

Climate Change and RGGI

Transforming Business as Usual

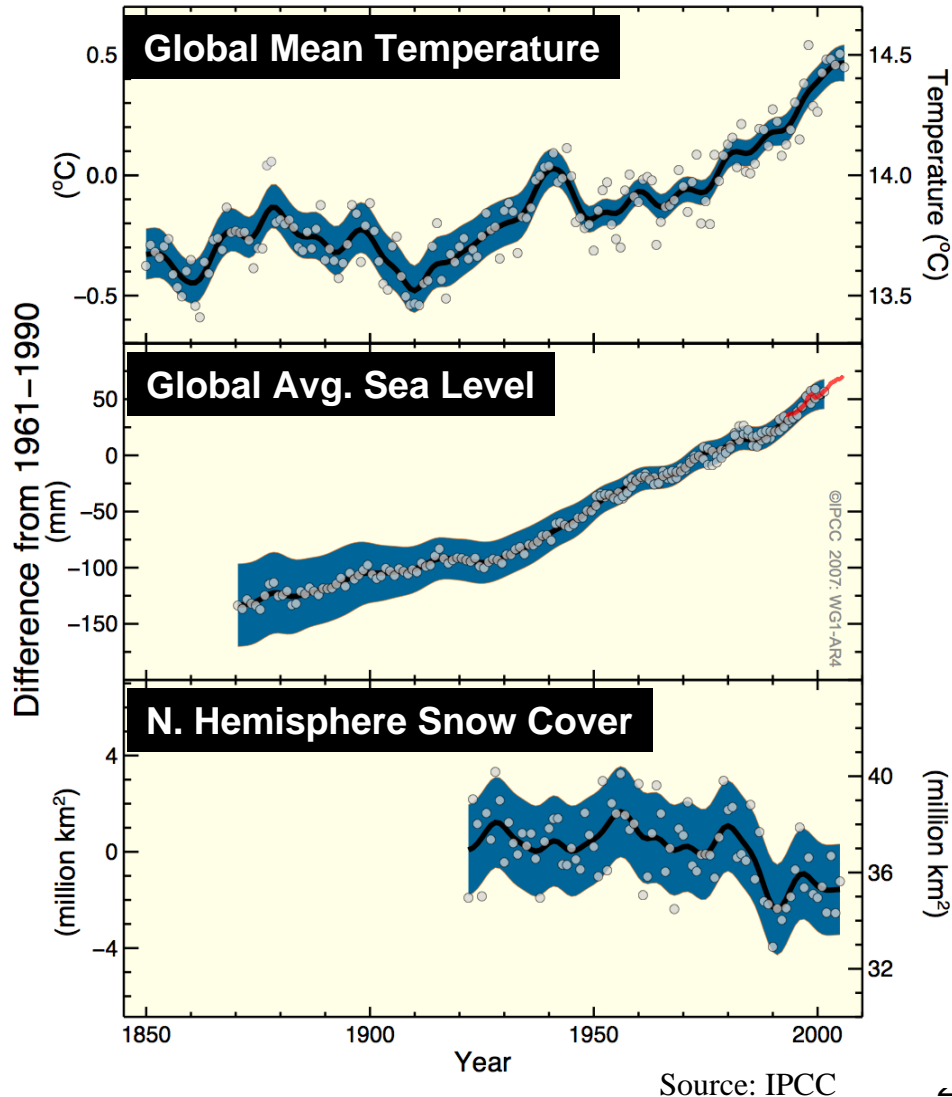
Donald McCloskey

Director- Environmental Strategy and Policy
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April 23, 2008

