Carbon Caps and Efficiency Resources

Carbon Revenue Recycling to Lower Costs and Accelerate Emission Reduction

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The Regulatory Assistance Project

RAP is a non-profit organization providing technical and policy assistance to government officials on energy and environmental issues. RAP is funded by US DOE & EPA, several foundations, and international agencies. We have worked in over 16 nations and more than 40 US states. In Europe we are working closely with the European Climate Foundation.

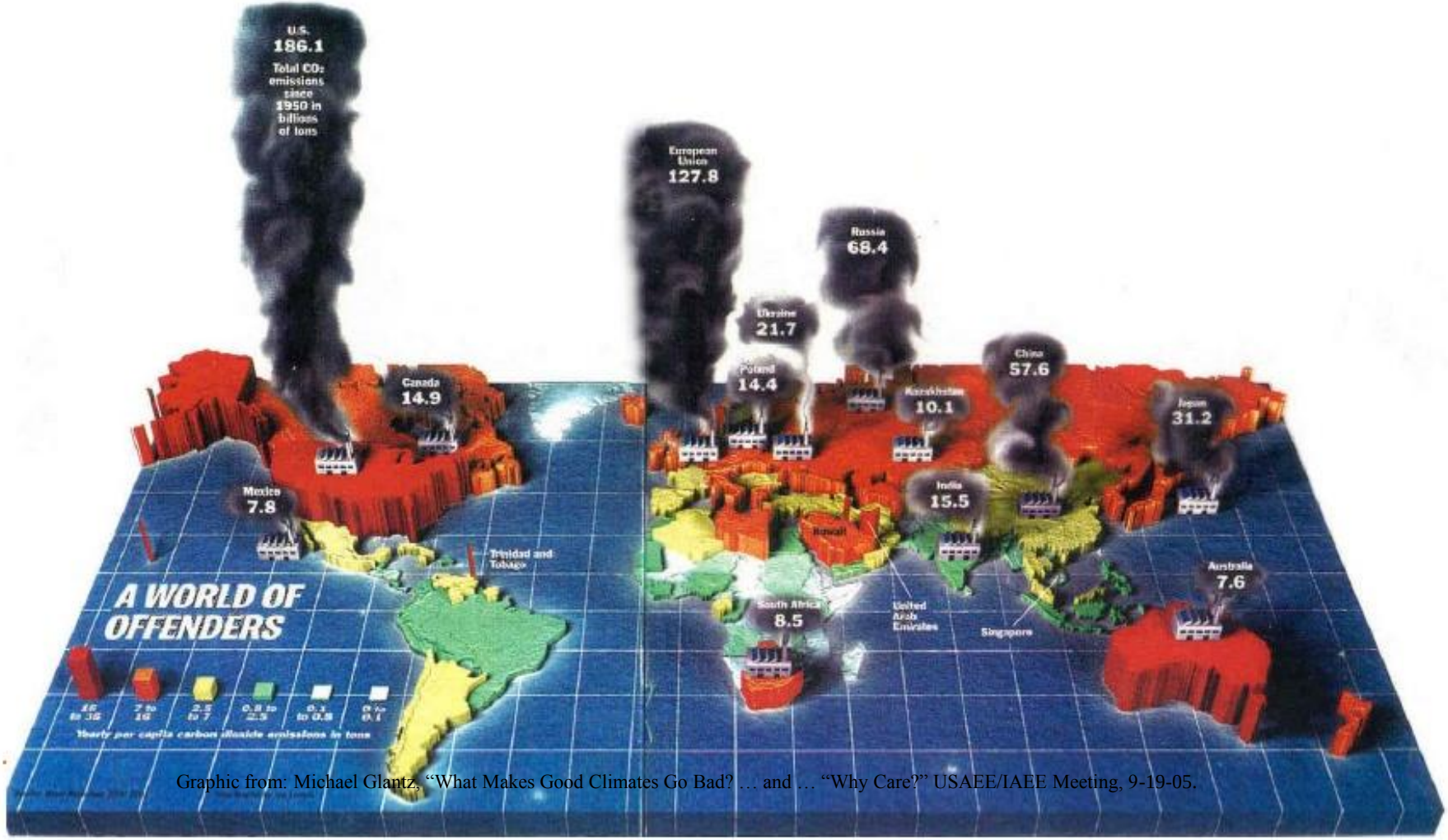
Richard Cowart is the Director of European Programs for RAP.

