

Energy Efficiency as an Environmental, Economic and Resource Solution

Sue Gander

Clean Energy-Environment Partnership Program

Climate Protection Partnerships Division

U.S. Environmental Protection Agency

New Jersey Clean Air Council

Trenton, New Jersey

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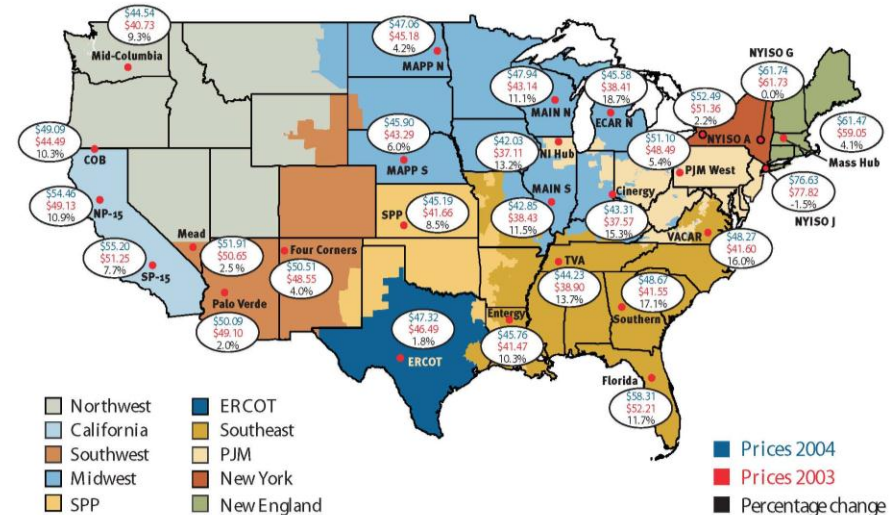
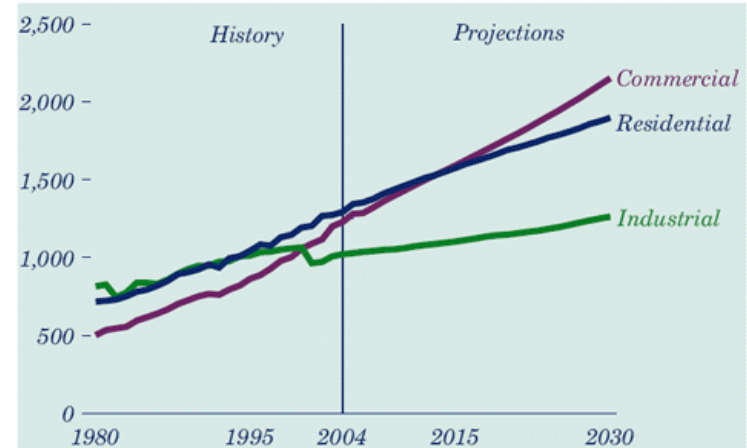
Important Time for Energy and Environmental Issues

- Convergence of environmental with resource and economic issues
- Energy efficiency offers cost-effective solution
- Decade of experience and success at state and federal levels
- Key barriers remain
 - State policies key to expanding energy efficiency
 - Opportunities for state-federal collaboration
- EPA efforts
 - Removing barriers; helping clean energy compete
 - ENERGY STAR
 - National Action Plan for Energy Efficiency
 - State Clean Energy-Environment Partnership Program
 - Combined Heat and Power Partnership
 - Leading example: Technical assistance for OTC High Energy Demand Day Initiative

Key Energy Challenges

- Energy demand is growing
 - Electricity
 - Natural gas
- Cost of generation is increasing
 - Coal prices
 - Gas prices
- Natural gas prices increasing / volatile
- Reliability issues
- Carbon risk
- Pending large transmission and generation investments in uncertain investment world

Figure 55. Annual electricity sales by sector, 1980-2030 (billion kilowatthours)



Air Quality Issues Mounting

In no particular order...