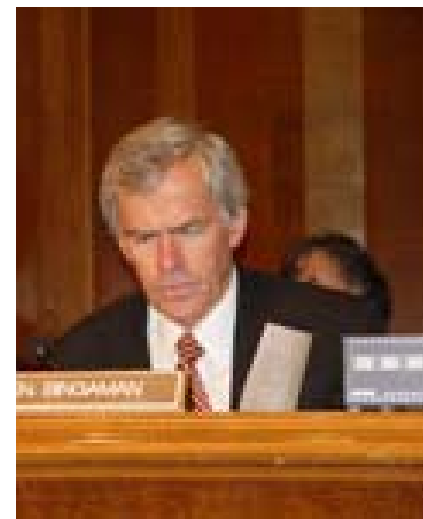
Global Warming is Real & Happening Now

Changes in Temperature, Sea Level & Snow Cover

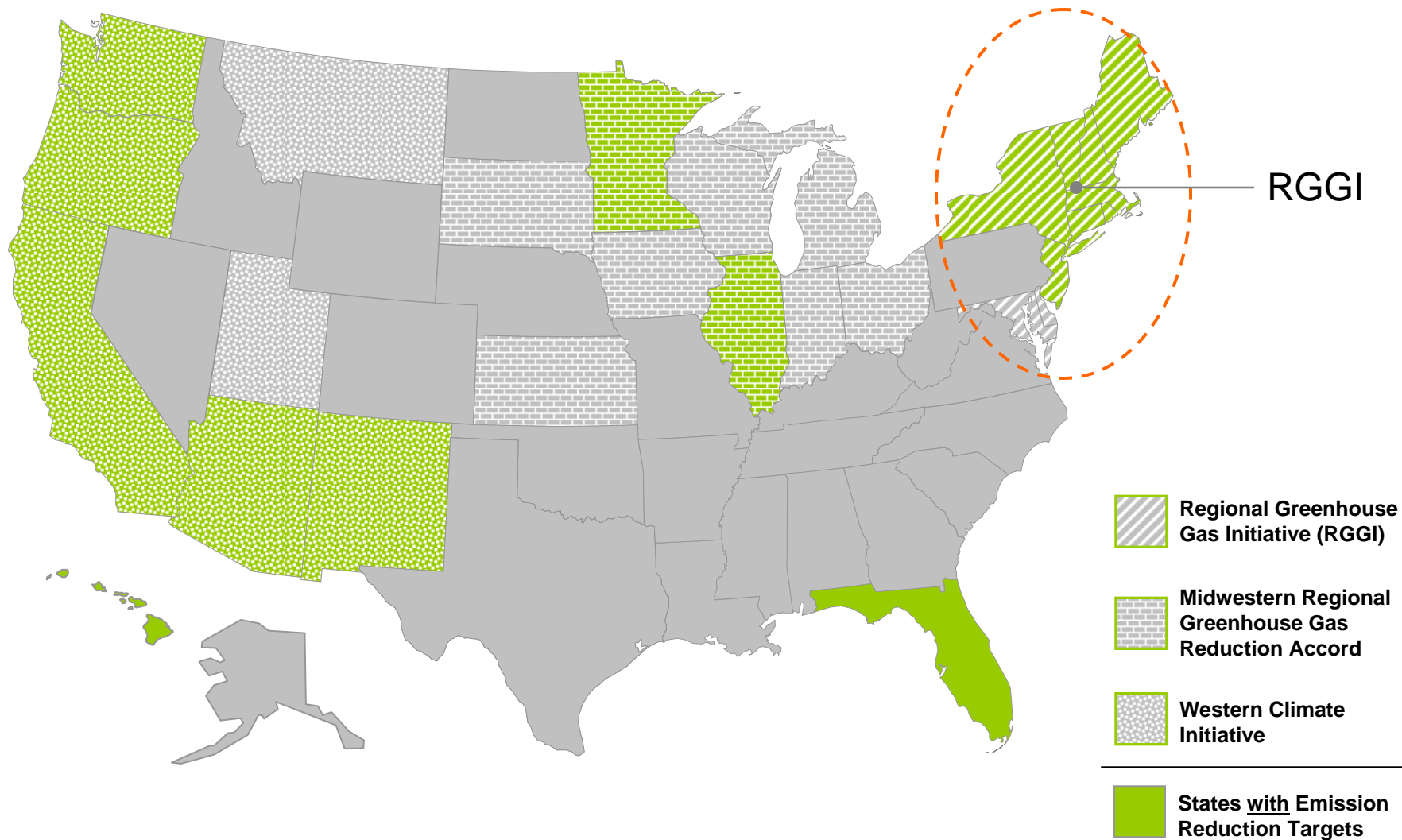


*“Warming of the climate system is **unequivocal**, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global mean sea level.”* - R.K. Pachauri, IPCC Chair

