

Climate Policies for Economic Growth: Mobilizing Energy Efficiency

Richard Cowart
Director, European Programs

**On the Road to Copenhagen -- EU and US as
Driving Forces**

Prague -- September 23, 2009



The Regulatory Assistance Project

China ♦ India ♦ European Union ♦ Latin America ♦ United States

Website: <http://www.raonline.org>



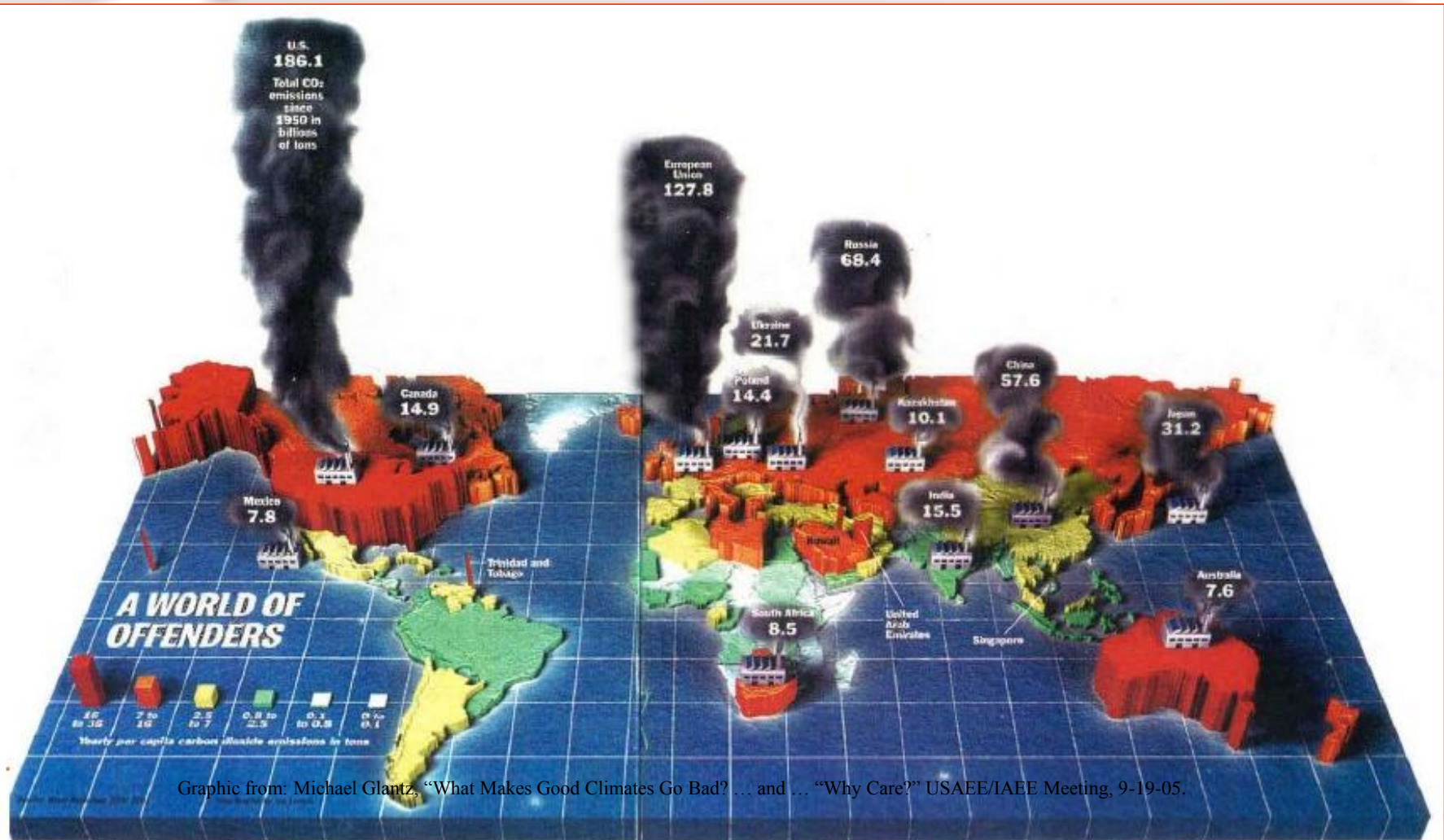
The Regulatory Assistance Project

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

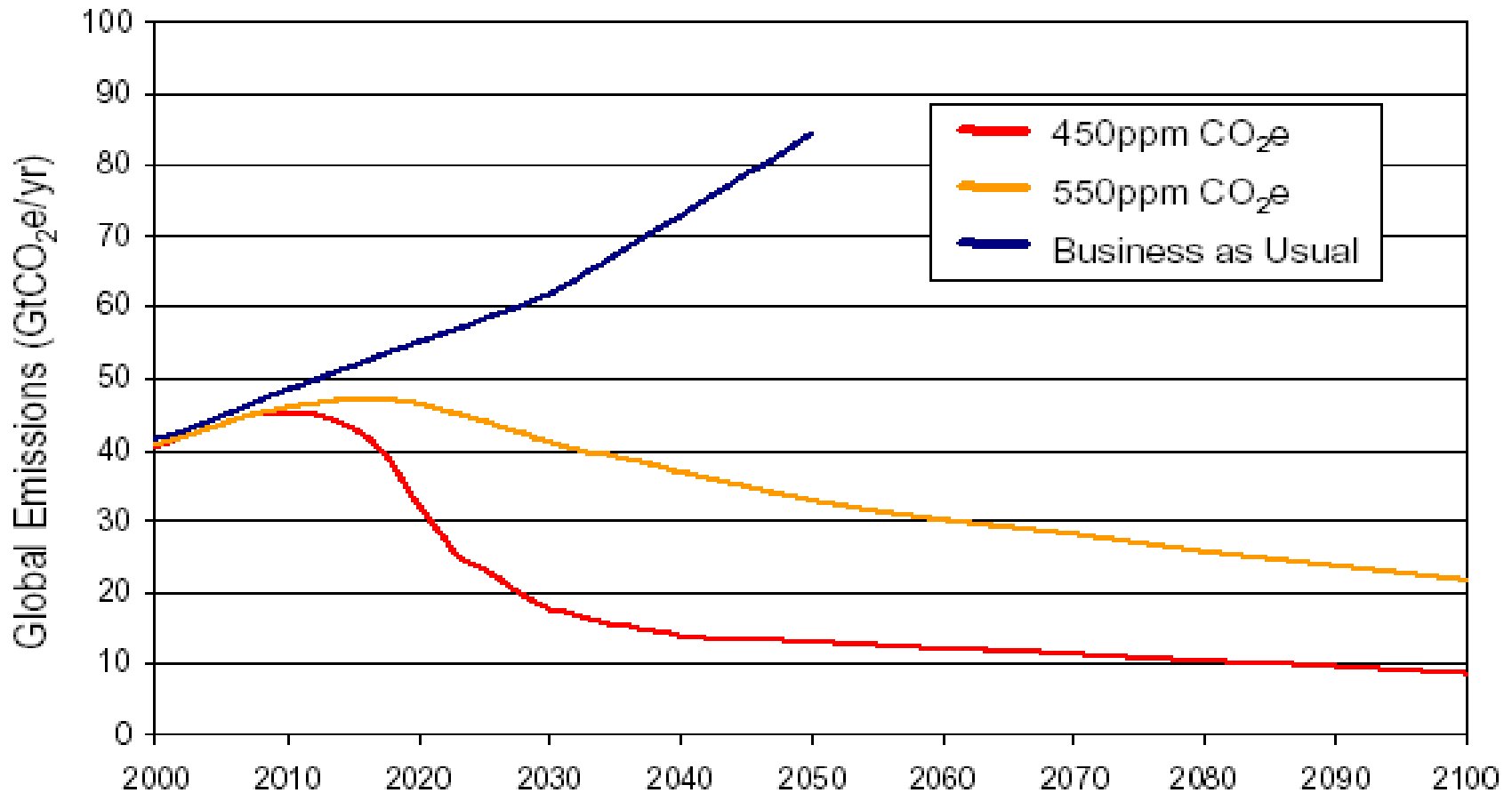
Richard Cowart is the **Director of European Programs** for RAP.

