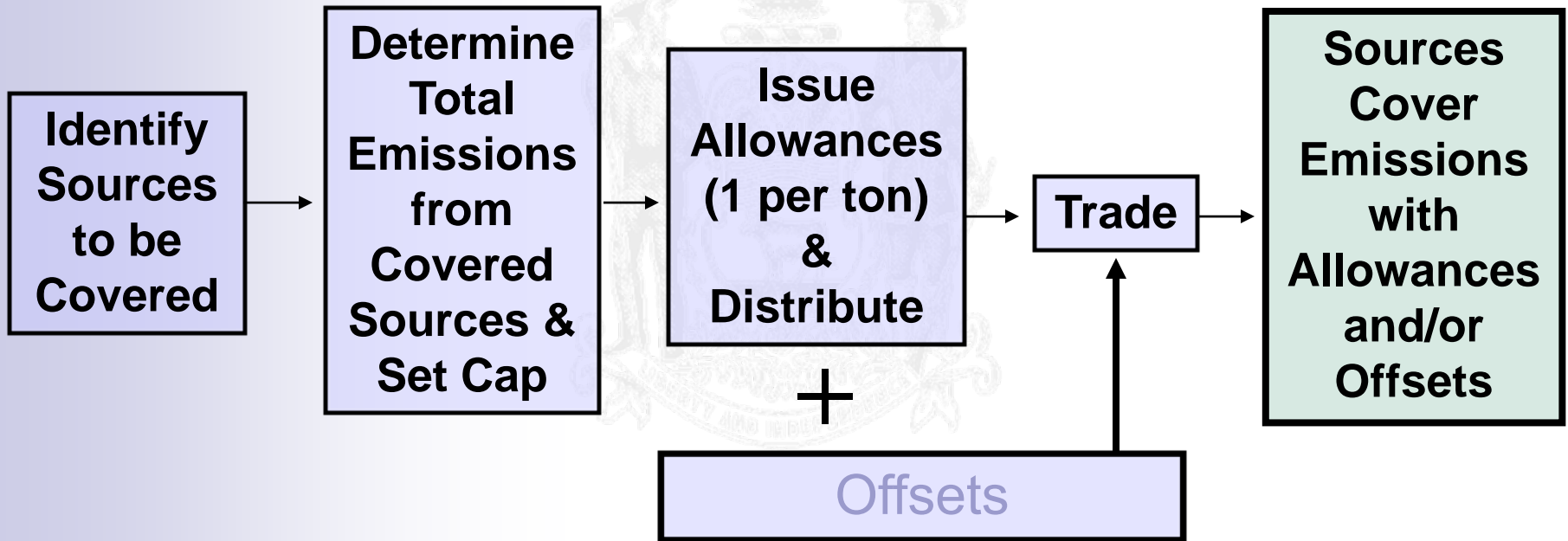
■ Carbon Tax

- Established price certainty intended to internalize environmental and societal damages associated with continued increase in emissions.
- Less vulnerable to gaming.
- Simpler to initiate and administer quickly.





Designing RGGI: A Cap-and-Trade Program



RGGI Program Components

- Start Date of January 1, 2009.
- Electric Generating Units \geq 25 Megawatts
- Two-Phase Cap
 - Stabilize Emissions through 2015
 - Reduce 10% by 2019.
- Comprehensive Review of Program in 2012.
- Offsets allowed to provide some flexibility.
- Price trigger safety valves to control costs.



RGGI State Allocations

1. Connecticut:	10,695,036 tons
2. Delaware:	7,559,787
3. Maine:	5,948,902
4. Maryland:	37,503,983
5. Massachusetts:	26,660,204
6. New Hampshire:	8,620,460
7. New Jersey:	22,892,730
8. New York:	64,310,805
9. Rhode Island:	2,659,239
10. Vermont:	<u>1,225,830</u>
	188,076,976 tons

