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# Key Lessons from the Regional Greenhouse Gas Initiative

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# The RGGI Model

- “We did it with SO<sub>2</sub>; let’s do it with CO<sub>2</sub>”
- But...
- Auction, rather than freely-allocate, allowances (opportunity cost)
- Rely on a modest price on carbon
- Recycle revenues
- State members have flexibility to invest revenues
- Model end-use energy efficiency and support existing clean policies that are already successful

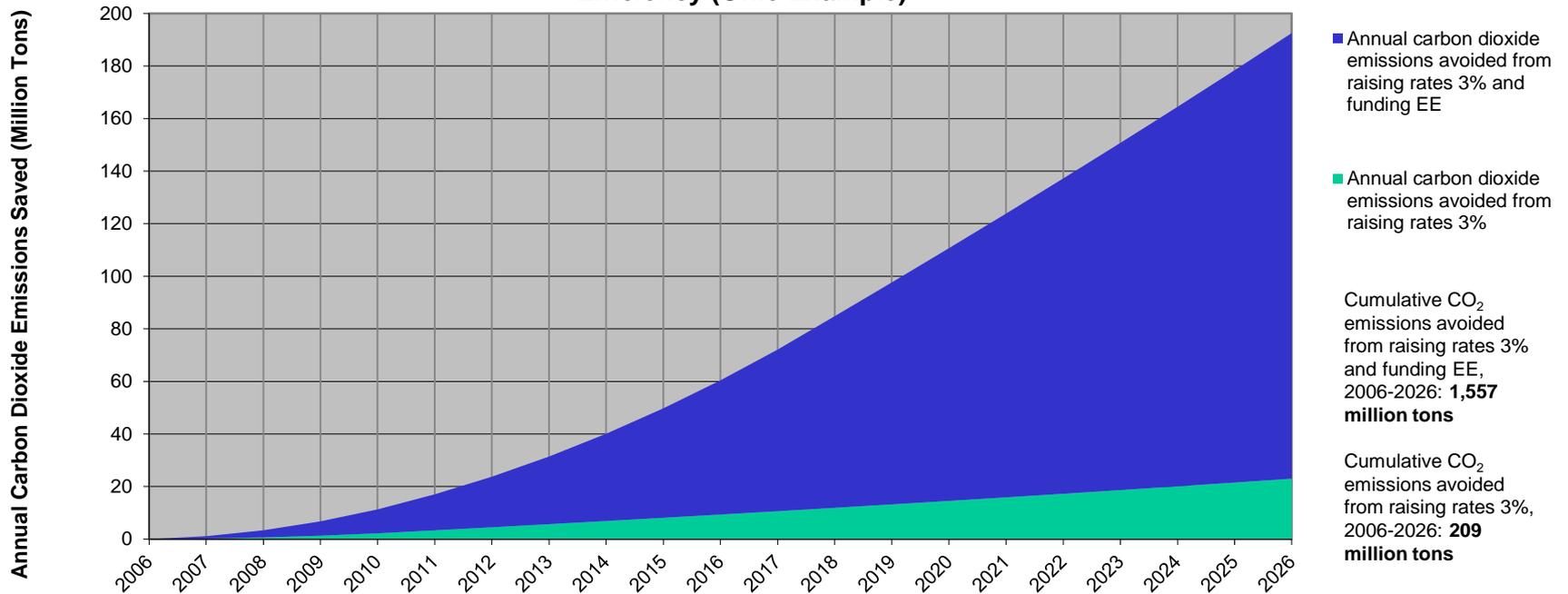
# Background: Reducing Electric Sector Emissions

Regardless of policy choices, power-sector CO<sub>2</sub> emissions can be significantly reduced in three ways:

- Reducing consumption (EE);
- Re-dispatching the existing fleet; and
- Lowering the emissions profile of new generation (including repowering existing generation).