He was Chair of the Vermont PSB, Chair of NARUC's Energy & Environment Committee, and of the US National Council on Competition and the Electric Industry. Recent assignments include technical assistance to The UK Department of Energy and Climate Change, the US Congress, the Regional Greenhouse Gas Initiative (RGGI), the New York ISO, the California PUC, US energy and air regulators, and China's national energy and environmental agencies.

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



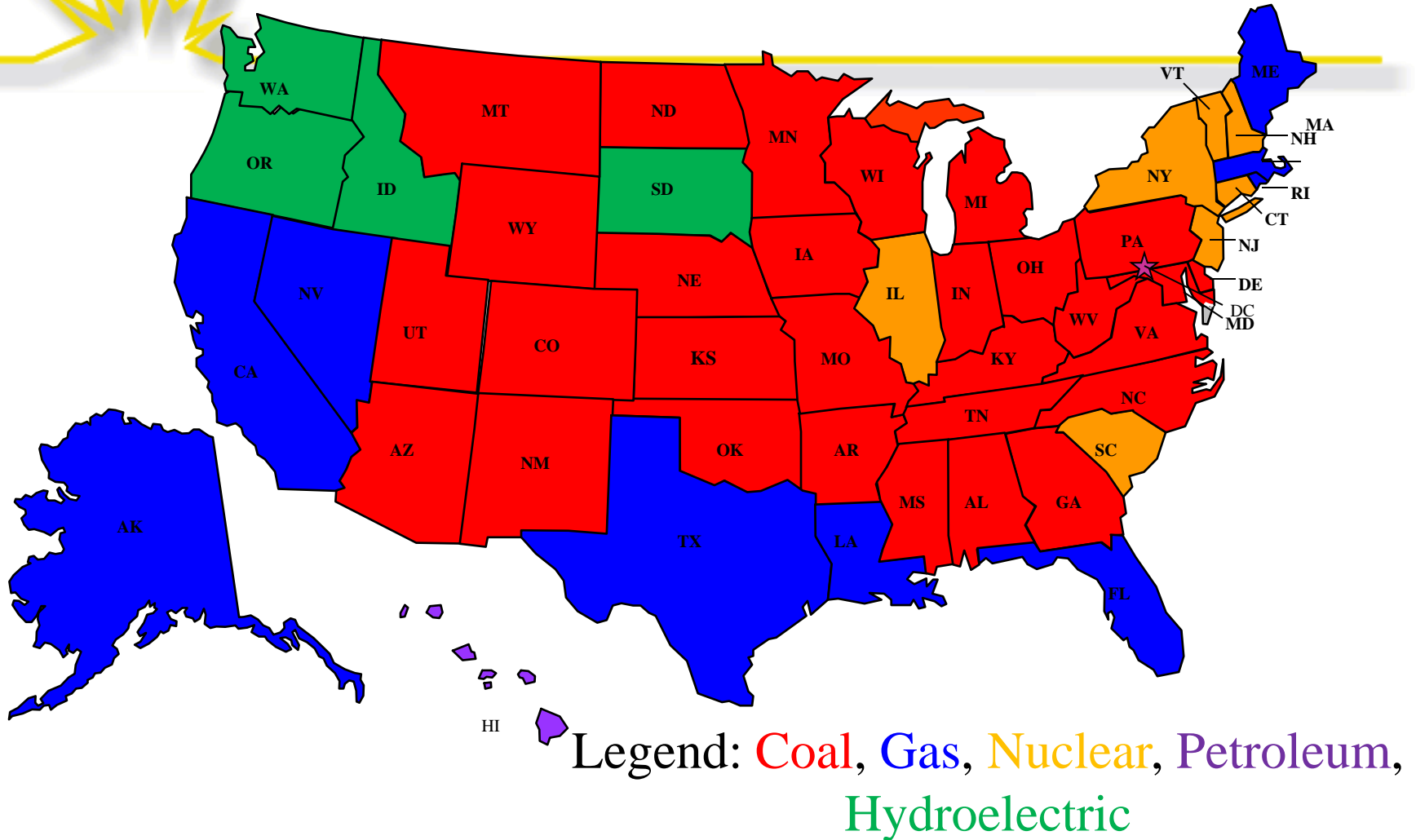
We can't stabilize without decarbonizing the power sector – how can we do that?