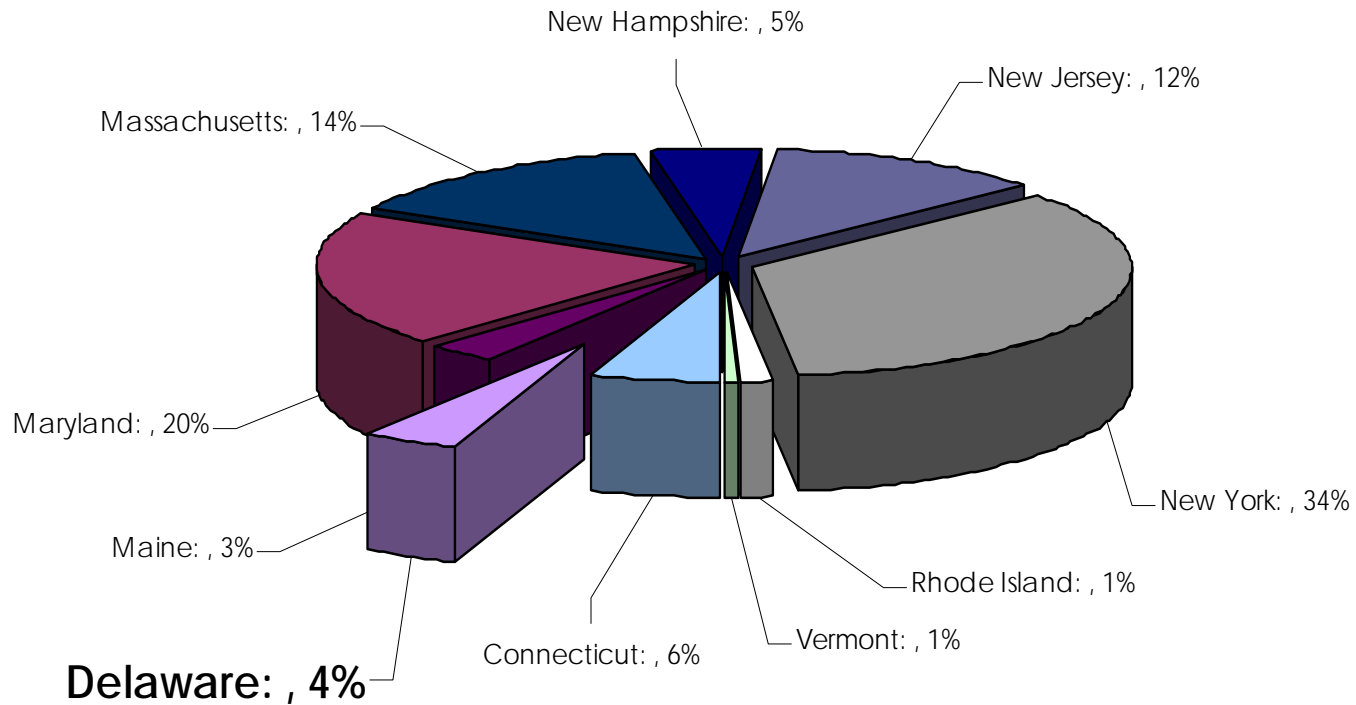
*Based on adjusted actual annual average emissions from all affected facilities (2000-2002)



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RGGI CO₂ Budget by State

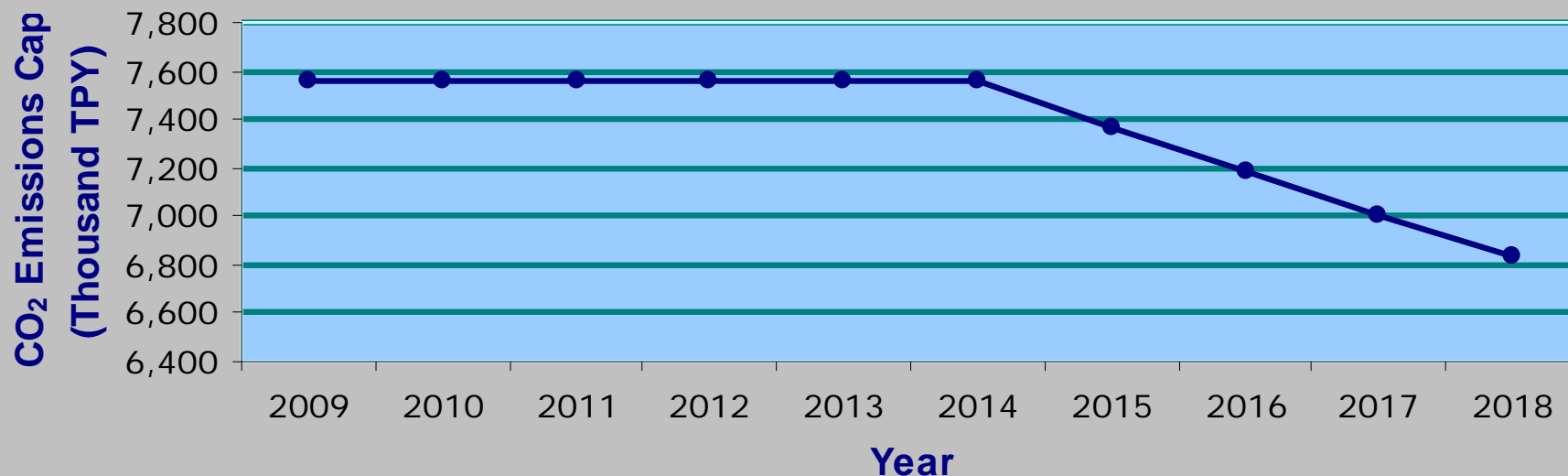


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Delaware's RGGI CO₂ Emissions Allocation