Society is Responding

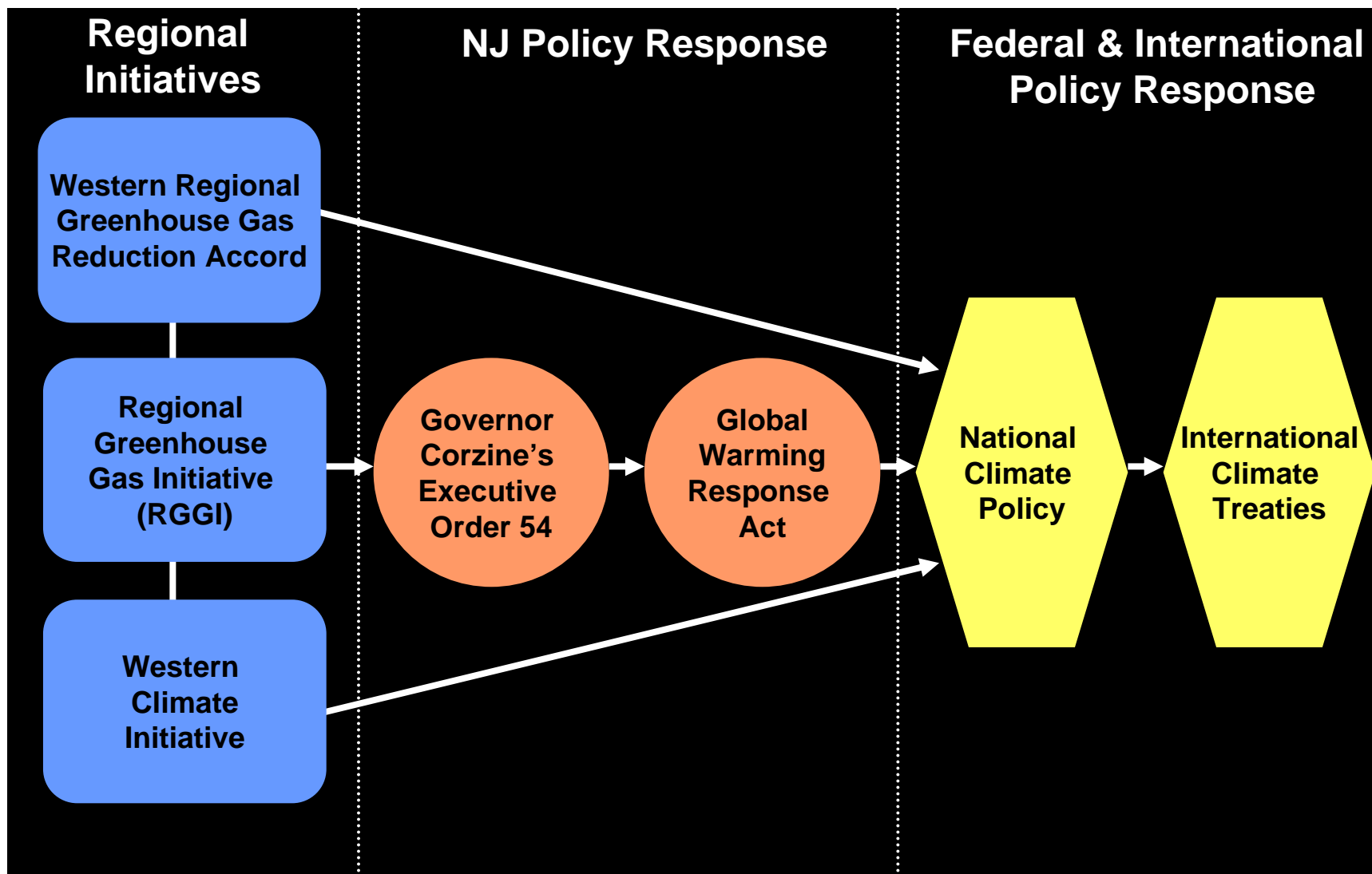


Regional and State Climate Change Initiatives



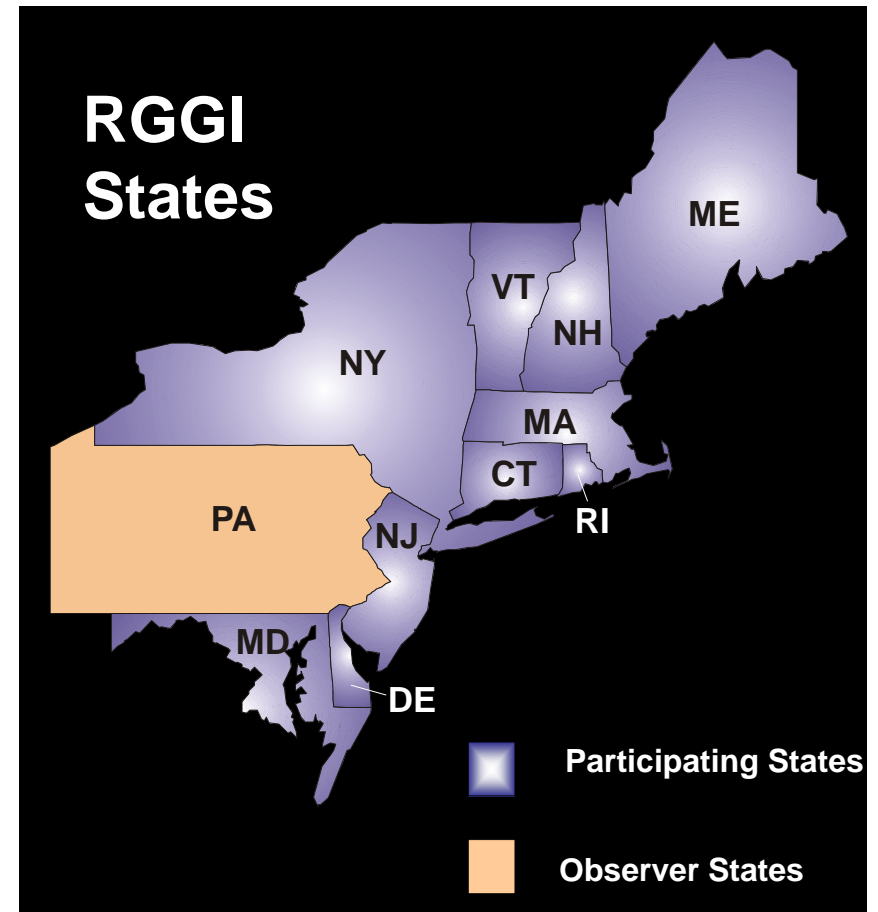
44% of the U.S. population lives in states with emission reduction targets

Direction of Climate Policy



Regional Greenhouse Gas Initiative (RGGI)

- **Cooperative effort by 11 NE states to design a regional cap-and-trade program to reduce carbon dioxide (CO₂) emissions**
 - Full participants – CT, MA, MD, ME, NH, VT, NY, NJ, RI, and DE
 - Observers – PA, DC, and Eastern Canadian Provinces and New Brunswick
- **Timeline**
 - April 2003 process proposed by Governor Pataki
 - 2003 – 2006 – Stakeholder process
 - December 20, 2005 Final 7 state MOU
 - March 23, 2006 – Draft Model Rule
 - August 15, 2006 – Final Model Rule & amended MOU
 - 2007-2008 – State level adoption
 - First RGGI allowance auction September 2008
 - January 1, 2009 – Implementation