Source: Stern Review (UK) October 2006

Why Progress in Congress is So Difficult

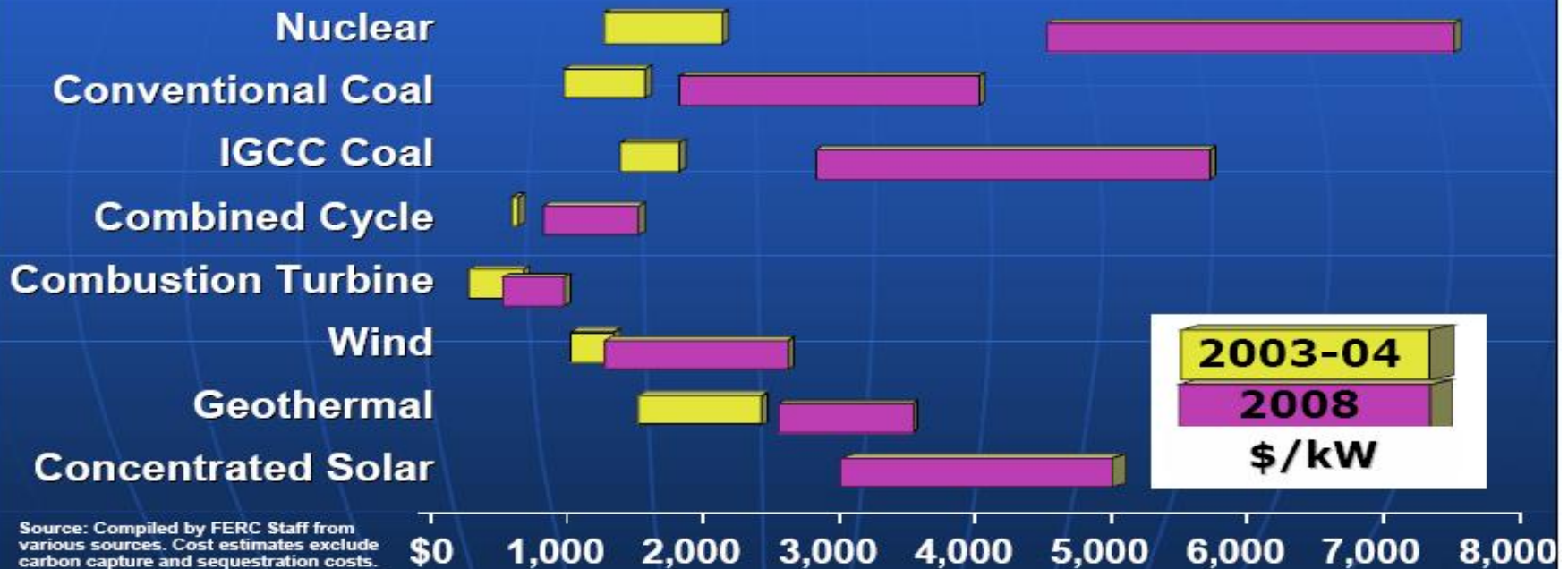
Primary Fuel for Electricity in US States



Source: Energy Information Administration, Selected Electric Industry Summary Statistics by State, 2006
www.eia.doe.gov