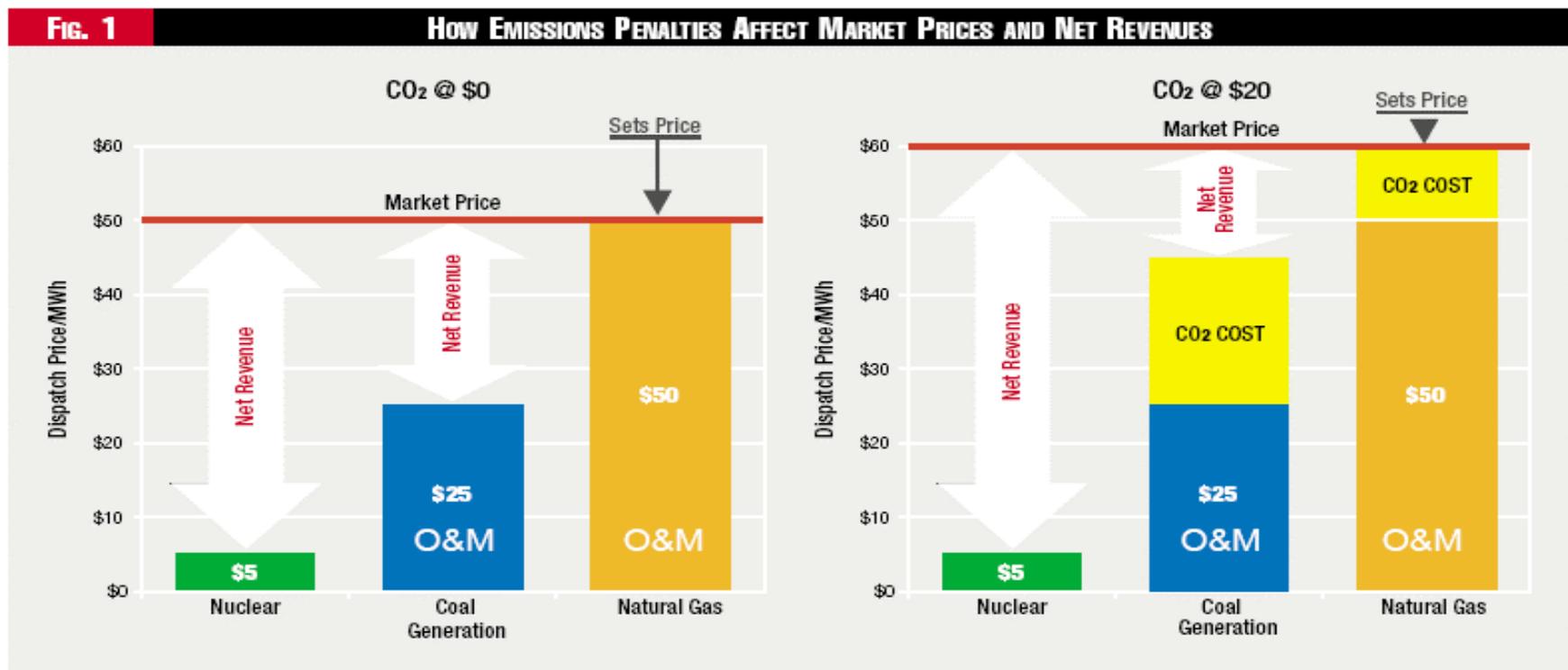
# Efficiency programs can save 7x more carbon per consumer \$ than carbon taxes or prices

### Annual CO<sub>2</sub> Emissions Saved by: Increasing Rates 3%; and Increasing Rates 3% to Fund Energy Efficiency (Ohio Example)



Assumptions: Electricity use increases by 1.7% per year; Retail electric sales increase by 3%; Price elasticity is -0.25 (-0.75 for a 3% increase), distributed over 5 years; Carbon dioxide emissions are 0.915 tons per MWh in Ohio; Cost of EE is 3 cents per kWh; Average EE measure life is 12 years