7,559,787 tons



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Delaware Power Plants

Facility (units)	Unit types	Generation (MW)	Installation Year	Fuel type	2000-2002 Average CO ₂ Emissions (Tons/year)
NRG Indian River (4)	ST	82, 82, 177, 442	1957, 1959, 1970, 1980	Coal	3,063,258
Conectiv Christiana	CT	29, 29	1973, 1973	Diesel Oil	4,588
Conectiv Edge Moor (3)	ST	75, 177, 446	1954, 1966, 1973	Coal (Residual Oil)	2,293,849
Conectiv Hay Road (8)	CC WH	115, 115, 115, 115, 122, 122, 195, 200	1989, 1990, 2001*	Pipeline Natural Gas/ waste heat	1,017,746
Dover - McKee Run (1)	ST	114	1975	Residual Oil	154,711
Dover - Van Sant (1)	CT	45	1991	Diesel Oil	5,290
DEMEC - W. Beasley (1)	CT	45	2002*	Natural Gas	13,946
NRG Dover (2)	CT	50, 50	2001*	Natural Gas	19,726
Premcor Refinery (6)	ST CT	28, 28, 63, 63, 90, 90	1956, 1961, 2000*	Residual Oil, Syn Gas	1,207,544

- Units over 25 MW – nameplate capacity
- CC – Combined Cycle
- CT – Combustion Turbine
- WH – Waste Heat
- ST – Steam Turbine

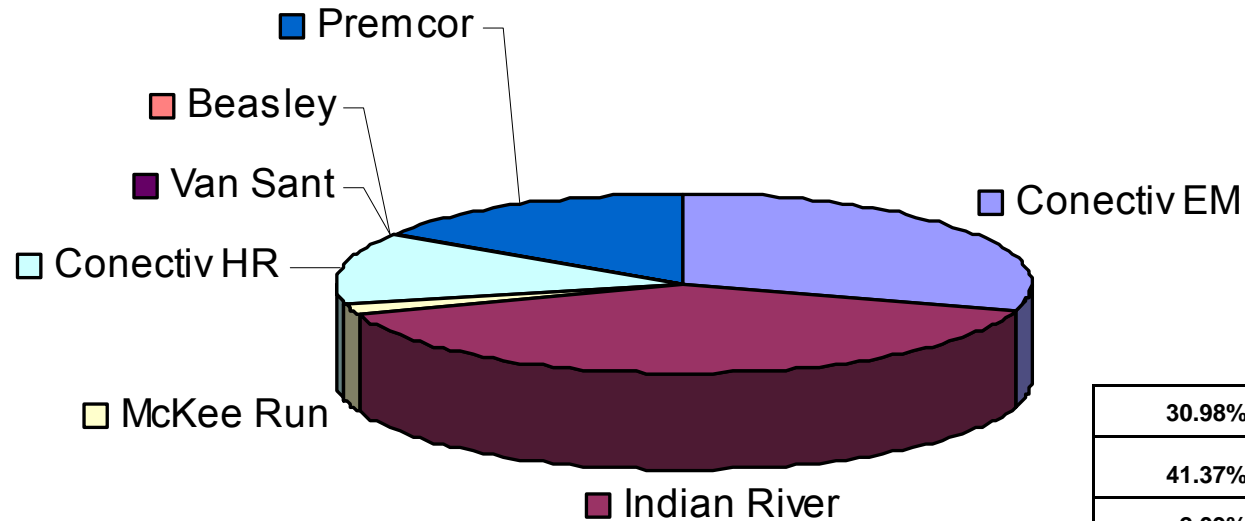
*Non-Acid Rain Units



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Average CO₂ emissions (2000-2002)



30.98%	Conectiv EM
41.37%	Indian River
2.09%	McKee Run
13.37%	Conectiv HR
0.07%	Van Sant
0.27%	Beasley
16.31%	Premcor