Supply-side options – growing financial risks

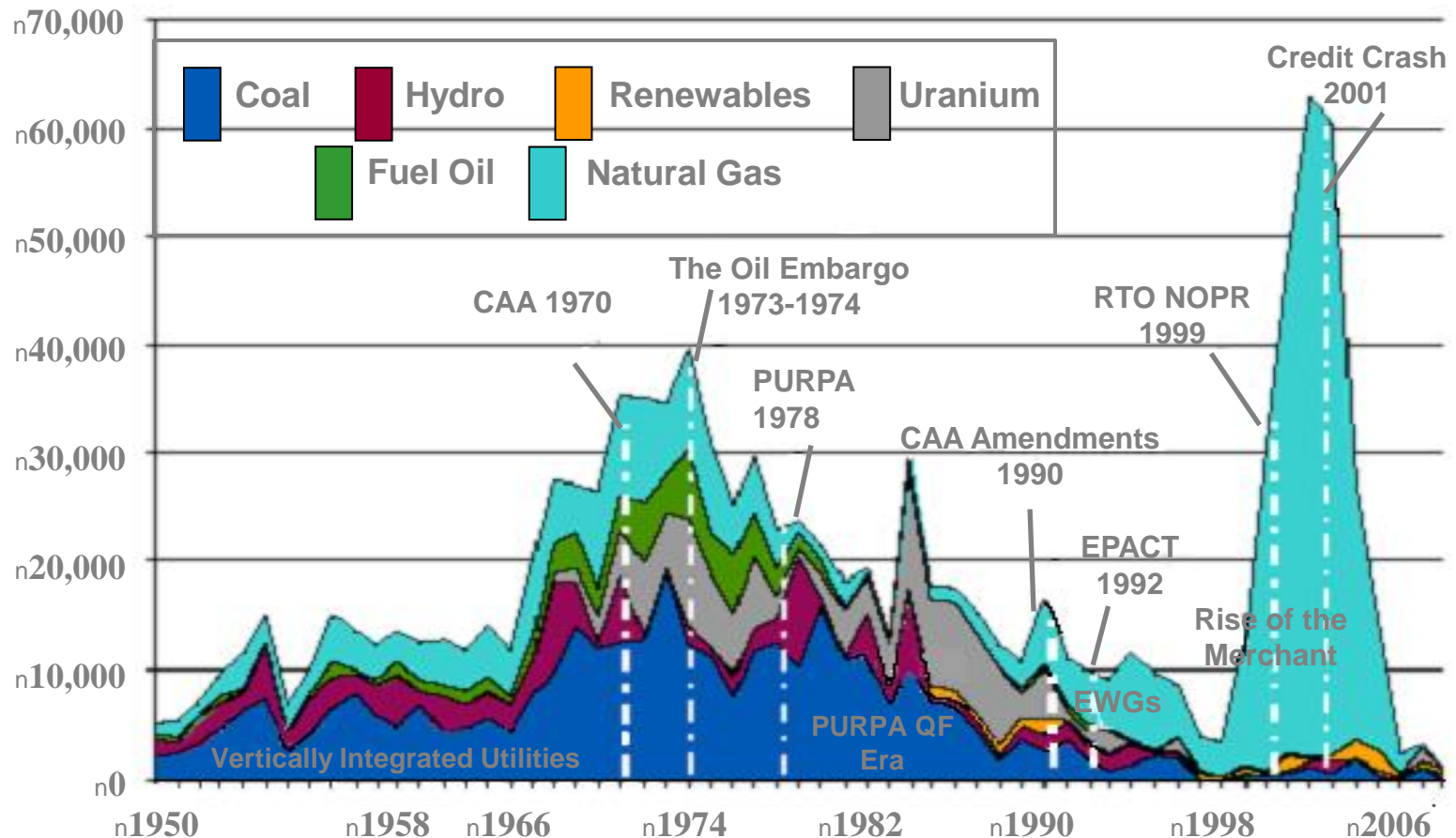
Estimated Cost of New Generation



More Gas? Price and Security Problems

US New Generation Capacity By Fuel Since 1950

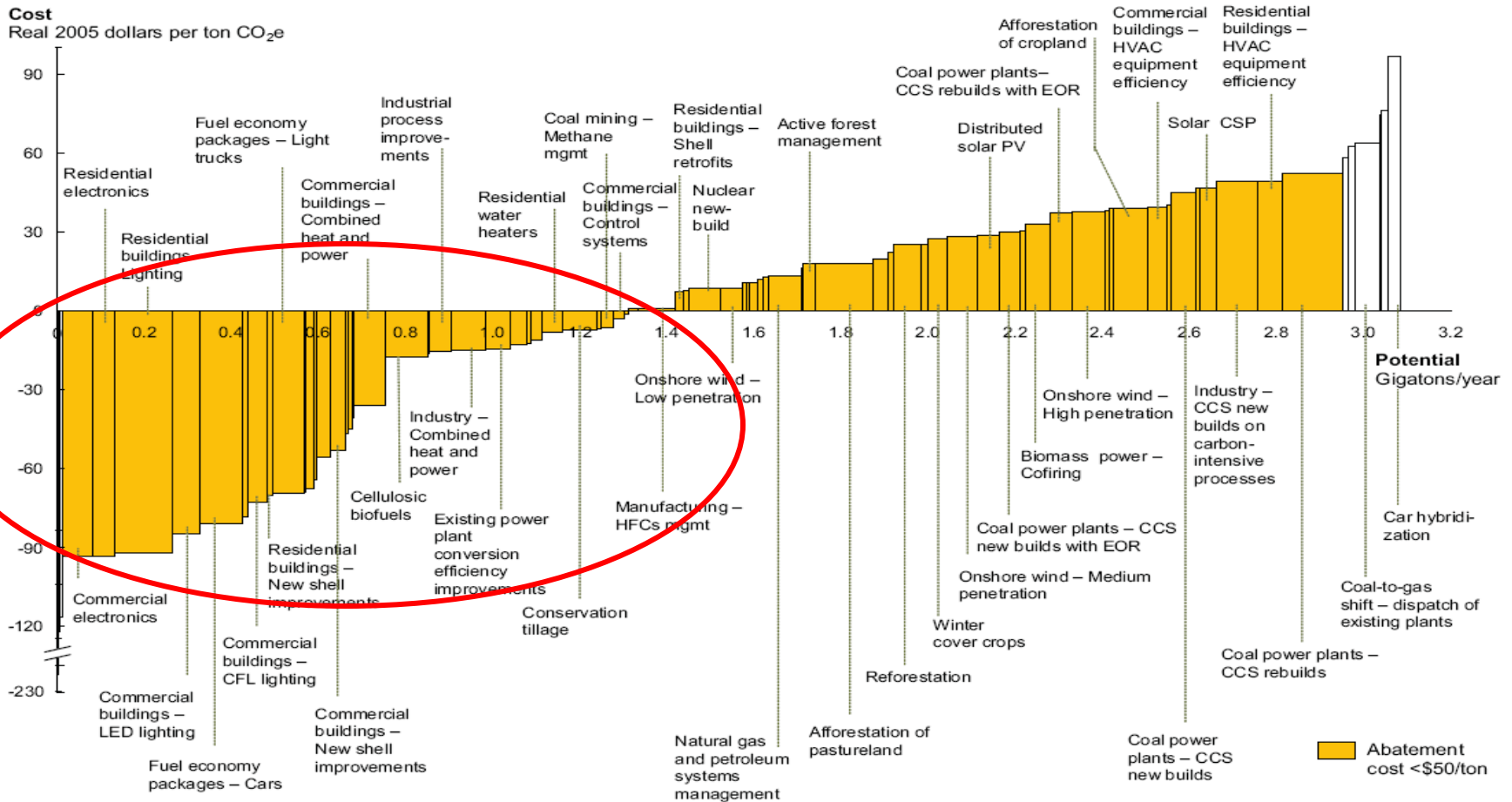
Capacity Installations (MW)



US EIA data

So, what can we do? Efficiency is the low-cost “carbon scrubber”