He was Chair of the Vermont PSB, Chair of the US regulators' national Energy & Environment Committee, and of the National Council on Competition and the Electric Industry.

Recent assignments include work as a technical advisor to the leading GHG cap-and-trade designs in the US, including RGGI, California, and the US Congress; and to the National Association of Clean Air Agencies, and to China's national energy and environmental agencies.

2 billion villagers want a better life

CO2 Emissions by Country: Total emissions since 1950 (b tons)



Graphic from: Michael Glantz, "What Makes Good Climates Go Bad? … and … "Why Care?" USAEE/IAEE Meeting, 9-19-05.

Overview

- “Top down” cap and trade relying on price alone is more expensive, less likely to succeed than a **portfolio-based policy menu** (plus a cap);
- **Public policies** (EE programs, codes, portfolio mgt, RES, etc.) are crucial to success;
- Allowance auction is not enough – **How we invest allowance revenues** is more powerful than the EUA price;
- **US Congress and EU governments should recycle carbon revenue for efficiency**.

Where will power sector reductions come from?

3 main possibilities:

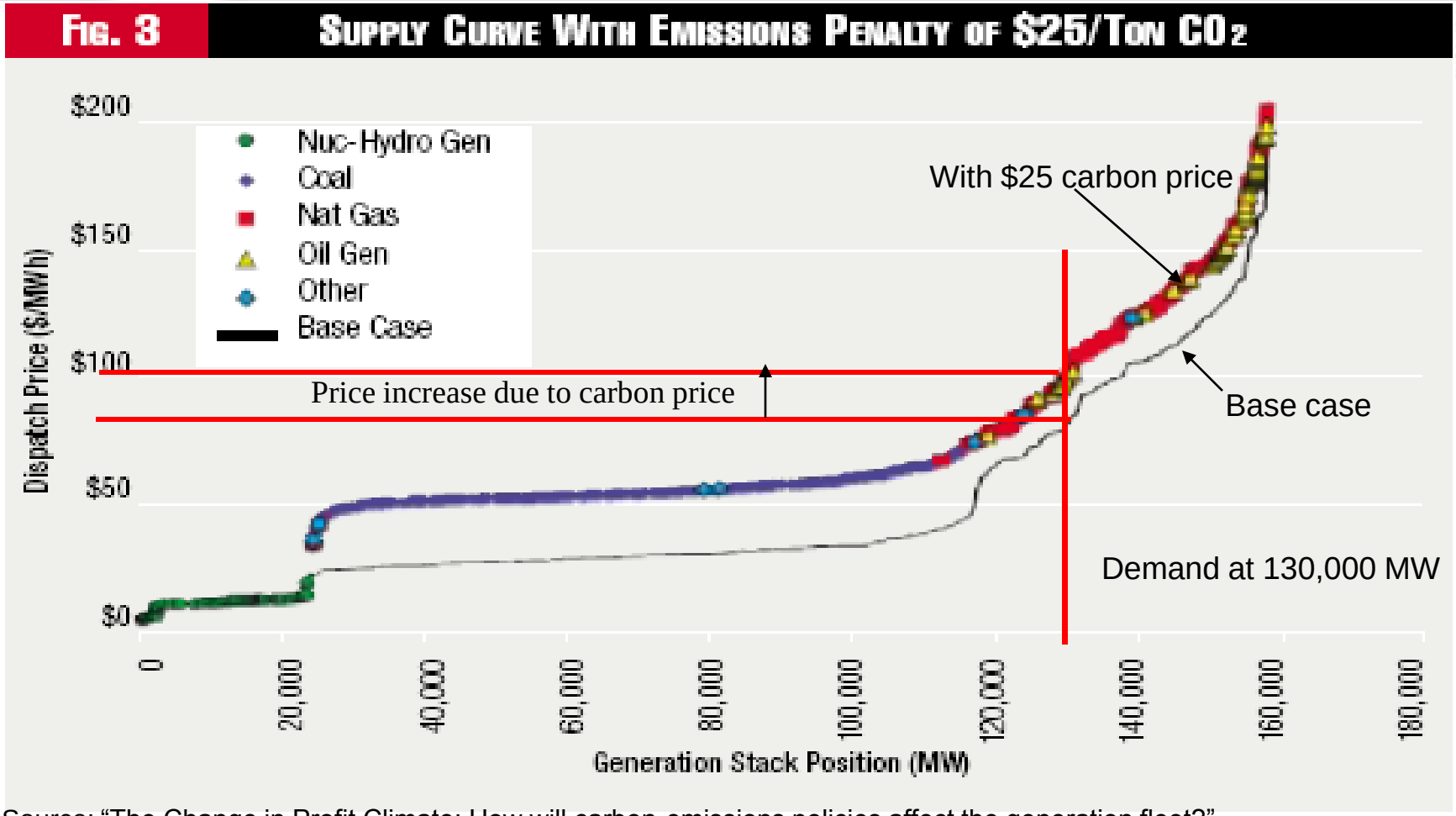
- Reduce consumption
- Re-dispatch the existing fleet
- Lower the emission profile of new generation (including repowering)