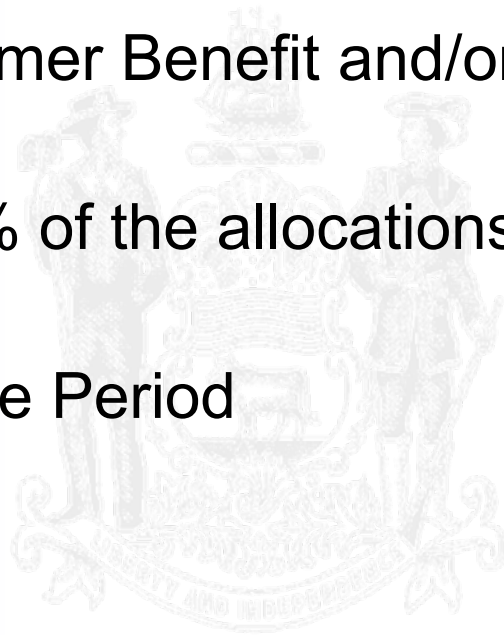


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RGGI Program Components

- Allocations:
 - 25% for Consumer Benefit and/or Strategic Energy Purpose
 - Remaining 75% of the allocations left to each state to allocate
- 3-Year Compliance Period
- Banking Allowed



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Delaware CO₂ Allowances

- SB 263 stipulates how the RGGI CO₂ allowances are to be auctioned or allocated.

Beginning with 2009 CO₂ allowances, the Secretary shall auction 60% of allowances available to Delaware and allocate 40% to generators in proportion to their average annual emissions from 2000-2002. The percentage of allowances auctioned by the Secretary shall increase by 8% per year, such that 100% of Delaware's allowances for 2014 shall be auctioned.



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Delaware's Allocation

Year	Percent Auctioned	Tons Auctioned*	Tons Allocated*
2009	60%	3,811,346	2,540,897
2010	68%	4,319,525	2,032,718
2011	76%	4,827,705	1,524,538
2012	84%	5,335,884	1,016,359
2013	92%	5,844,064	508,179
2014 - 2018	100% auction	6,352,243	0

*Less 1,207,544 tons from Refinery. Refinery requested permit condition to exempt the RGGI units from the regulation in accordance with Sections 1.2.2 Limited exemption for units with electrical output to the electric grid restricted by permit conditions and 5.3.4 Limited industrial exemption set-aside allocation.



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Delaware Auction Revenue

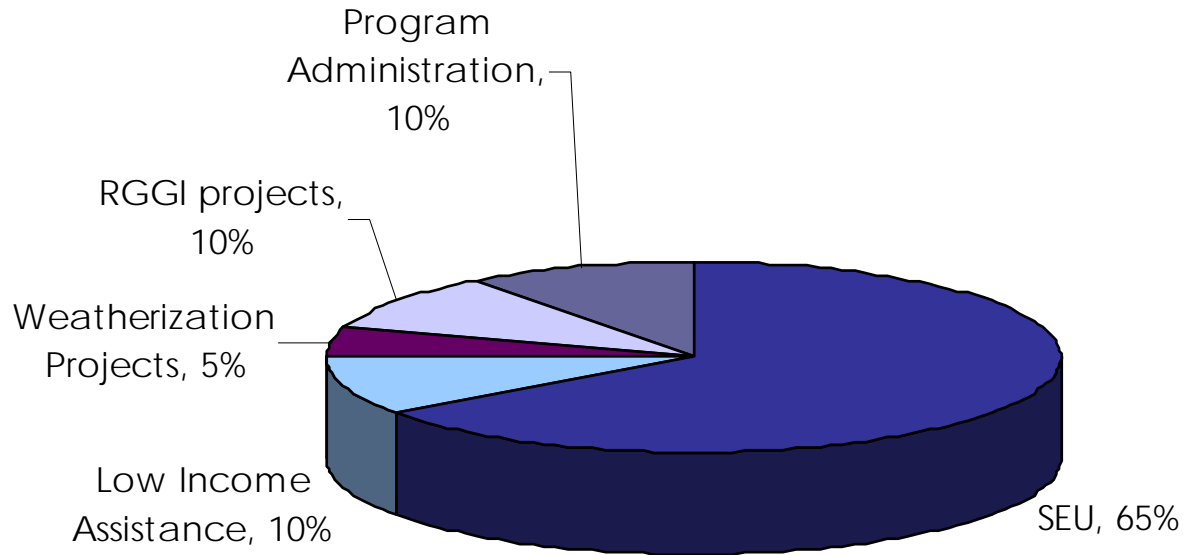
- All proceeds associated with the auction of CO2 allowances shall be directed to **Public Benefit Purposes**:
 - **65%** of the CO2 allowance proceeds shall be directed to the **Sustainable Energy Utility (SEU)**. The SEU shall apply these funds to further the goals and activities of the SEU including, but not limited to, the promotion of energy conservation, energy efficiency, renewable energy, and energy financing.
 - A total of **15%** of the CO2 allowance proceeds shall be directed to **low income consumers**, of which **10%** shall be directed to the federally funded and state administered **Weatherization Assistance Program (WAP)**, and up to **5%** shall be directed to the federally funded and state administered fuel assistance (LIHEAP) programs.
 - **10%** of CO2 allowance proceeds shall be directed to **Greenhouse Gas Reduction Projects**, selected by the Secretary following a periodic competitive proposal process.
 - shall use up to **10%** of CO2 allowance proceeds for **expenses for running the RGGI program**.