Clean Air Interstate
Rule (CAIR)

Clean Air
Mercury Rule
(CAMR)

8-hr Ozone
Standard

Fine Particulate
Standard

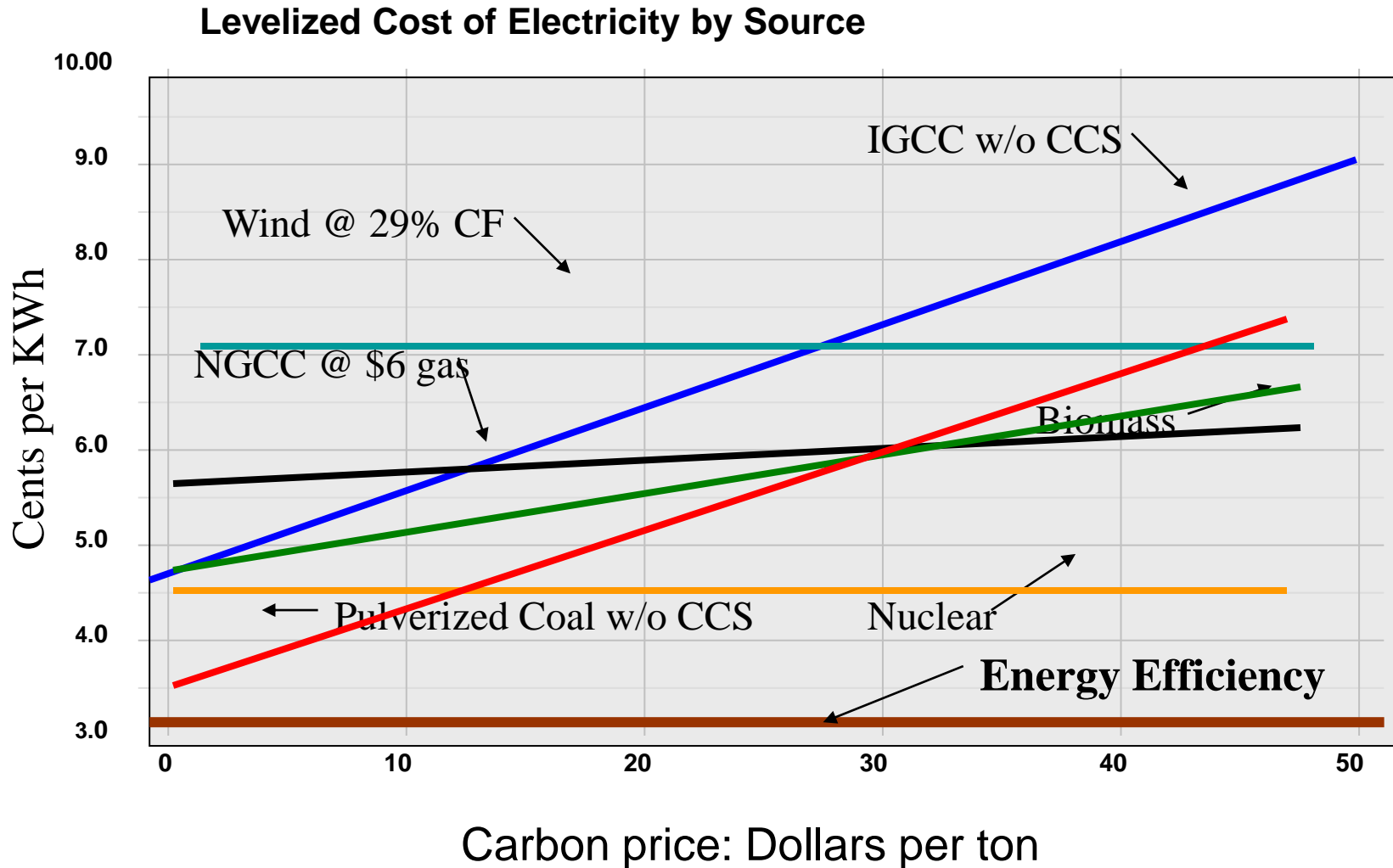
Haze Rule

Cardiac Ridge, Wasatch Mountains, Utah

Broad Benefits of Energy Efficiency

- Utility System Benefits
 - Quick fix with longer term benefits
 - Improved security of electricity and gas systems
 - Lower peak demand / improved reliability
- Environmental
 - Lower greenhouse gas emissions and criteria pollutants
 - Lower water use
- Economic
 - Lower cost compared to new generation and transmission
 - Downward pressure on natural gas prices
 - Lower wholesale electricity prices
 - Improved local economy
 - Improved service to low income and seniors
- Risk Management
 - Diversified a utility's supply portfolio
 - Reduce environmental regulatory risk to utilities