U.S. Mid-Range Abatement Curve – 2030

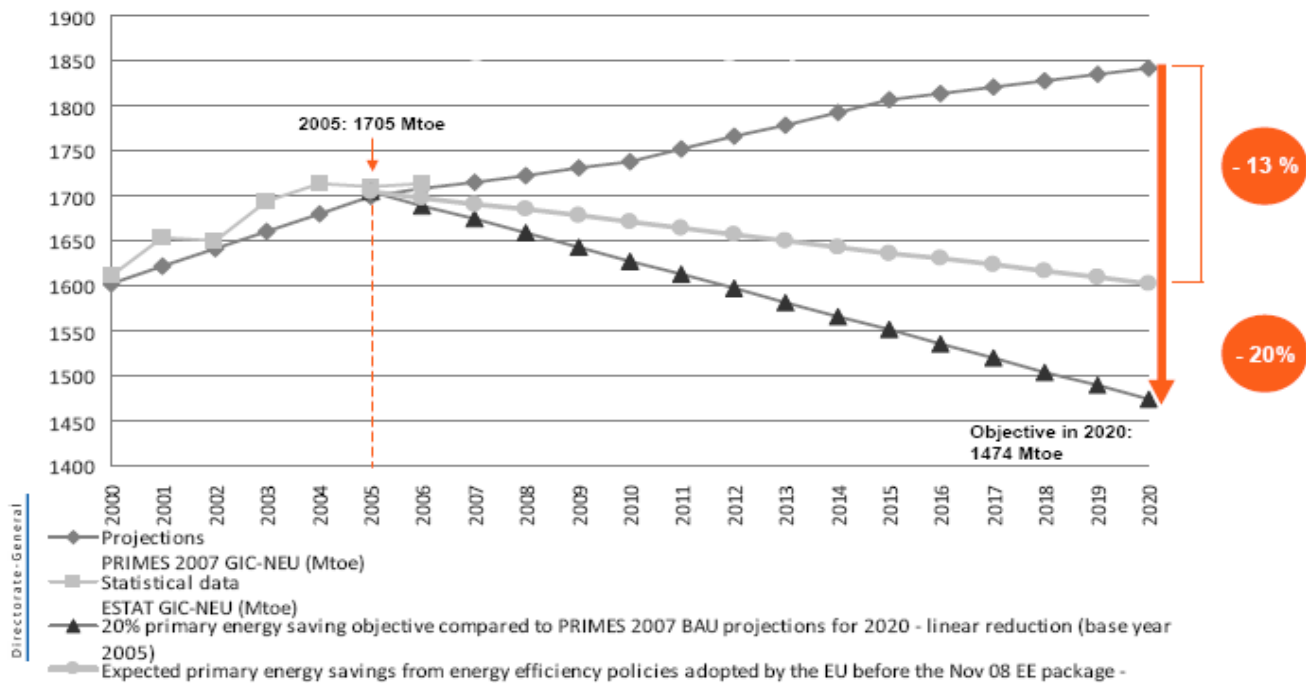


Source: McKinsey analysis

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

EU not on target to meet current EE goals

20% EU primary energy savings in 2020





An “Efficiency First” Power Policy

- **Large-scale energy efficiency delivers:**
 - ❖ Cost savings & productivity gains
 - ❖ Energy security and reliability
 - ❖ Climate gains
 - ❖ Political space and revenue to finance a global deal
- **Elements of a Utility-Scale Efficiency Strategy**
 1. **Recycle Carbon Revenue for Efficiency**
 2. **Obligations** -- Workable and enforceable Efficiency Obligations
 3. **Financing** – “Efficiency First” investments using carbon revenues, structural funds, economic stimulus funds, etc.
 4. **Markets** – Open markets to efficiency services
 5. **Profitability** – Make efficiency profitable for power entities
 6. (And more – Codes and standards, smart grids etc, etc)

1. Energy Efficiency is the Cornerstone for Successful GHG Cap-and-Trade



➤ Key points:

- ❖ Carbon price alone will not deliver what we need
 - ❖ Consumer/industry cost can be too high in power markets
 - ❖ Auction revenues create a huge new funding opportunity for EE
- California GHG Plan: 80% of reductions come from policies, only 20% from cap-and-trade based carbon price.

Conclusion:

**Create Efficiency Obligation to reduce emissions
and Design cap-and-trade to finance efficiency**



Practical question: Where will power sector reductions actually come from?

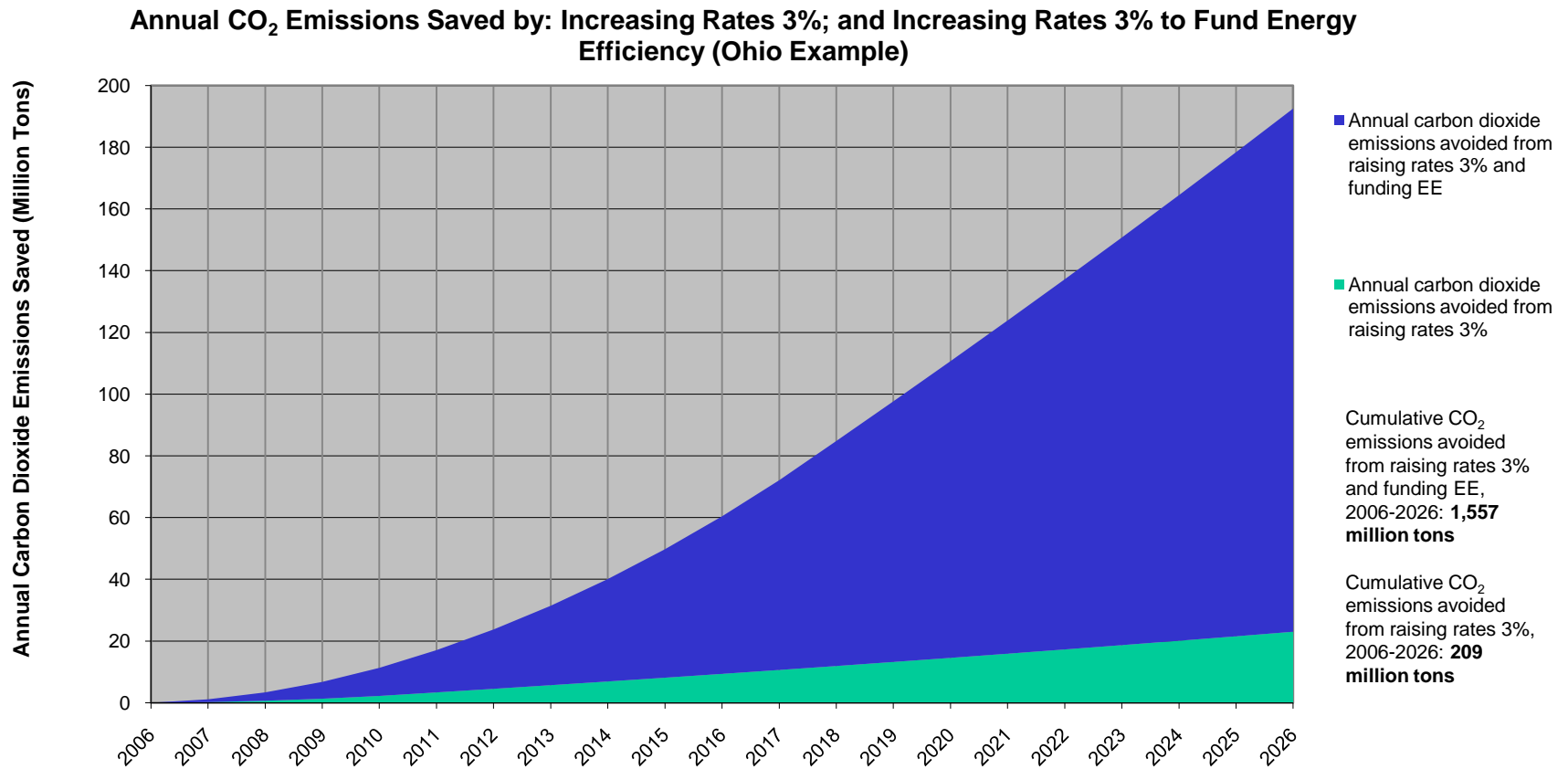
3 main possibilities:

- 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 ?**

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

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.);
- In liberalized markets, fossil units almost always set the clearing price (and long-term prices follow);
- SO: Carbon penalty on sellers raises prices paid to all generation, including nuclear, with little CO2 effect;
- “Windfall gains” to existing generators paid for by consumers;
- **In the biggest US market (PJM) this could cost consumers \$800 per ton actually reduced -- a political disaster.**

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 –5th 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*



Could Europe Create a Carbon Allocation for Efficiency ?