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RGGI Auction Proceeds



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RGGI Program Components

- **Offsets—project-based reductions:**

- Types:**

1. Landfill methane capture & destruction.
2. Reduction in emissions of sulfur hexafluoride (SF6)
3. Reduction/avoidance of CO2 emissions from natural gas, oil or propane end-use combustion due to end use energy efficiency.
4. Sequestration of carbon due afforestation
5. Avoided methane emissions from agricultural manure management.



Compliance and Tracking

- Three year compliance period means the first compliance demonstration is not until early 2012.
 - 2009, 2010, 2011 – *Demonstration by March 1, 2012*
 - 2012, 2013, 2014 – *Demonstration by March 1, 2015*
 - 2015, 2016, 2017 – *Demonstration by March 1, 2018*

- **CO2 Allowance Tracking System (COATS)** - Platform for managing participants' CO2 allowance accounts and emissions data from regulated sources. The system will also be used for tracking the status of emissions offset projects.
 - Based on USEPA's Clean Air Markets Division Emission Allowance Tracking System (EATS).
 - RGGI Contractor - Perrin Quarles Associates.
 - Currently working on development of System Reports and the Offset Module.



Regional Auction Design Elements

■ **Design Principle:**

- All allowances made available for auction by states, for a respective compliance period, will be offered for sale prior to the end of that compliance period.
- Future allowance vintages will be made available for sale in a quantity up to 50-percent of their respective annual allocation, and such offerings may be for allowances extending up to four allocation years into the future.

■ **Auction Structure and Format:**

- Allowances will be made available for sale on a quarterly basis in lot sizes of 1,000 allowances.
- The initial auction will offer allowances through a single-round, uniform-price, sealed-bid auction format. While the goal is to maintain a consistent auction format, flexibility will be retained to transition to a multiple-round, ascending-price auction format if necessary to address evolving market conditions.



Regional Auction Design Elements

■ Allowance Sale Schedule:

- Allowances will be identified with a vintage corresponding to the allowance's respective allocation year.
- All allowances made available for auction by states, for a respective compliance period, will be offered for sale prior to the end of that compliance period.
- Future allowance vintages will be made available for sale in a quantity up to 50-percent of their respective annual allocation, and such offerings may be for allowances extending up to four allocation years into the future.

■ Participation:

- All market participants will be eligible to participate in the initial auction, provided they meet applicable qualification requirements, which will include provision of financial security.
- Flexibility will be retained to limit participant eligibility in subsequent auctions.
- Auction rules will establish a total limit for the number of allowances that entities (e.g., an organization and its affiliates and/or agents) may purchase in a single auction, equivalent to 25-percent of the allowances offered for sale in any single auction.



Regional Auction Design Elements

■ Reserve Price:

- A reserve price of \$1.86 per allowance will apply to the first auction. After the first auction, a reserve price will be in effect that is the higher of \$1.86 per allowance, as adjusted annually from 2009 onward based on the Consumer Price Index, or 80-percent of the current market price³ of the particular RGGI allowance vintage being auctioned. A reserve price based on the current market price will only be used if representatives from participating states determine that there are sufficient, reliable market data available to establish a valid current market price. The reserve price will be made known to prospective auction participants prior to each auction.

■ Unsold Allowances:

- Any unsold allowances will be made available for sale in future auctions in which a reserve price based on the current market price is being used. In 2012, as part of the first program review envisioned in the December 2005 RGGI Memorandum of Understanding, a decision will be made by the participating states as to whether to retire any unsold allowances from the first compliance period, or to offer these allowances for sale in subsequent auctions during the second compliance period.



Regional Auction Design Elements

■ **Notice of Auctions:**

- A public notice of auction will be provided at least 45 days prior to each auction. Such notification will be posted on a publicly available RGGI auction web site and will be made available by states in accordance with any applicable state rules, regulations and/or administrative procedures.
- Each auction notice will provide at a minimum: the date, time, and location of the auction, the categories of eligible bidders, any requirements established for qualified participants, the quantity of allowances to be auctioned, and all other relevant information and procedures necessary for prospective bidders to participate in such auction.

■ **Monitoring:**

- The participating states will retain a professional independent market monitor to monitor auctions and subsequent market activity.
- The independent monitor will observe the conduct of the auction qualification process and the conduct of the auction itself.
- Based on such monitoring, the independent monitor will provide the participating states with a timely report of whether the auction was conducted in accordance with the regulations established by participating states and the noticed procedures and requirements that apply to qualified auction participants.