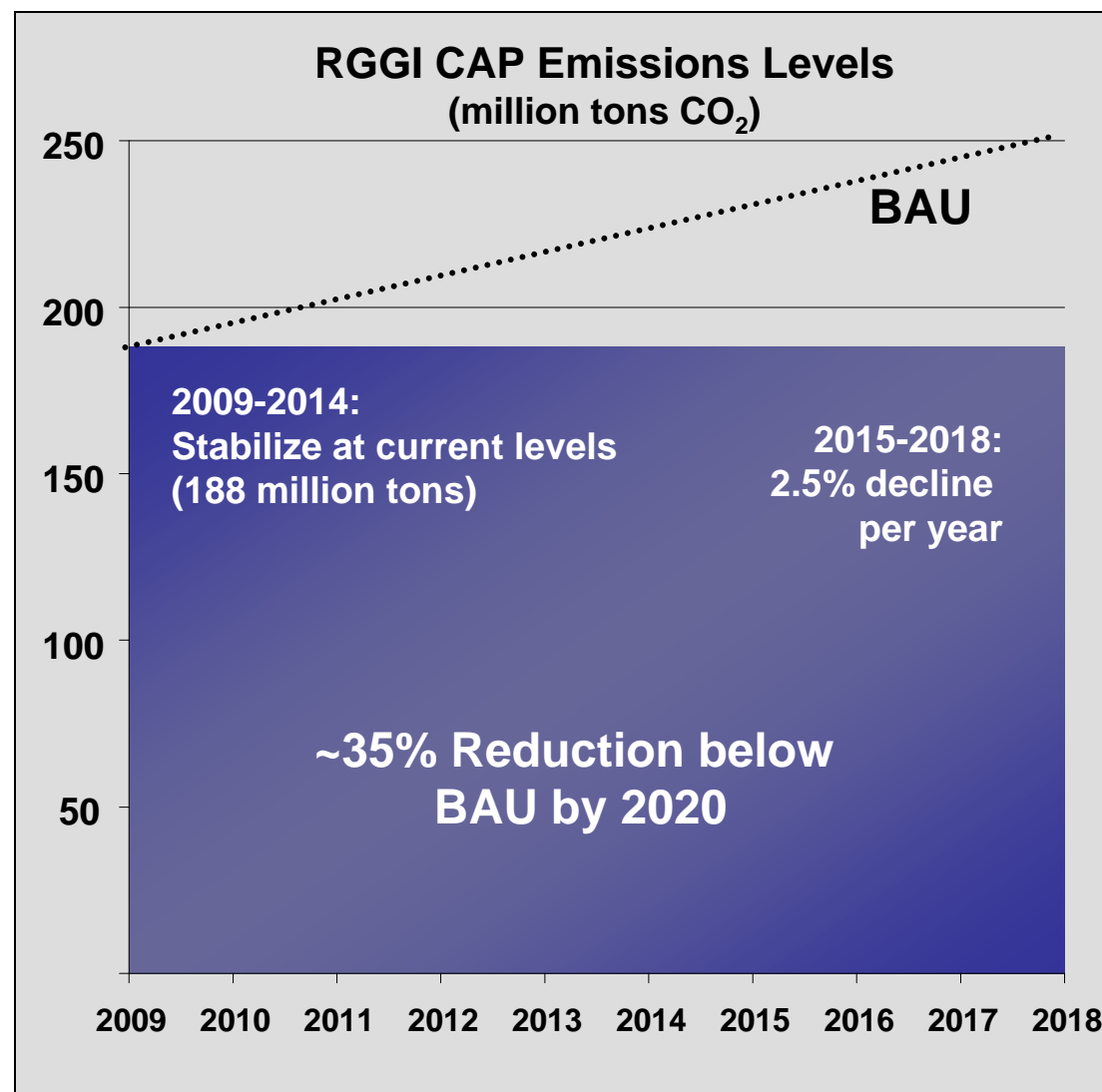
RGGI Program CAP Seeks Real Reductions

- **Affected Sources**

- Fossil fired electric generating units with a capacity of 25 megawatts (MW) and larger

- **Targets and Timing**

- Three-year compliance periods with the first running from 2009-2011.
- Stabilization of CO₂ emissions at current levels through 2015 (~188 million tons per year).
- Achieve a 10% reduction of CO₂ emissions below current levels by 2019.
- This translates into ~13% reduction below 1990 levels or ~35% reduction from BAU levels by 2020.



RGGI Allowance Auction

- **188 M ton regional CO2 cap**
- **States committed to 100% Auction**
 - NJ, NY, MA, MD, VT, RI, CT, and ME
- **Structure and Format**
 - Uniform, joint, regional auction for all states
 - Lot size of 1,000 allowances
- **Schedule**
 - Quarterly auctions—first September 10, 2008.
 - Current year and future year vintage will be auctioned
- **Participation**
 - Open to all financially qualified parties.
 - Limit bidders' volume to 25% of allowances offered
- **Reserve Price**
 - Reserve price will be utilized and disclosed prior to each auction
 - First auction reserve price is \$1.86/ton (based on RGGI modeling)
- **Auction Results**
 - Auction clearing price and the total amount of allowances sold will be published on the RGGI auction website.



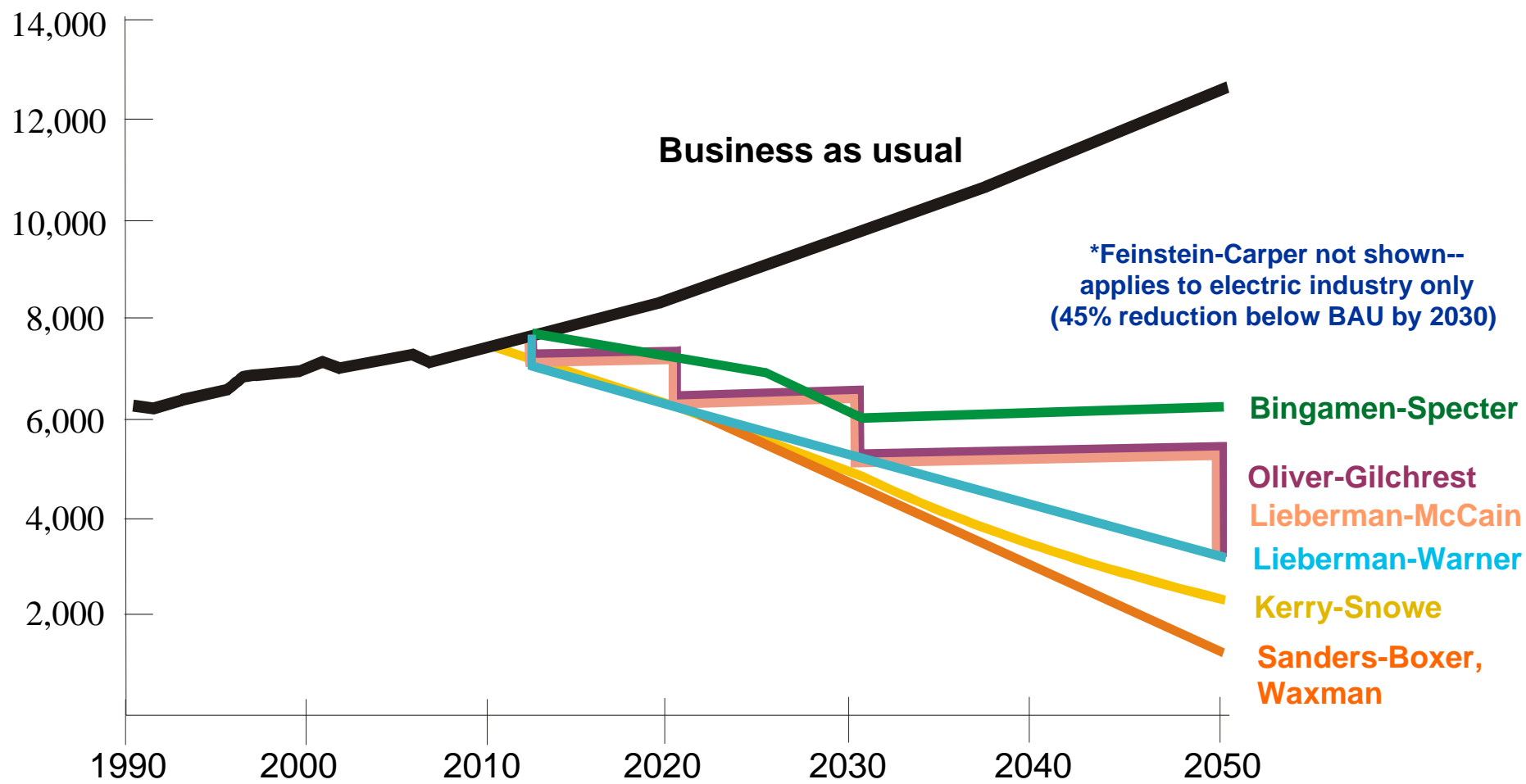
NJ Executive Order 54 and the Global Warming Response Act