For each opportunity, ask:

1. **How many tons will it avoid?**
2. **How much will it cost consumers per ton ?**
3. **What tools – including what kind of carbon caps -- get the best results on #1 & #2 ?**

Problem #1: Hard to affect demand (enough) with carbon prices

Problem #2: **Carbon taxes and auctions** to sources can increase wholesale power prices with little effect on dispatch or emissions



Source: "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>

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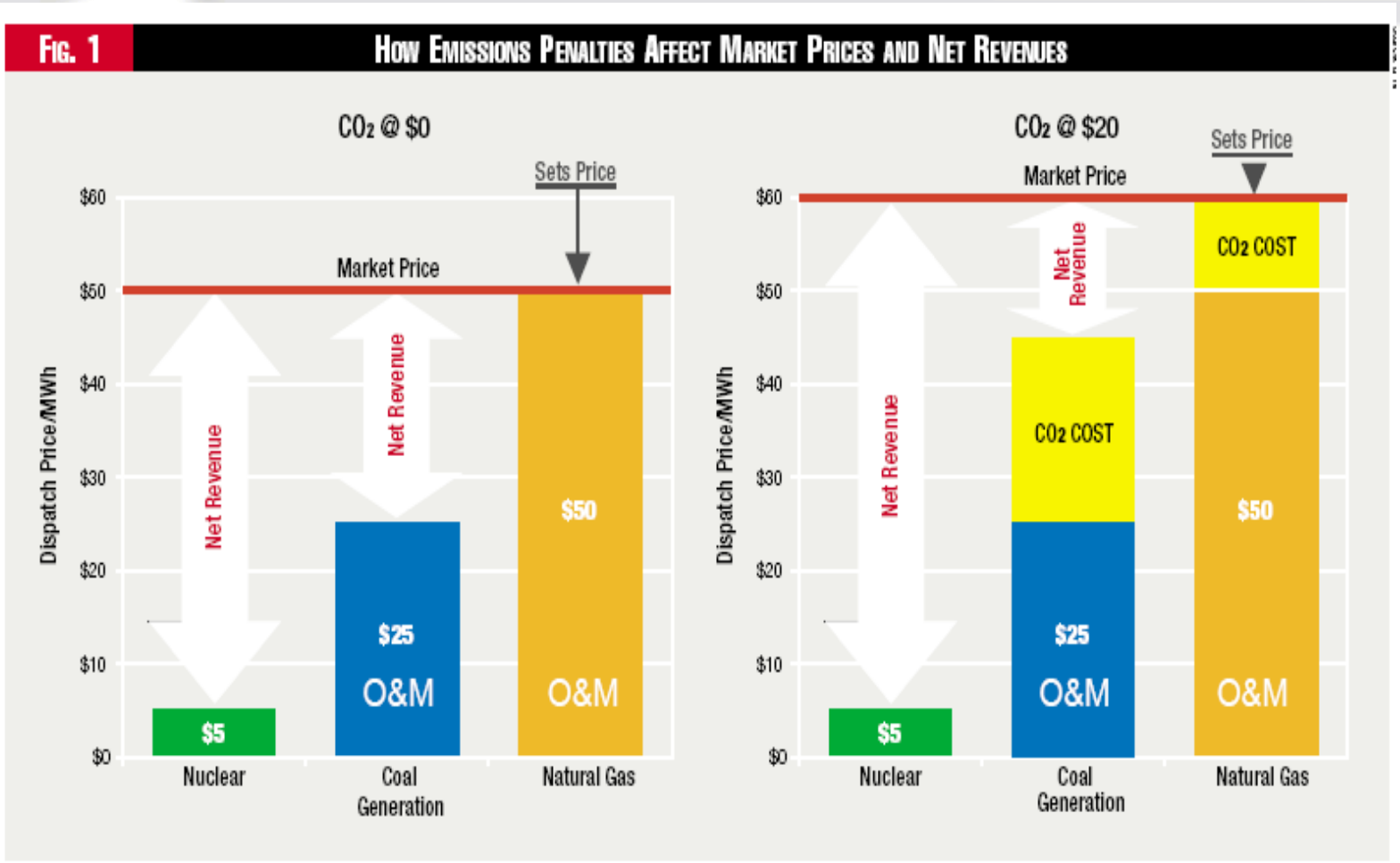
Why carbon taxes and auctions create “high cost tons”