Regional Auction Design Elements

■ Auction Results:

- Upon approval by the participating states of the auction outcome and upon payment in full by successful bidders to the respective participating states, each state shall transfer the corresponding CO2 allowances to each successful bidder's applicable account in the CO2 allowance tracking system.
- States will retain full regulatory authority for transferring allowances from their respective state accounts to winning bidders, contingent on approval of auction results and financial settlement.
- Within a reasonable period of time following each auction, the participating states shall publish on the RGGI auction website the auction clearing price and the total amount of allowances sold in such auction.



- The participating states have come to a mutual understanding to the following schedule for making each participating state's CO2 Allowances available for sale:
 - 1) CO2 Allowances of allocation years falling within the first control period will be made available for sale by each participating state in an evenly distributed manner during the first control period.
 - 2) For the September 25, 2008 auction, only 2009 allocation year CO2 Allowances will be made available for sale.
 - 3) By the end of 2009, 5% of available 2012 allocation year CO2 Allowances will be made available for sale. The schedule for future control period CO2 allowances that will be made available for sale in 2010 and 2011 is yet to be determined.



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First Auction:

- September 25, 2008
- 12.5 million allowances auctioned by 6 states
- 59 separate entities submitted bids, 44 entities purchased allowances (80 percent sold to compliance entities)
 - Demand outpaced supply 4:1
 - \$1.86 Reserve Price
 - \$3.07 Clearing Price
 - \$38.5 million total proceeds
- **Market Monitor, Potomac Economics: “Auction raised no material concerns...”**



Second Auction:

- December 17, 2008
- 31.5 million allowances auctioned by 10 states
- 69 separate entities submitted bids, 46 entities purchased allowances (80 percent sold to compliance entities)
 - Demand outpaced supply 3.5:1
 - \$1.86 Reserve Price
 - \$3.38 Clearing Price
 - \$106.5 million total proceeds (\$2.5 million to DE)
- **Market Monitor, Potomac Economics: Again approved the auction results.**



Third Auction: Will be Held

- March 18, 2009
- All 10 RGGI states plan to participate
- \$1.86 Reserve Price
- 2009 allowances - quantities similar to Auction 2

- **Any Changes?**
 - A small quantity of 2012 allowances (future compliance period allowances) 2.2 Million Tons
 - Auction schedule at:
http://rggi.org/docs/Auction_Notice_Jan_12_2009_Schedule.pdf



- The participating states have come to a mutual understanding on dates for regional auctions to be held in 2008 and 2009.
 - Thursday, September 25, 2008 ✓
 - Wednesday, December 17, 2008 ✓
 - **Wednesday, March 18, 2009**
 - Wednesday, June 17, 2009
 - Wednesday, September 16, 2009*
 - Wednesday, December 16, 2009*

**Tentative date*



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What's Next?

- Offsets
- Future areas of collaboration:
 - Low carbon fuel standard (LCFS)
 - CA LEV program (8/10 RGGI states have adopted)
- GHG reporting
 - 10 states require GHG reporting: CA, CT, MA, ME, NV, NJ, NM, OR, WA
- DE requires voluntary GHG reporting from regulated entities
- Anticipated RGGI would expand to other sectors



Federal Program

- RGGI designed as glide path for federal action
- RGGI has brought energy/environmental agencies together in unprecedented ways.
- We will insist:
 - Strong state-federal partnership
 - Credit to states who have implemented GHG policy
 - Support at least at the RGGI level
 - State role: monitoring, reporting, permitting, energy efficiency, siting & building renewables



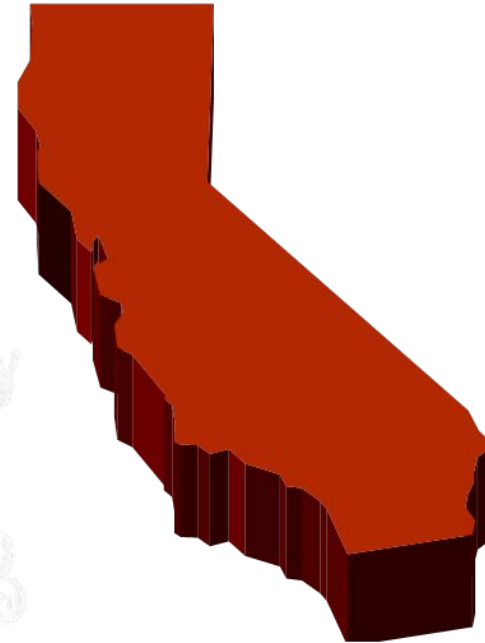
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Other Market-based Initiatives