- Established GHG reduction targets across all sectors
 - Achieve 1990 levels by 2020; about a 20% reduction
 - Achieve 2006 levels by 2050; about an 80% reduction
 - Develop an GHG emissions inventory
 - Establish a monitoring system to assess progress toward targets

U.S. Policy Response—Federal Cap-and-Trade?

Comparison of GHG Emissions Reduction Proposals
(110th Congress Legislative Proposals)

Million metric tons
CO₂ equivalent



Business Concerns with Carbon Policies

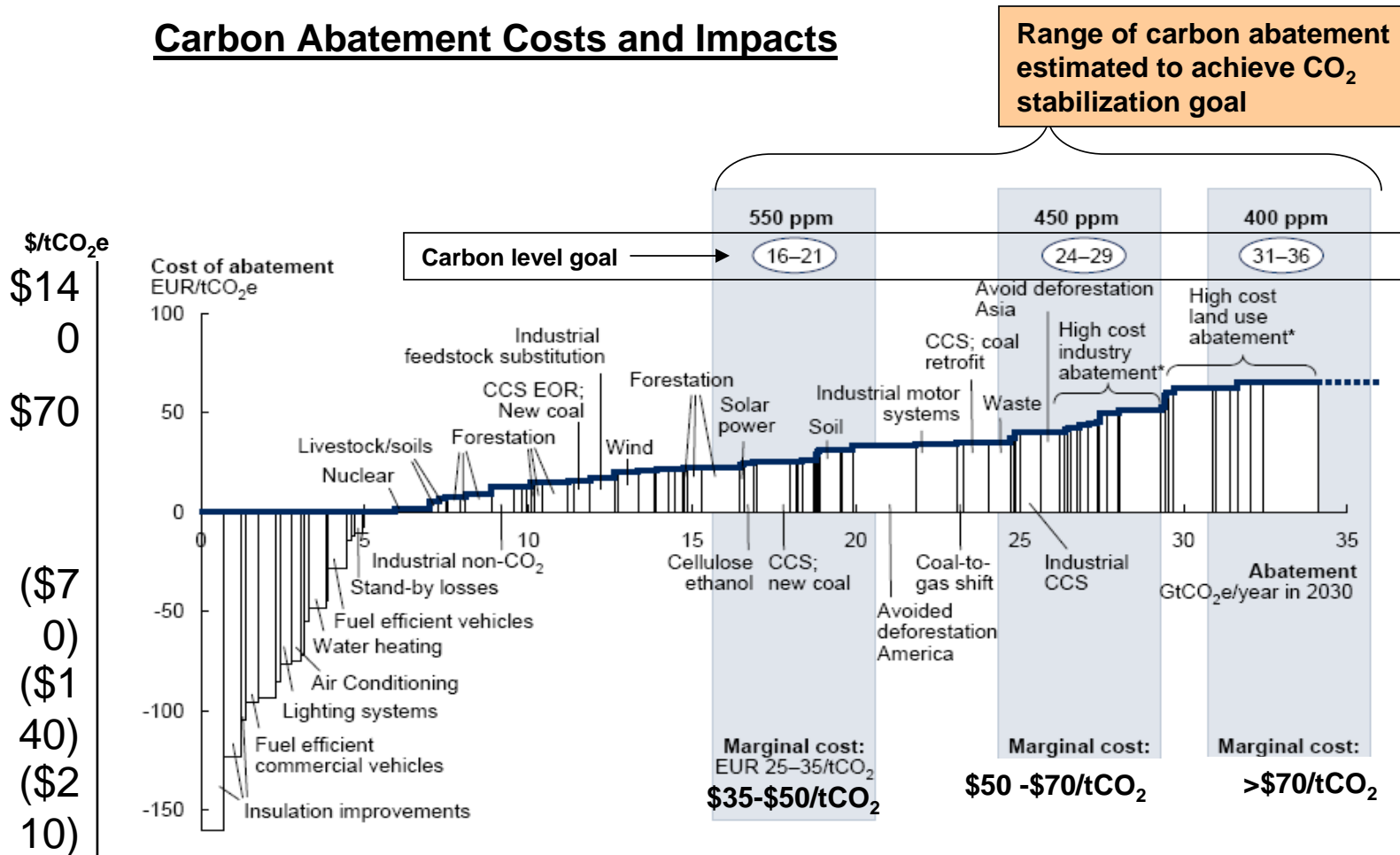
- **Uncertainty**
 - What will it cost?
 - How will it affect my competitiveness?
 - Who will be winners and losers?
 - What investment strategy?
 - When will policies take affect?
- **Inequity/Leakage**
 - Un-level playing field
 - Regional or global competitiveness
 - Leakage of economic activity (jobs/investment)
- **Ability to adapt quickly**
 - How to comply?
 - Will technology be available?