- Carbon price must be very high to save many tons (for gas to displace coal, etc.)
- Fossil units almost always set the clearing price
- Short-term clearing price provides the benchmark for longer-term and bilateral contracts
- SO: Carbon penalty on sellers raises prices generally
- Inframarginal rent a/k/a “windfall gains” to generators paid for by consumers

How Emission Charges Can Raise Prices Without Changing Dispatch or Emissions

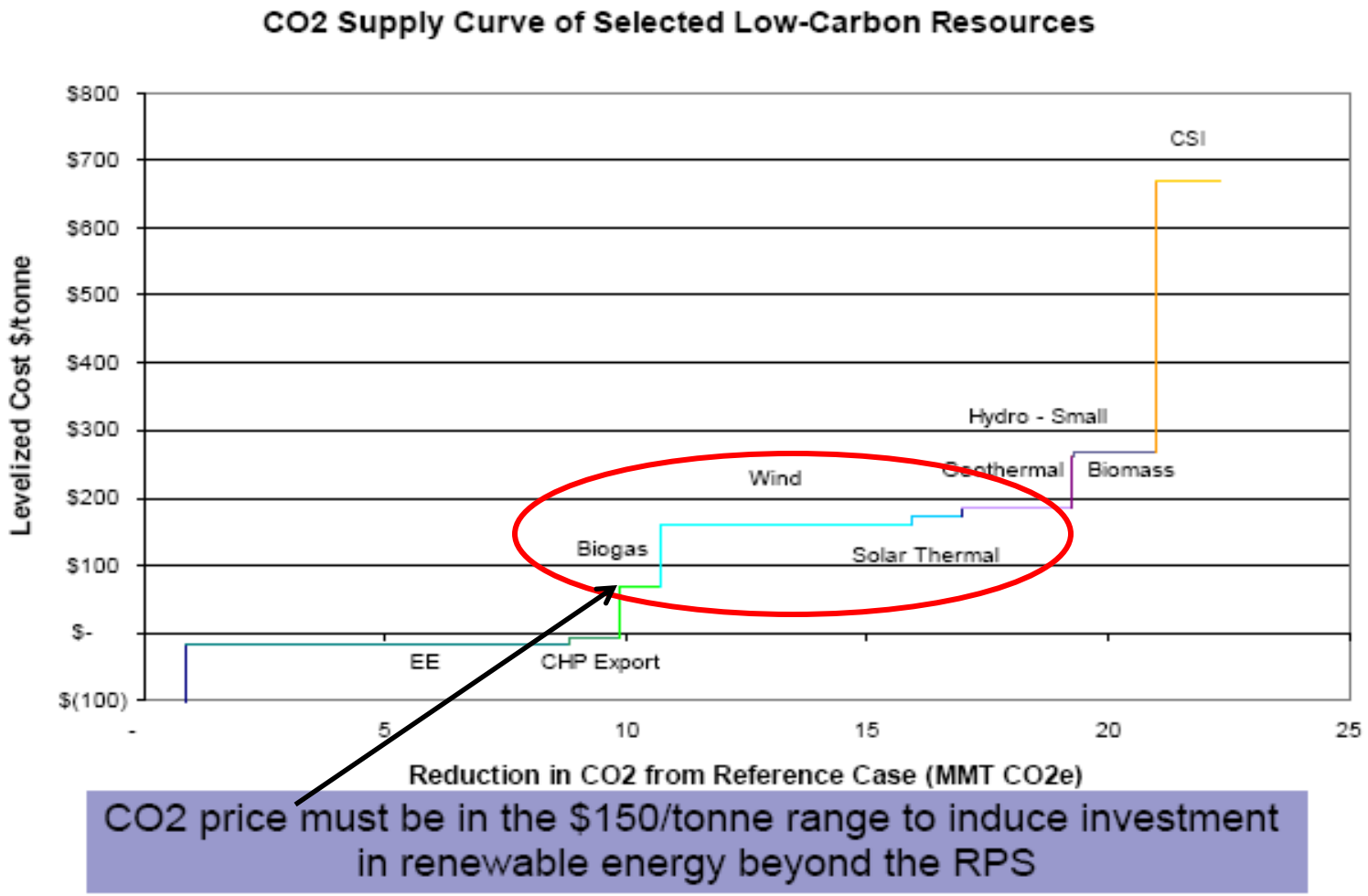


Source: "The Change in Profit Climate" -- Public Utilities Fortnightly May 2007 --Victor Niemeyer, EPRI