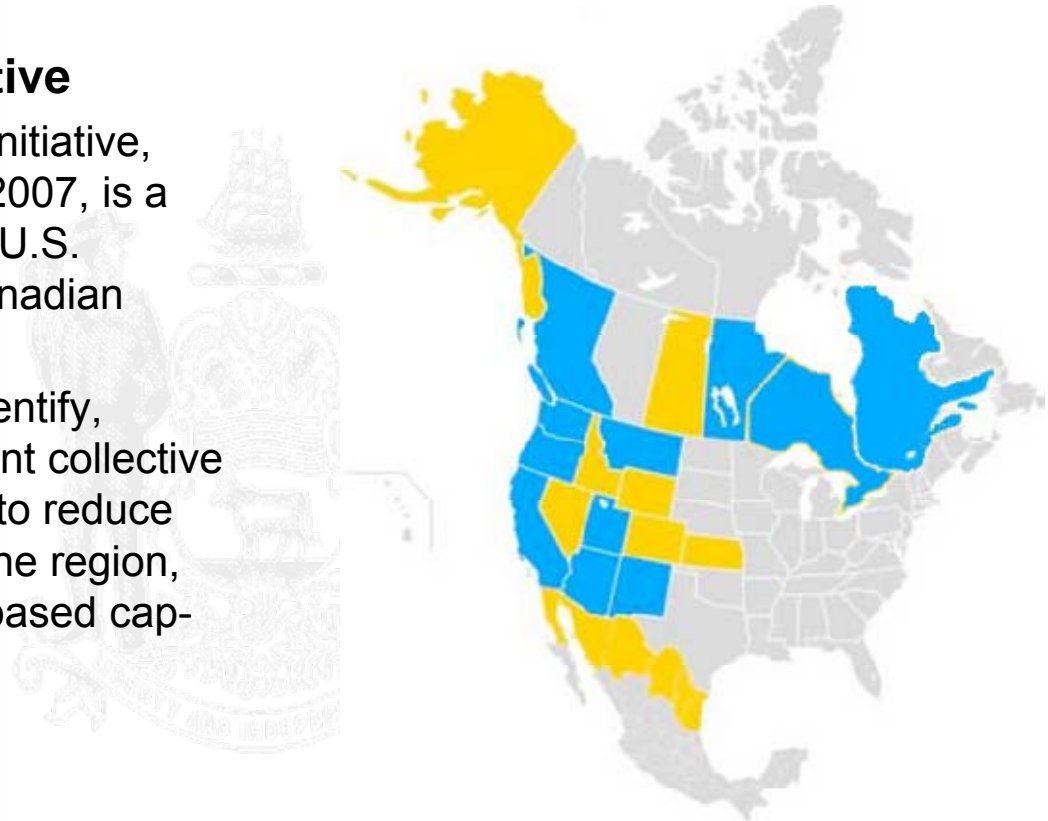
■ California's AB32

- California's major initiatives for reducing climate change or greenhouse gas (GHG) emissions are outlined in Assembly Bill 32 (signed into law 2006), 2005 Executive Order and a 2004 ARB regulation to reduce passenger car GHG emissions.
- These efforts aim at reducing GHG emissions to 1990 levels by 2020 - a reduction of approximately 30 percent, and then an 80 percent reduction below 1990 levels by 2050.



■ Western Climate Initiative

- The Western Climate Initiative, launched in February 2007, is a collaboration of seven U.S. governors and four Canadian Premiers.
- WCI was created to identify, evaluate, and implement collective and cooperative ways to reduce greenhouse gases in the region, focusing on a market-based cap-and-trade system.