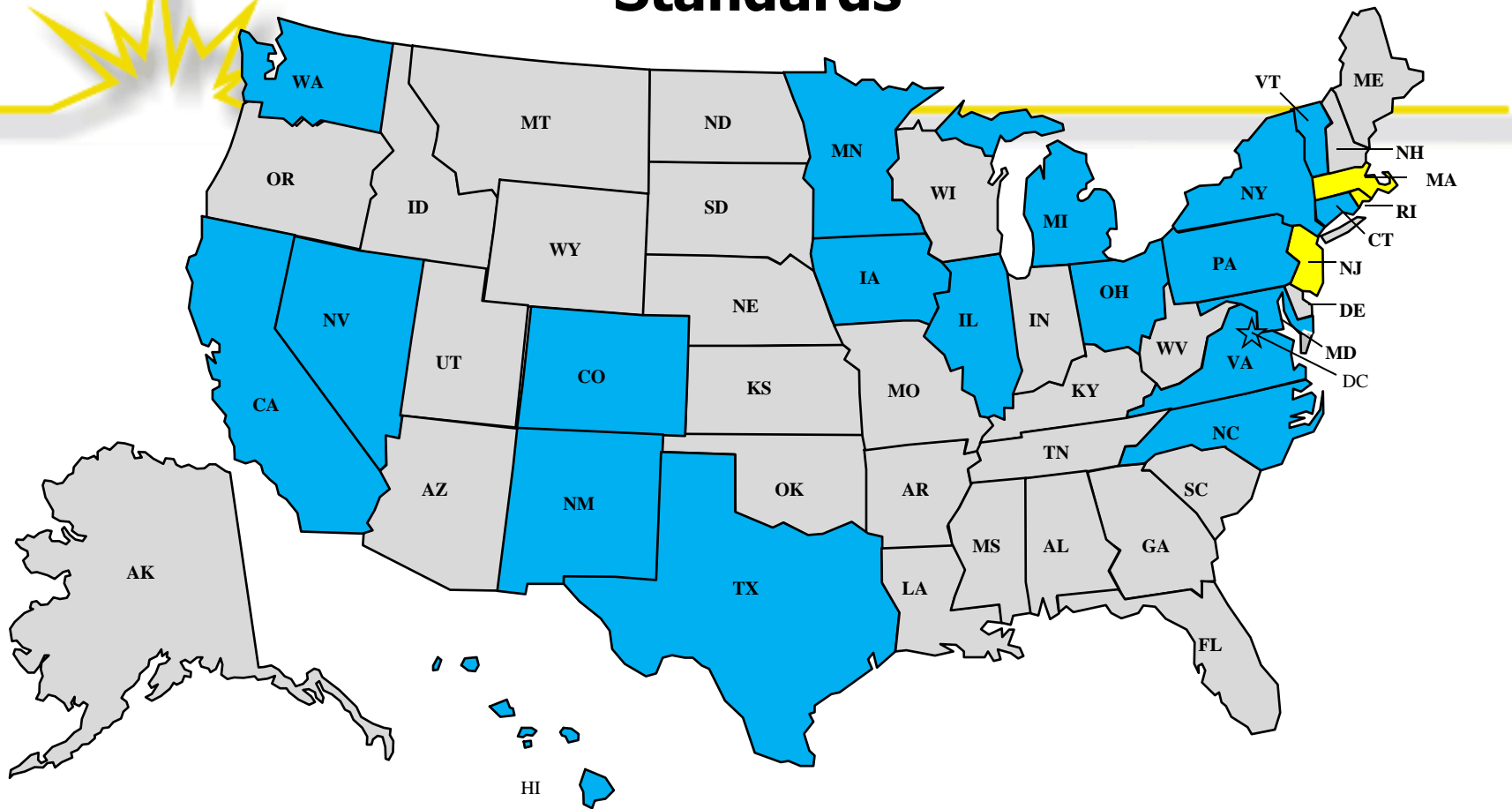
- **Goal:** Allocate a sizable pool of carbon allowances to utilities, LDCs, or efficiency agencies to promote end-use efficiency
- **US national proposal (in Waxman-Markey, now pending)**
 - ❖ 10% of allowances to US states for public-run EE programs
 - ❖ 35% of allowances to LDCs for various purposes (EE permitted, not mandated)
 - ❖ ~10% of allowances to gas LDCs/ 1/3 must be spent on EE
- **HOW CAN THIS BE DONE IN THE EU?**
 - ❖ Balance between Member State and EU action
 - ❖ Finance Ministries' policies ironically block efficient solutions



Efficiency Policy 2: Efficiency Obligations

- **20/20/20 – Can the EU and/or MS make the EE obligation mandatory? If so, who is responsible?**
- Indications from the US:
- **US states** are increasingly turning to EE as a resource, 19 states now have mandatory EE targets;
- **Great variety in administration** – Distribution utilities, State agencies, “efficiency utility” option.
- **US Congress considering national EERS**
 - ❖ Either stand-alone or as an essential complement to cap-and-trade for carbon