# How Emission Charges Can Raise Prices Without Changing Dispatch or Emissions Source



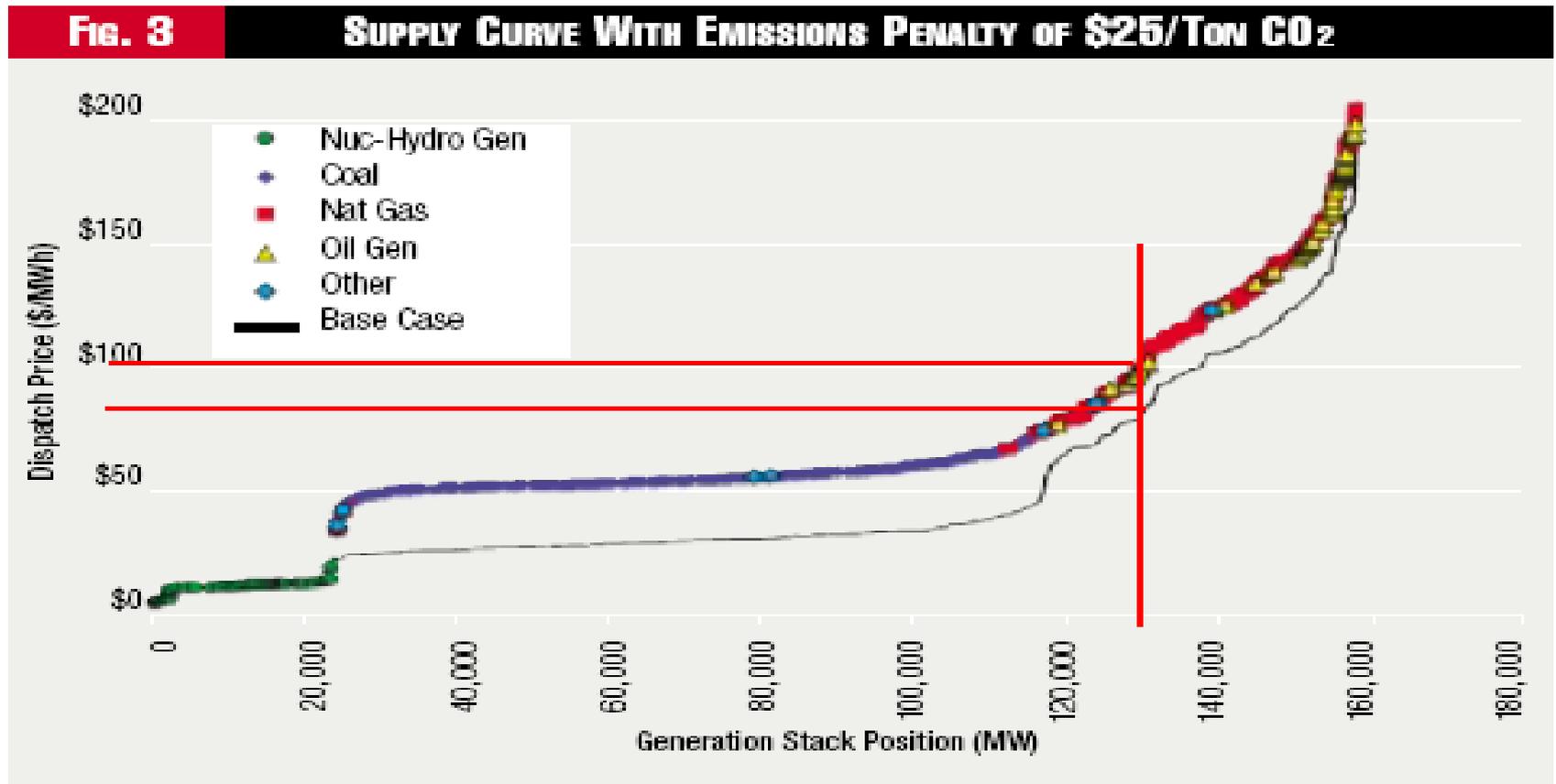
Emissions Source: "The Change in Profit Climate" --Public Utilities Fortnightly May 2007 --Victor Niemeyer, EPRI

# Gen-side carbon costs can increase wholesale power prices with little effect on dispatch & emissions— Modeling results elsewhere in the US ECAR-MAIN and ERCOT

- In ECAR-MAIN (Upper Midwest, coal-heavy) a carbon charge of \$25/ton would raise wholesale power prices \$21/MWH.
  - “Even a CO<sub>2</sub> value of \$50/ton would produce only a 4% reduction in regional emissions given the current generation mix.
- In ERCOT (Texas, gas-heavy) “when gas is selling for around \$8MMbtu, even a CO<sub>2</sub> value of \$40/ton produces little emissions reduction” from the existing mix.
- Thus, the most important tools to reduce emissions are new long-term investments.