Problem #3: The consumer cost of clean generation

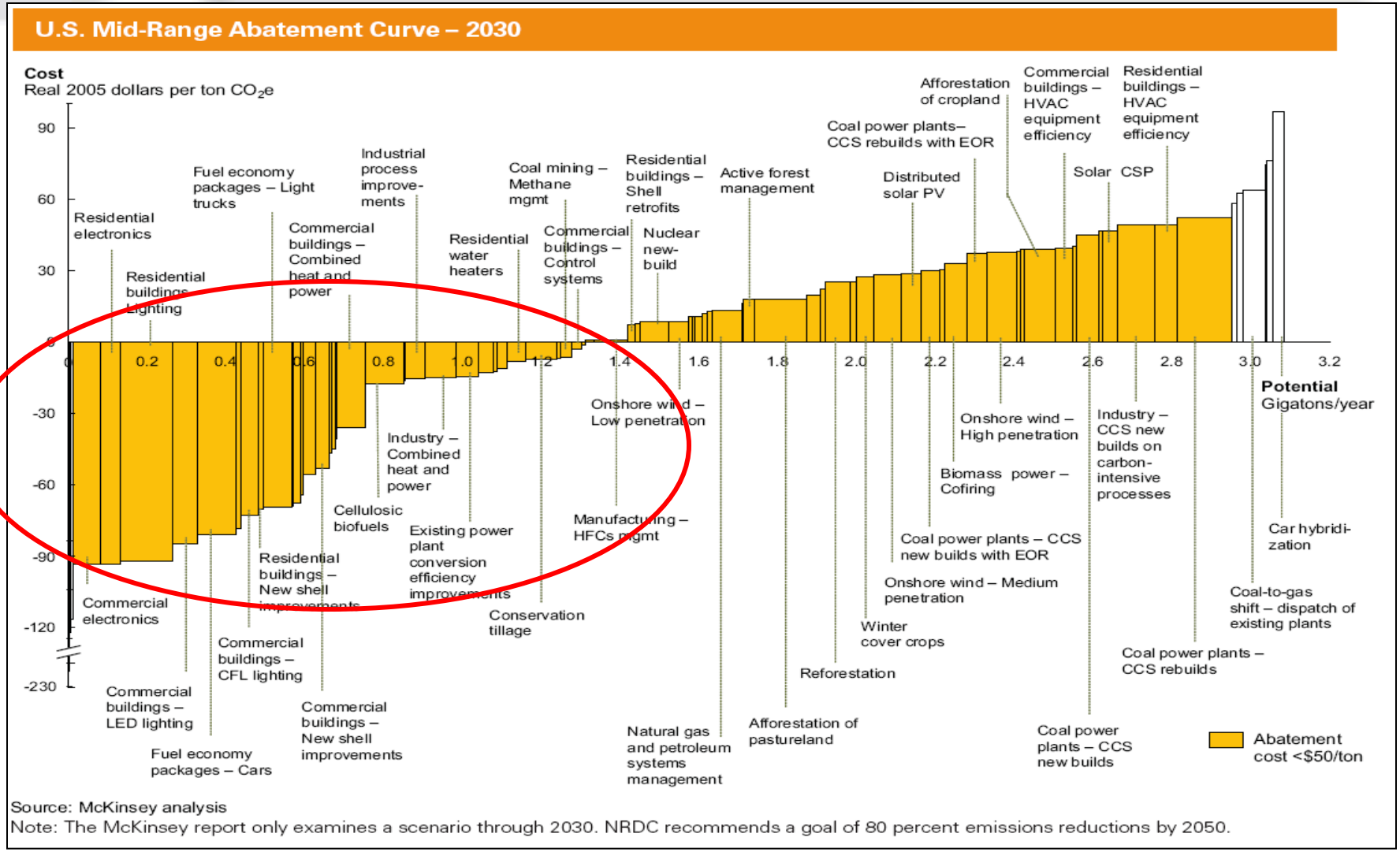
- How high must the carbon penalty be to drive replacement of coal/gas with wind/solar, on market prices alone?
- Counter-example: With the RPS, consumers pay just for the incremental cost of new RE -- without also paying increased costs for the existing fleet of coal, gas, and nuclear.
- Good news: *Most of RGGI states' and CA GHG savings will actually come from EE and RPS policies, not cap-and trade price effects.*