19 States with Energy Efficiency Resource Standards



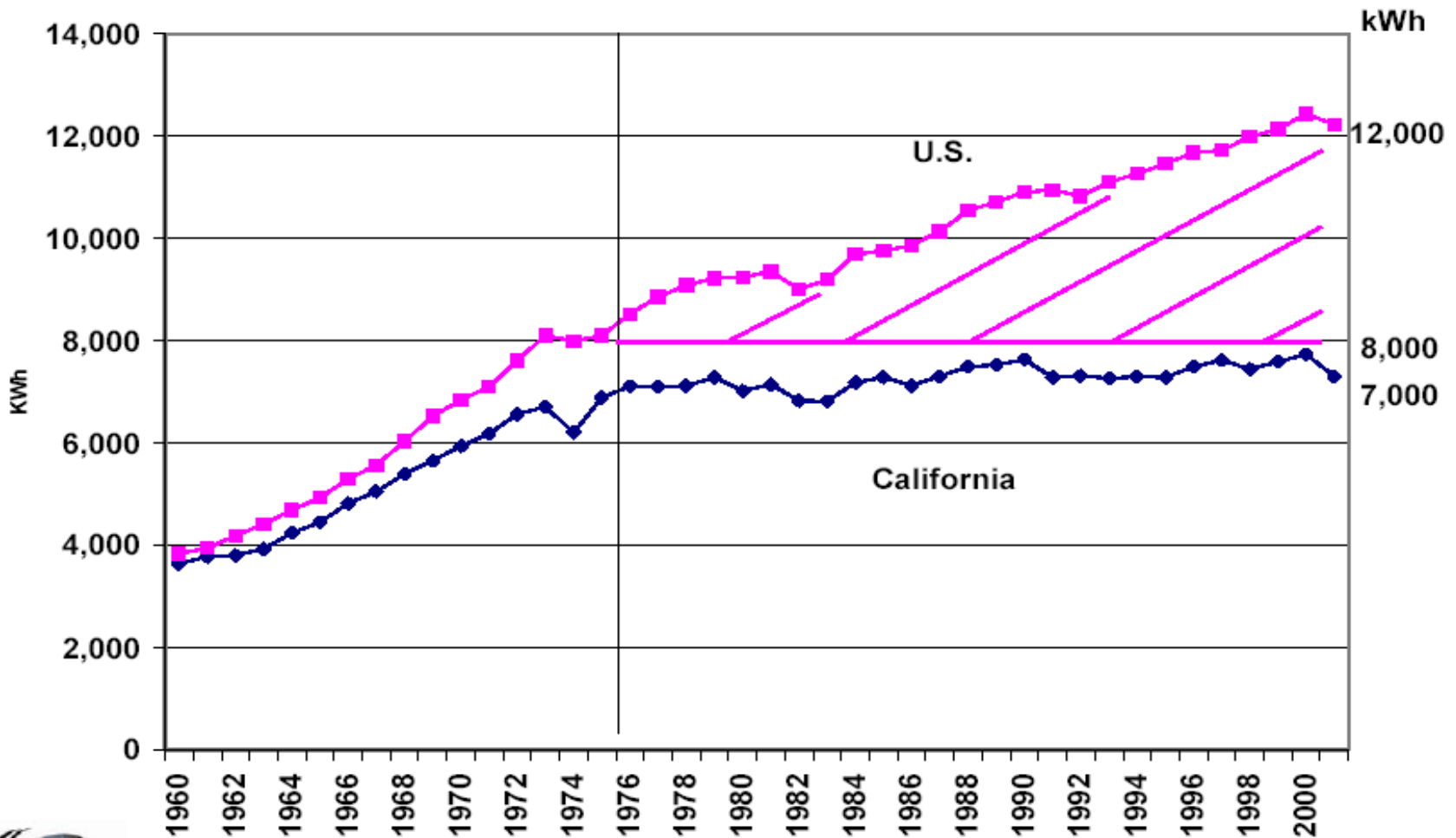
 States with EERS
 States with pending EERS

Source: ACEEE, March 2009

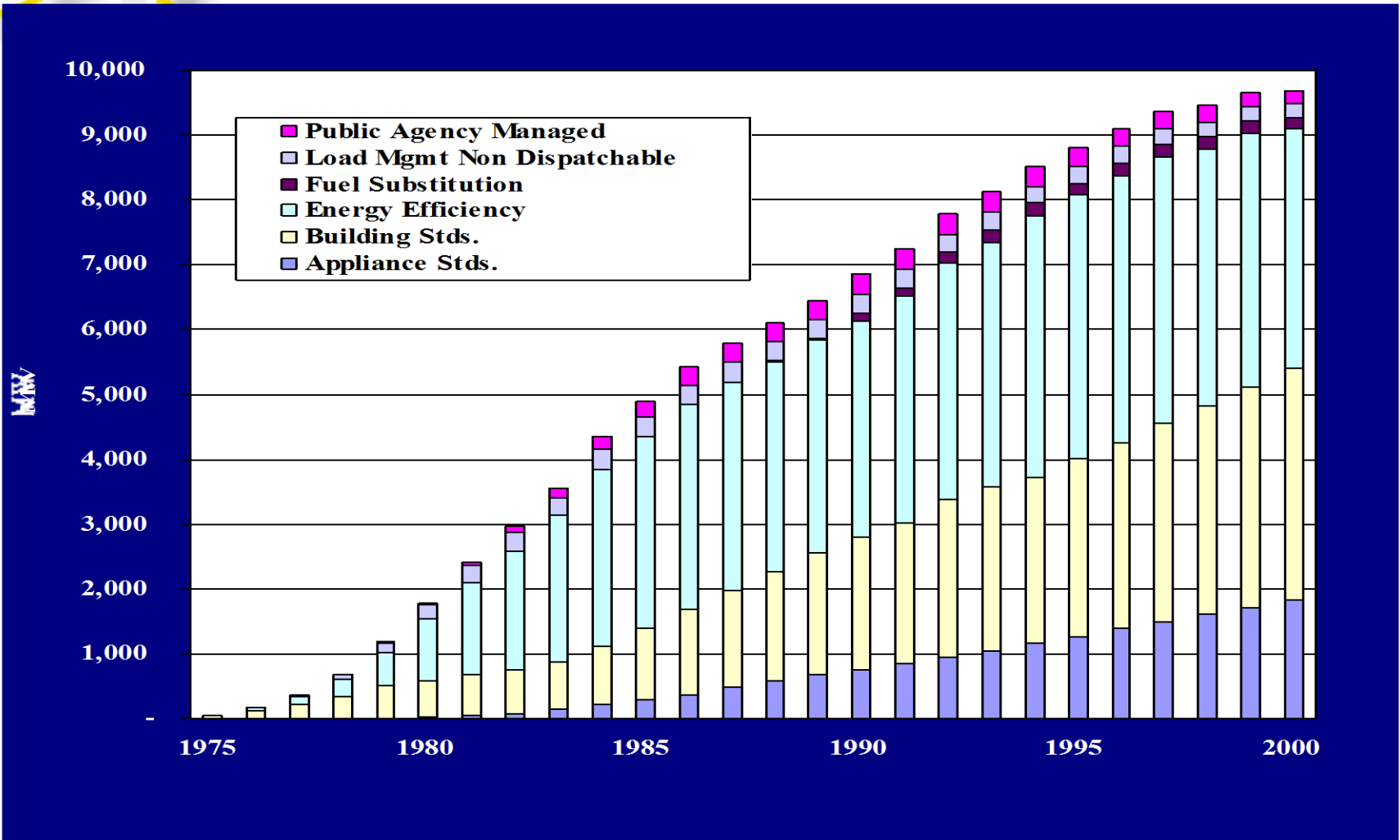
These states plus other utility EE will save ~6% of total US power by 2020