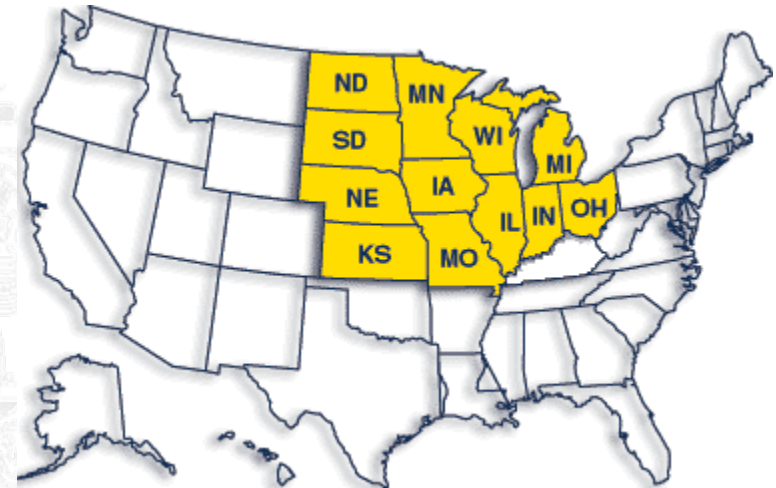


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■ Mid-West GHG Accord

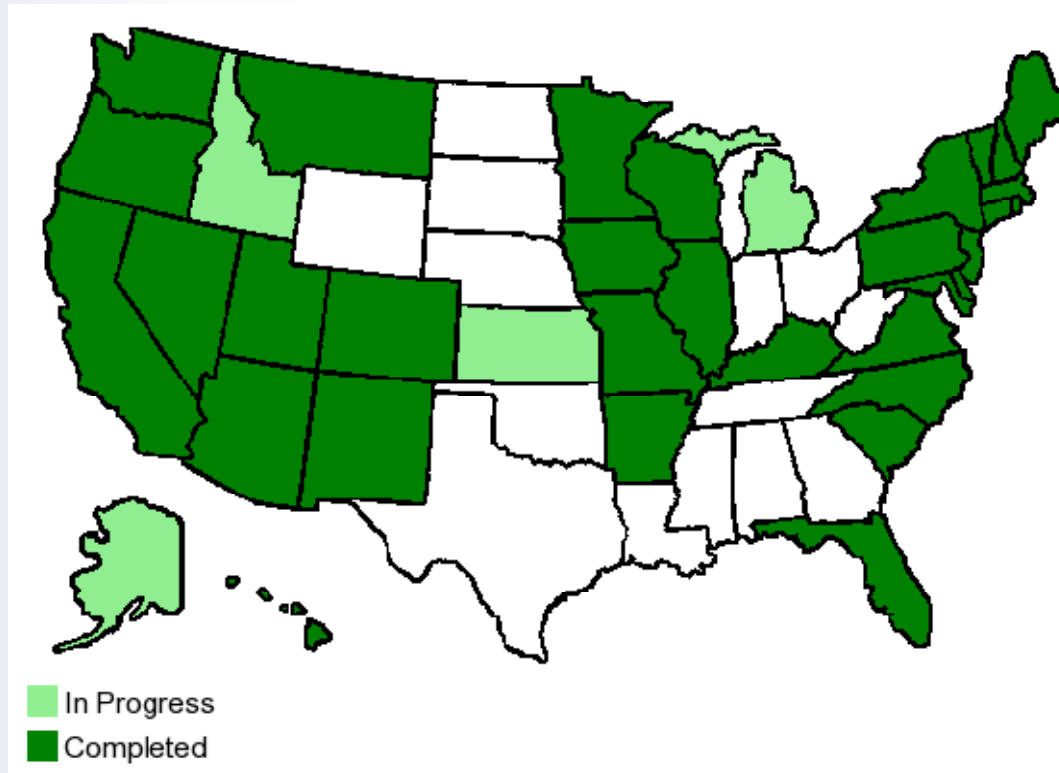
- 10 Mid-western states
 - Indiana, Ohio, and South Dakota are signing the agreement as observers to participate in the formation of the regional cap-and-trade system.
- The Accord will:
 - Establish greenhouse gas reduction targets and timeframes consistent with MGA member states' targets;
 - Develop a market-based and multi-sector cap-and-trade mechanism to help achieve those reduction targets;
 - Establish a system to enable tracking, management, and crediting for entities that reduce greenhouse gas emissions; and
 - Develop and implement additional steps as needed to achieve the reduction targets, such as a low-carbon fuel standards and regional incentives and funding mechanisms.



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State Climate Action Plans



Source: http://www.pewclimate.org/what_s_being_done/in_the_states/action_plan_map.cfm



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NEW ENERGY FOR AMERICA



My presidency will mark a new chapter in America's leadership on climate change that will strengthen our security and create millions of new jobs in the process.

That will start with a federal cap-and-trade system.

We'll establish strong annual targets that set us on a course to reduce emissions to their 1990 levels by 2020, and reduce them an additional 80% by 2050.

Further, we'll invest \$15 billion each year to catalyze private-sector efforts to build a clean-energy future.



Barack Obama.

Photo: [David Katz/Obama for America](#)



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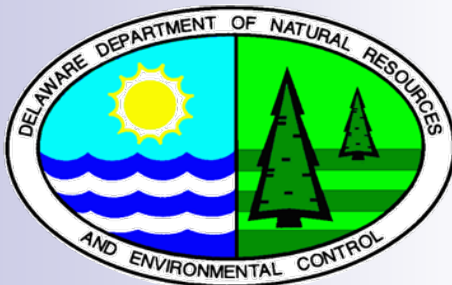
Questions?



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