Implied carbon price for new low-carbon capital investment



Source: E3 analysis for California PUC, assumes RPS in effect

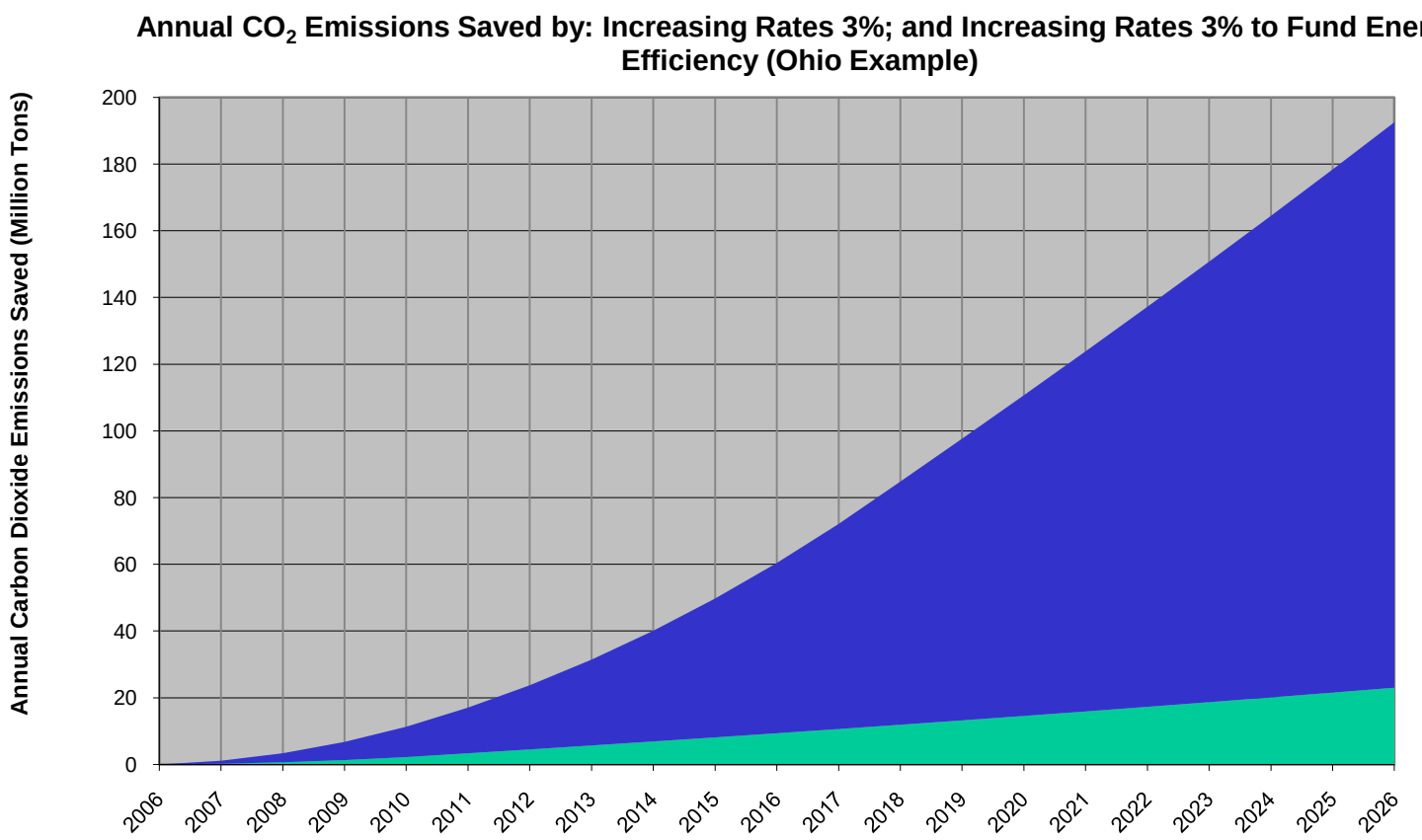
Response #1: Efficiency is the low-cost "carbon scrubber"