Long term efficiency policies drive lower per capita use in CA

Total Electricity Use, per capita, 1960 - 2001



California: a portfolio of efficiency measures pays off over time



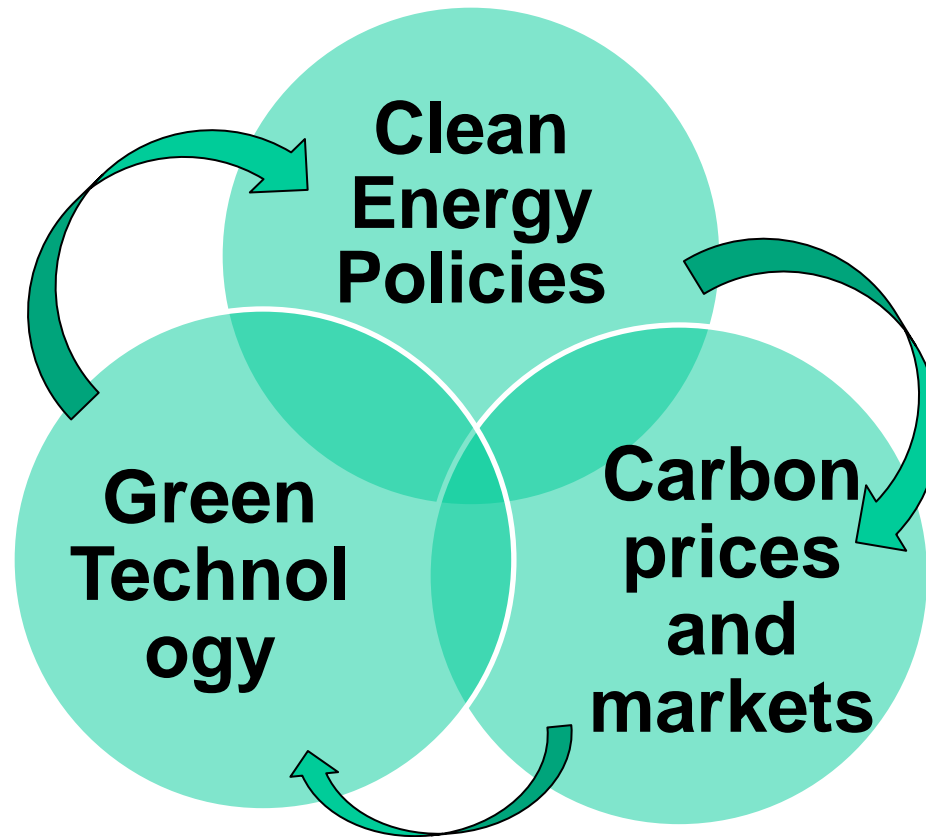
California efficiency investments lower demand by 25% over 25

Other elements of the “efficiency first” climate strategy



- Better rate designs and “smarter” power grids
- Advanced codes & standards for buildings and appliances
- Consumer-focused “whole buildings” retrofit programs
- Making efficiency profitable to utilities and other providers
- Reforming power market rules to put efficiency and supply on an equal basis

Conclusion: Carbon Prices Alone Are Not Enough



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)*
- *“Energy Efficiency Policy Toolkit” (C Harrington et al, RAP August 2006)*
- *“Efficient Reliability: the Critical Role of Demand-Side Resources in Power Systems and Markets” (R Cowart, for the National Association of Regulatory Utility Commissioners, June 2001)*
- *“Why Carbon Allocation Matters – Issues for Energy Regulators” (RGGI memo March 2005)*

Richard Cowart, Regulatory Assistance Project

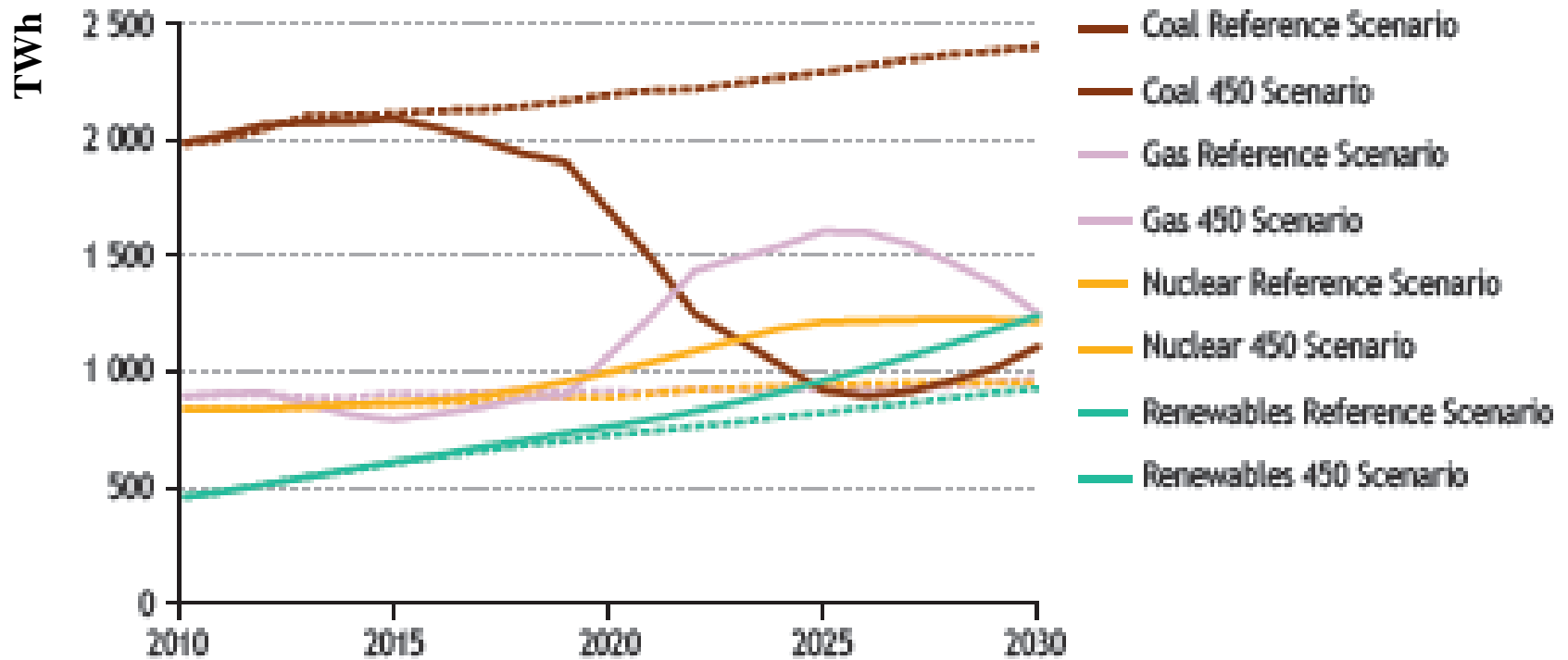
Posted at www.raponline.org

Email questions to rcowart@raponline.org



Trajectories for the U.S. energy sector

U.S. Electricity generation by type to get to a 450 ppm scenario



Trajectories for the U.S. energy sector

CO2 emission savings in the U.S. power generation sector relative to the 2007 fuel mix to get to a 450 ppm scenario