Will Carbon Policy Send Business Off a Cliff?



Regardless of the regulatory mechanism imposed, reducing and stabilizing the amount of carbon in the atmosphere will come at a cost to society.

Carbon Abatement Costs and Impacts



Source: McKinsey Global Institute

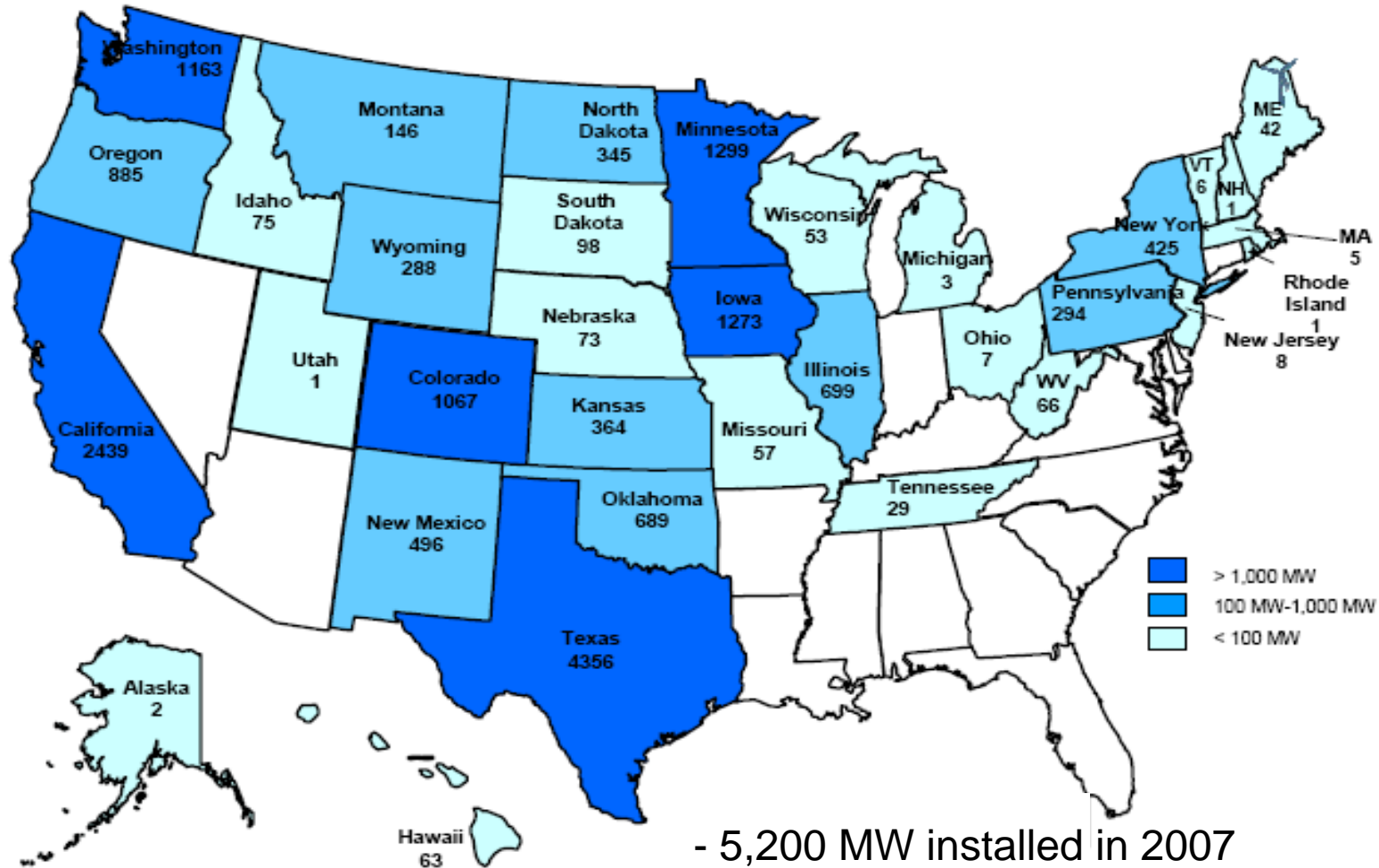
Energy Efficiency is the “Low-Hanging Fruit”

- Energy efficiency improvements are generally the lowest cost means of reducing emissions
- Most energy efficiency investments pay for themselves (with or without climate policy) in a few years
- Energy efficiency provides business opportunities across many sectors of the economy from energy, to appliances, to construction and automobiles
- Climate policy will only strengthen energy efficiency business opportunities