Source: McKinsey analysis

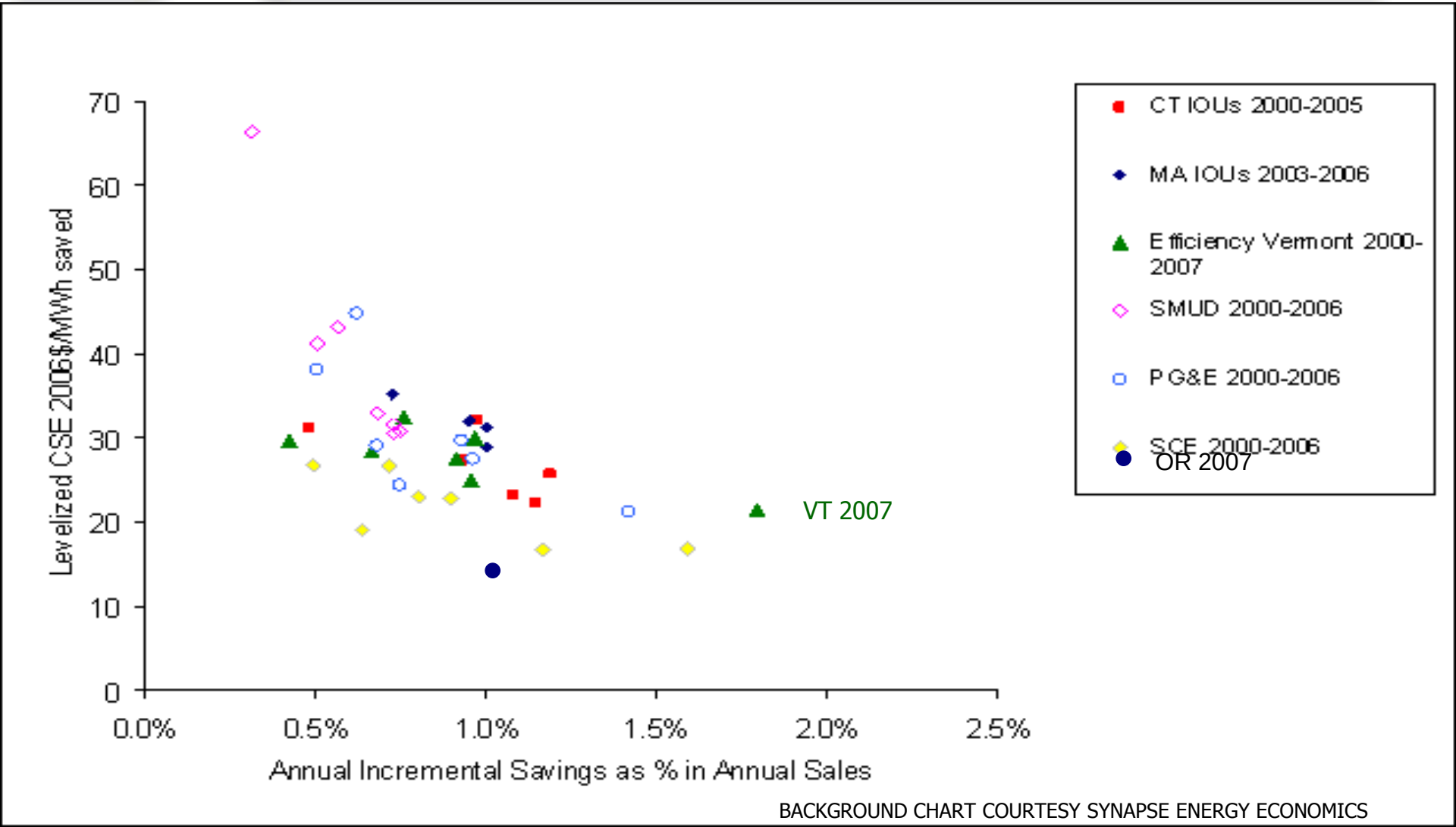
Note: The McKinsey report only examines a scenario through 2030. NRDC recommends a goal of 80 percent emissions reductions by 2050.