*Source: “The Change in Profit Climate: How will carbon-emissions policies affect the generation fleet?”  
Victor Niemeyer, (EPRI) --Public Utilities Fortnightly, May 2007*

# Auction or carbon tax to sources can increase wholesale power prices with little effect on dispatch or emissions



“The Change in Profit Climate: How will carbon-emissions policies affect the generation fleet?”

Victor Niemeyer, (EPRI), Public Utilities Fortnightly May 2007 (some captions, demand and price lines added)

# Two Keys To Understanding RGGI:

## (1) Price Effect and (2) Flexibility

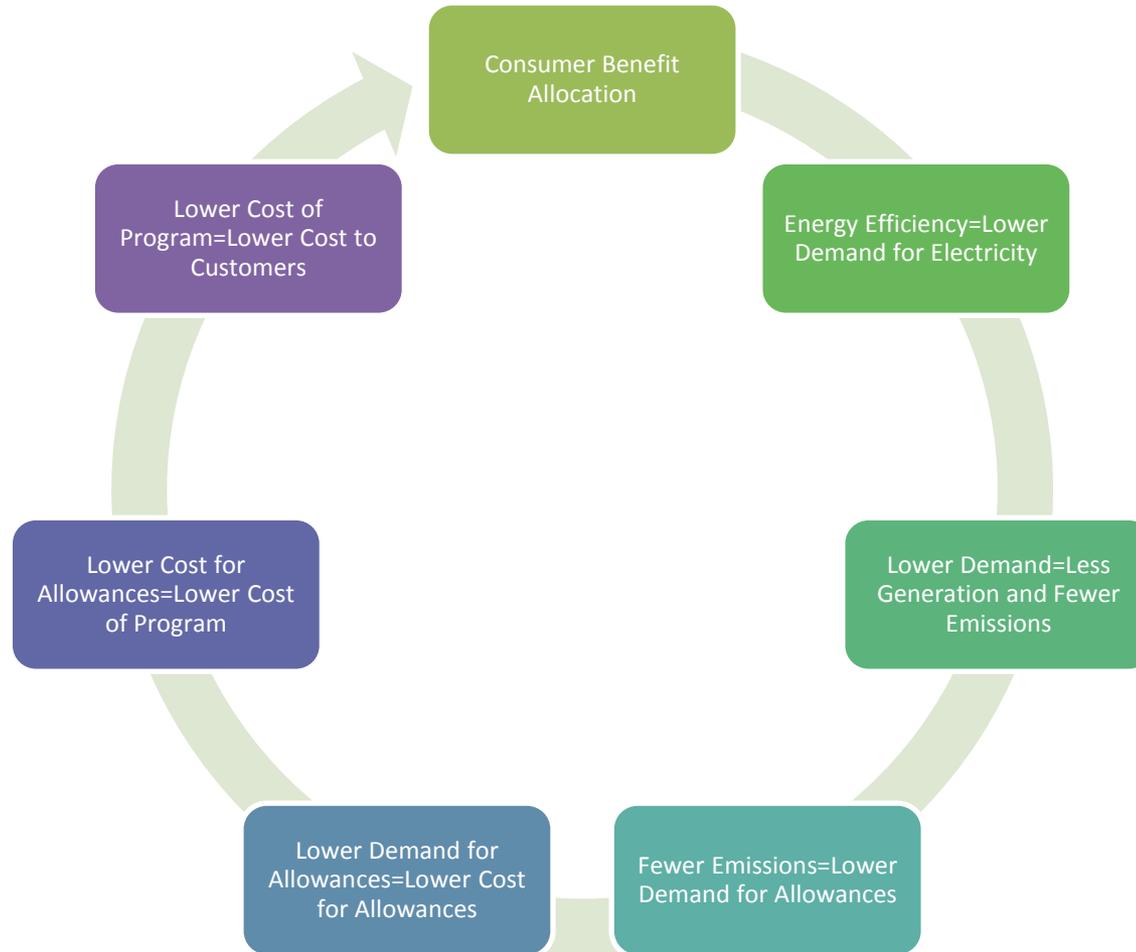
1. The **price effect** of a cap on CO<sub>2</sub> emissions is **not paramount** to the success of the program.
  - RGGI's allowance prices have never exceeded \$3.51 per ton and currently trade at \$1.89 per ton.
  - Instead, it is the **reinvestment** of the **proceeds** from **allowance sales into existing state programs (especially end-use energy efficiency)** that have reaped the greatest program benefits.
2. **Each state has** its own energy **challenges**, and sectoral **policies**; there is **no single solution**.
  - RGGI members have agreed, subject to the *25% consumer benefit allocation*, that each state should have the discretion to spend its share of allowance revenues as it sees fit.