30% of U.S. Electric Capacity Additions in 2007 were Wind Power

Megawatts of Installed Utility-Scale Wind Power as of December 31, 2007

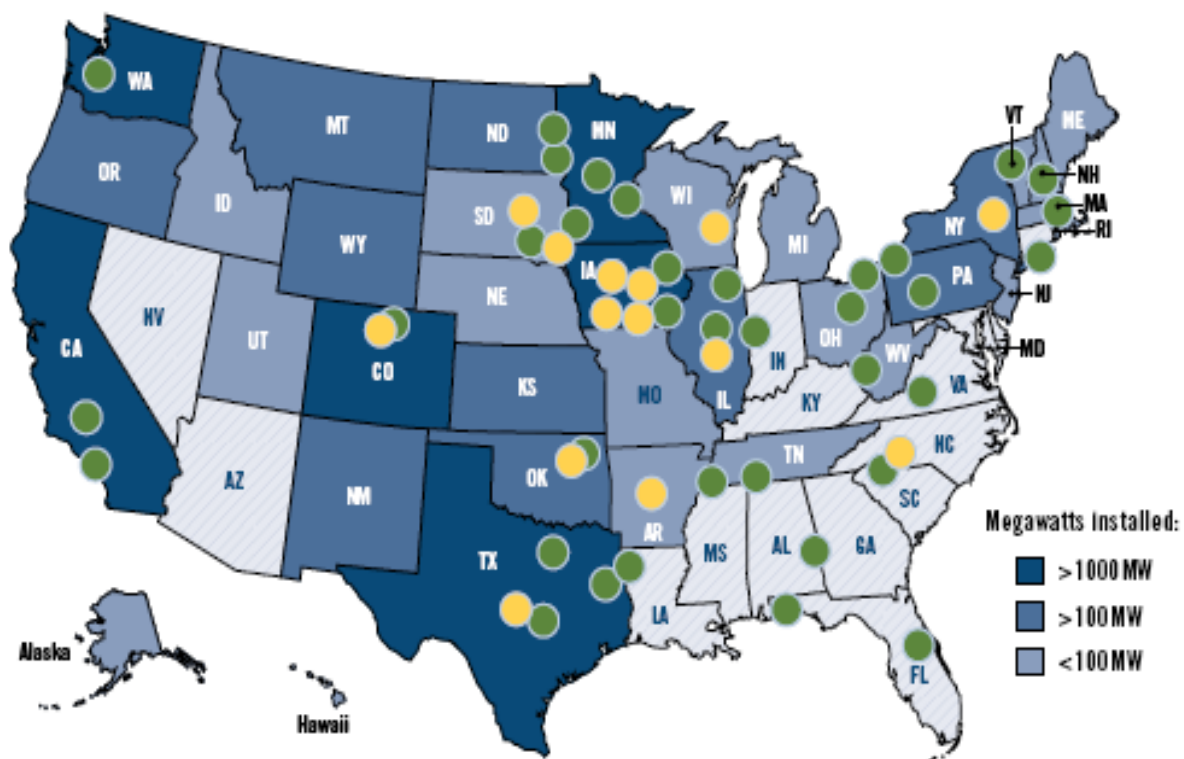


- 5,200 MW installed in 2007
- 16,800 MW total by end of 2007

Source: AWEA

Wind Energy is Creating Investment and Jobs

Wind Energy Manufacturing Facilities



Source: AWEA

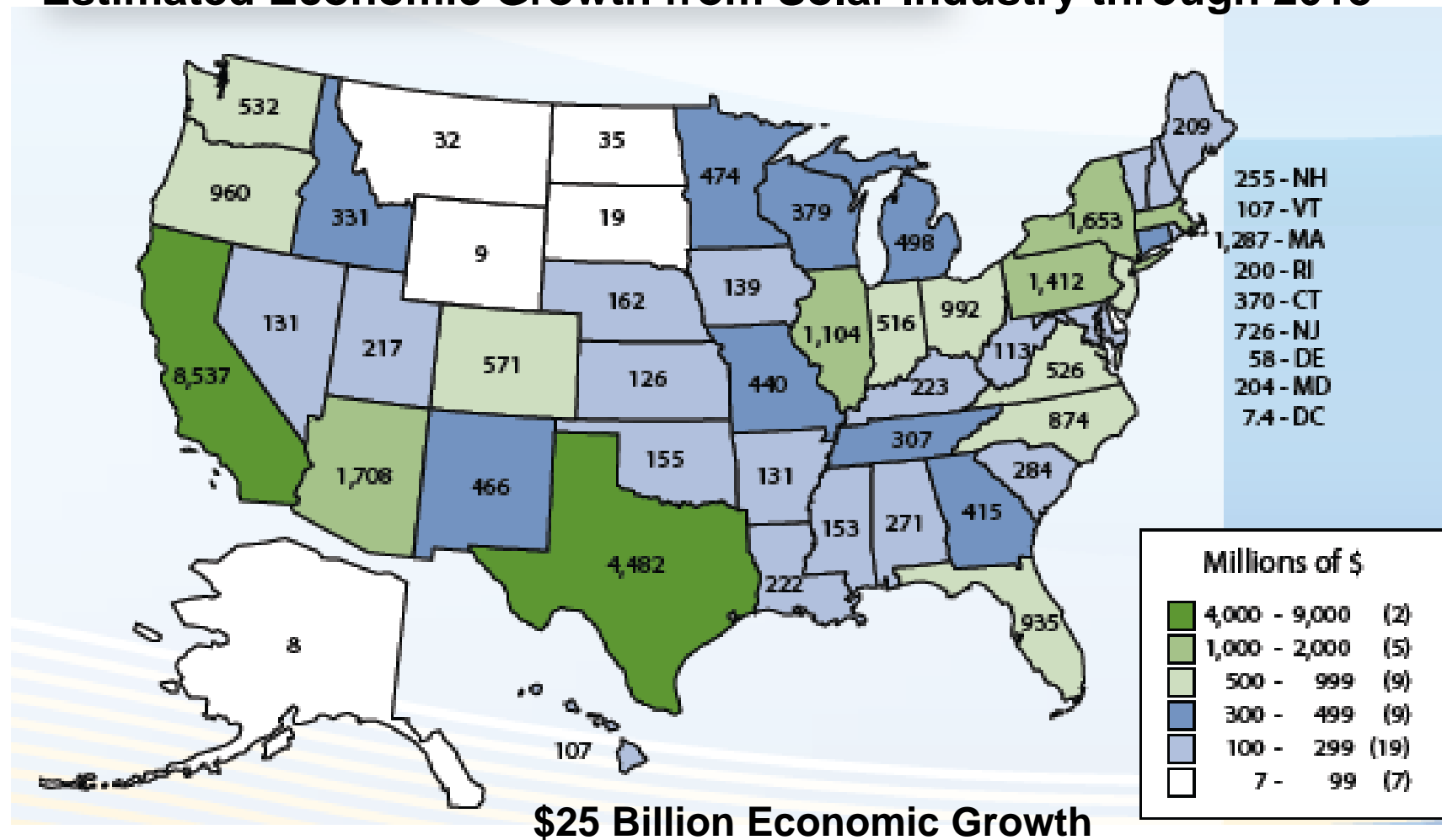
- Examples of facilities opened or announced in 2007**
 - LM Glasfiber (blades): Little Rock, AR
 - Vestas (blades): Windsor, CO
 - Acciona (turbines): West Branch, IA
 - Hendricks Industries (towers): Keokuk, IA
 - Siemens (blades): Fort Madison, IA
 - TPI Composites (blades): Newton, IA
 - Trinity Structural Towers (towers): Clinton, IL
 - PPG Industries (fiberglass): Shelby, NC
 - GE Energy (service): Schenectady, NY
 - DMI (towers): Tulsa, OK
 - Knight & Carver (blades): Howard, SD
 - Molded Fiberglass (blades): Aberdeen, SD
 - Composite Technology/DeWind (assembly): Round Rock, TX