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



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

Cost and Savings Performance – Ambitious programs can cost less per MWH saved



BACKGROUND CHART COURTESY SYNAPSE ENERGY ECONOMICS

Main idea: Design GHG cap-and-trade for efficiency: The "Revenue Recycling" strategy

- Allocate up to100% of initial credits to consumer trustees (eg, distribution utilities, Weatherization and other EE programs) Generators need to purchase allowances, recycling much windfall revenue BACK to consumers

- Energy regulators/government supervise use of the money to benefit consumers
- **Best result: focus these $ on investments that lower carbon (EE, RE, and CCS)**
- Results: lower cost per ton avoided, lighter macro-economic impact >> quicker progress in reducing GHG emissions

Success Story on Revenue Recycling: The Regional Greenhouse Gas Initiative (RGGI)

- **Regional cap on power sector GHG emissions**
- **Cap, reduce GHGs by 10% by 2018**
- **RGGI region: 10 Northeast states**
- **Population equal to Belgium, Sweden, Austria, Denmark, Switzerland, & Ireland**
- **State-by-state adoption 2007+**
- **Launch 2009 – 4th auction held recently**

RGGI links cap-and-trade with end-use efficiency

- **Modeling* for RGGI found, if EE spending were doubled:**
  - 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

- **Cap and invest success in RGGI states**
  - All 10 RGGI states will auction allowances
  - 90% of allowances to be auctioned,
  - ~80% of proceeds will go for EE and clean energy resources = > 70% for efficiency

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

Consumer allocation – statutory example

*"In order to provide the **maximum long-term benefit** to Vermont electric consumers, particularly benefits that will result from **accelerated and sustained investments in energy efficiency** and other low-cost, low-carbon [resources],*

*the public service board …shall allocate **100 percent** of [Vermont's] tradable power sector carbon credits **and the proceeds from the sale of those credits***

*through **allocation to one or more trustees** acting on behalf of consumers"*

--H.860 Vermont (enacted 2006)

So what does this mean for US federal legislation?

1. Focus on **"portfolio-up" policies** (e.g.,RPS & EEPS) not just "carbon price driven" policies for power sector GHG reduction.
2. To moderate generator windfalls and lower the cost-per-ton-avoided: **auction allowances** or allocate them to **distribution utilities** (i.e., to power buyers, not sellers).
3. Dedicate auction revenues to investments in **end-use efficiency**.
4. **Allocate allowances to states/LDCs** on a performance basis or a matching basis to support EE progress.

The same ideas apply to the EU ETS

US Congress is acting: Status of Waxman-Markey

- New Congress, New President, Leading bill
  - "American Clean Energy and Security Act" of 2009 (ACES)
- Essential elements:
  - Economy-wide cap-and-trade
  - Cap reduces emissions 17% below 2005 by 2020; 83% below by 2050
  - "Foundation" policies too: (RES 20% by 2020, appliance and lighting standards, building code upgrades, etc)
  - Global trading permitted
- Will it pass?
  - House – With compromises, passage likely this year
  - Senate – Passage ***possible*** next year

Allocations for efficiency in ACES bill

- **Efficiency measures – among the key advances in this bill** (compared to past bills)
- **All allowances**: 9.5% of allowances off the top for EE programs by states, cities
- **Power allowances** (~35% of total) go to electric LDCs – revenue ***could be*** recycled for EE)
- **Natural gas allowances** all go to gas LDCs, 1/3 must be spent on efficiency
- **Subtle points**: formula for allocations to LDCs will reward efficiency over time

Can We Create a Carbon Allocation for Efficiency in Europe ?

- **Goal:** Allocate a sizable pool of carbon allowances to utilities, LDCs, or efficiency agencies to promote end-use efficiency
- **Elements:**
  - If possible, allocate allowances pre-auction (not auction revenues post-Treasury) to consumer trustees
  - Focus on “whole buildings/all-fuels” approaches to capture the most emission reductions
  - Administration/delivery builds on local/national competencies
    - No single right way to do this
- **Can this be done in Europe? In Ireland?**
- **What are the benefits and options for Ireland?**
  - What steps are needed now?

For more information…

- *"Carbon Caps and Efficiency Resources: How Climate Legislation Can Mobilize Efficiency and Lower the Cost of Greenhouse Gas Emission Reduction" (Vermont Law Review 2008)*

- *"Who Slices the Pie in the Sky? What Role Should States Play in Allocating GHG Allowances and Distributing Carbon Auction Revenues?" (Issue brief for the National Association of Clean Air Agencies, January 2008)*

- *"Power System Carbon Caps: Portfolio-based Carbon Management" (NREL Carbon Analysis Forum November 2007)*

- *"Why Carbon Allocation Matters – Issues for Energy Regulators" (RGGI memo March 2005)*

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