# RGGI Asked, “What happens if we double efficiency spending in RGGI?”

- Modeling\* for RGGI found:
  - Carbon credit prices drop 25%
  - Need for new fossil capacity drops 33%
  - Customer bills actually drop 5%(Industrial) to 12%(Residential)
  - And –even greater EE investments (quite attainable) would yield greater savings

\*IPM model runs by ICF Consulting using EE portfolios developed by ACEEE

# Effects of Efficiency Investment in a Carbon Cap-and-Trade Program



# Examples of how States Auction Allowances and use Revenues

- **Maine:**
  - Auctions 88%, freely allocates 10% CHP, 2% set-aside for voluntary clean energy
  - Revenues: approx. 85% electric energy efficiency (EE), 5% all-fuels EE (e.g., propane, heating oil)
- **New Hampshire:**
  - Auctions minimum 69%
  - Revenues: 90% EE, 10% low-income EE
- **Vermont:**
  - Auctions 99%, allocates 1% set-aside for voluntary clean energy
  - Revenues: approx. 95% all-fuels EE

# Put Cap-and-Trade in Context

- Along with other tools in the tool box, cap-and-trade can promote cleaner energy development and contribute to successful carbon management:
  - Efficiency programs,
  - Renewable Portfolio Standards, Feed-in Tariffs,
  - Integrated resource management (utility planning that includes externalities like a price for carbon),
  - Maybe new clean or cleaner capacity like Carbon Capture and Storage, and
  - Customer-owned distributed generation.

# For More Information

- **Regional Greenhouse Gas Initiative: an initiative of the Northeast and Mid-Atlantic States of the U.S.** <http://www.rggi.org/>
- **Carbon Caps and Efficiency Resources: How Climate Legislation Can Mobilize Efficiency and Lower the Cost of Greenhouse Gas Emission Reduction**, Cowart (Vermont Law Review 2008 ) <http://lawreview.vermontlaw.edu/articles/12%20Cowart%20Book%202,%20Vol%2033.pdf>
- **Climate Issue Brief #4, State Clean Energy Policies: The Foundation for an Electric Sector Cap-and-Trade Program**, National Association of Regulatory Utility Commissioners, [http://www.naruc.org/Publications/ClimateIssueBrief4\\_Jul2009.pdf](http://www.naruc.org/Publications/ClimateIssueBrief4_Jul2009.pdf)
- **Images and How We Remember History**, Farnsworth <http://www.huffingtonpost.com/david-farnsworth/images-and-how-we-remember-b-604784.html>
- **Climate Policy and Affordability: Advocacy Opportunities in the Northeast**, Farnsworth, D'Antonio , and Pike-Biegunska [http://www.raonline.org/docs/RAP\\_Farnsworth\\_ClimatePolicyinNortheast\\_2009\\_09\\_18.pdf](http://www.raonline.org/docs/RAP_Farnsworth_ClimatePolicyinNortheast_2009_09_18.pdf)
- **RGGI Allowance Allocations & Auction Proceeds Distribution Plans**, December 3, 2010, Environment Northeast, [http://www.env-ne.org/public/resources/pdf/ENE\\_Auction\\_Tracker\\_110203.pdf](http://www.env-ne.org/public/resources/pdf/ENE_Auction_Tracker_110203.pdf)
- **Electricity Energy Efficiency Benefits of RGGI Proceeds: An Initial Analysis**, October 5, 2010, Chang, White, Johnston, and Bruce Biewald <http://www.synapse-energy.com/Downloads/SynapseReport.2010-10.RAP.EE-Benefits-of-RGGI-Proceeds.10-027.pdf>