- Examples of facilities in operation in 2006**

Industry achieved 29% Growth rate over last 5 years

Solar Industry Economic Growth

Estimated Economic Growth from Solar Industry through 2015



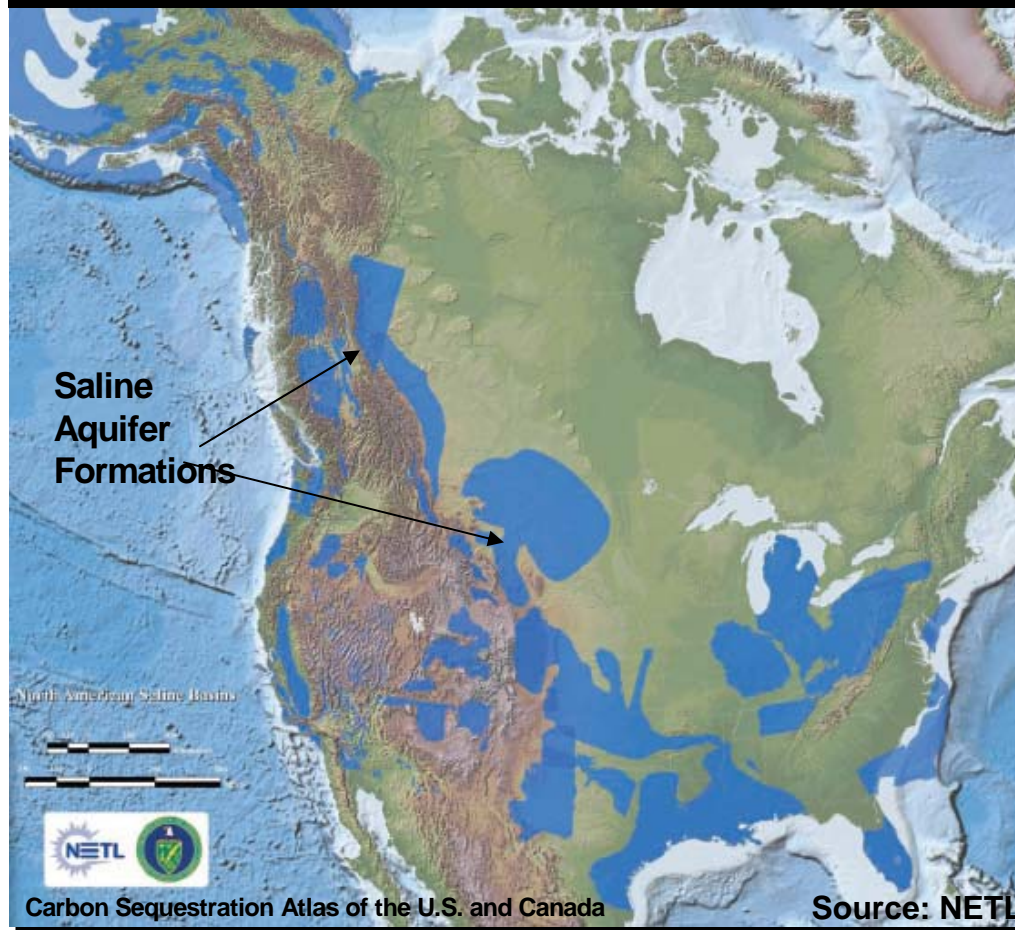
Nuclear Power

- **About 20% of U.S. electricity comes from nuclear power**
 - Nuclear Energy Institute estimates that nuclear power avoids about 700 million tons of CO₂ a year in the U.S.
 - Over 3 times the total emissions covered by the RGGI program
- **Climate policy may help create opportunities for nuclear power to reemerge as an important generating technology**
 - It is difficult to imagine a carbon constrained future without considerable nuclear power generation



Geologic Sequestration -- Potential CO₂ Storage Solution?

Vast Saline Aquifer Formations Provide Significant CO₂ Sequestration Potential



Geologic Sequestration Options

Saline aquifers—inject into deep saline formations that may be able to store hundreds of billions of tons of CO₂.

Oil and gas formations—inject into depleted or mature oil and gas fields (can provide enhanced oil recovery in mature fields)

Unminable coal seams—Inject into coal seams that absorb CO₂ and desorb methane for recovery

Shale formations—inject into shale formation that absorb CO₂ and desorb methane for recovery

Business opportunities?

Conclusions



- **Climate change science is sending an increasingly clear message that the time to act is now**
- **The policy direction is towards implementation of federal climate policy and participation in international treaties**
- **Business community concerns are raised due to the uncertainty about the timing and direction of a national policy**
- **PSEG believes climate change policies will create substantial new business opportunities in energy efficiency, renewable energy and central station power**
- **Across the economy, business opportunities are emerging from the technical demands of addressing climate change**
- **The key is to seize the opportunities created by the changing business climate being driven by the changing global climate**