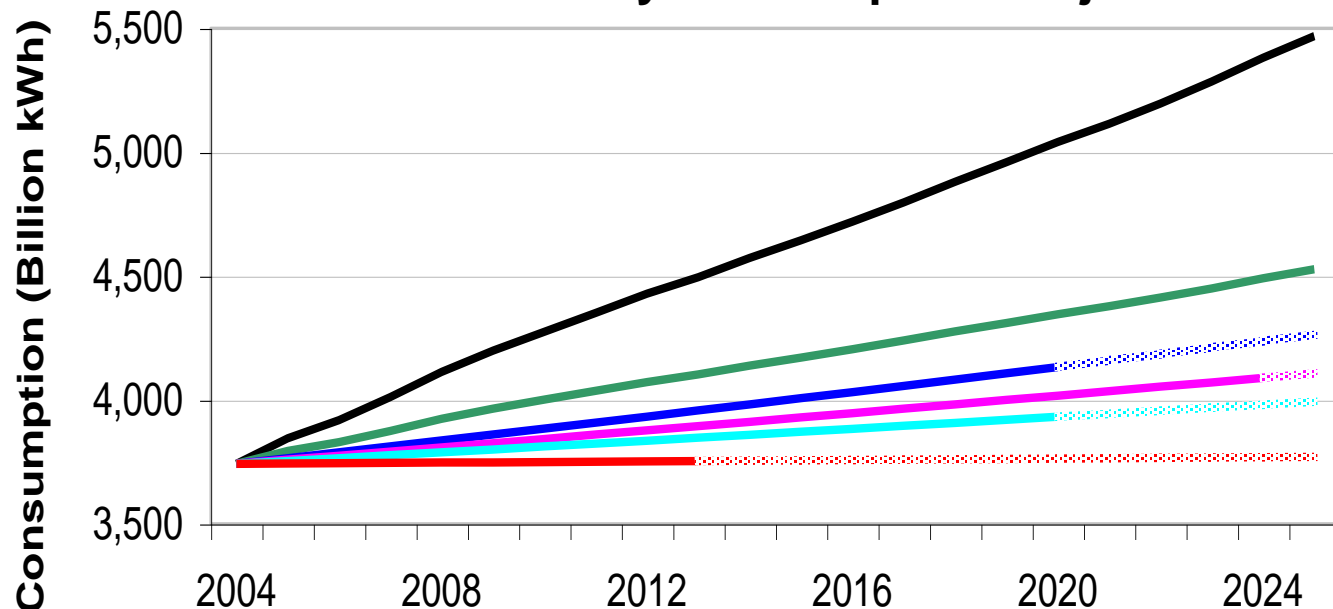
Energy Efficiency is Cost-Competitive – More So as Carbon Prices Grow



Source: EPRI, ACEEE

Untapped Energy Efficiency Can Lower Electricity Growth by 50%

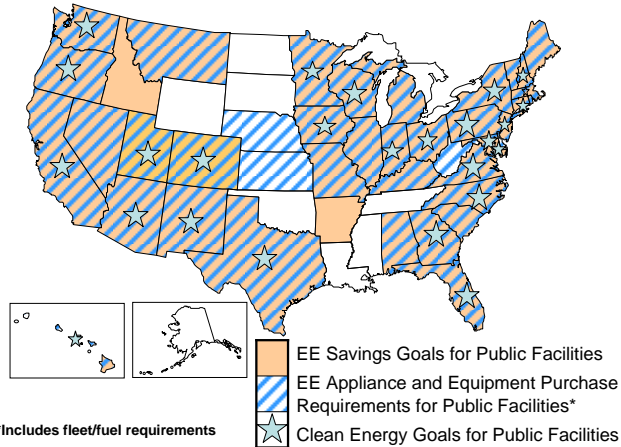
U.S. Electricity Consumption Projections



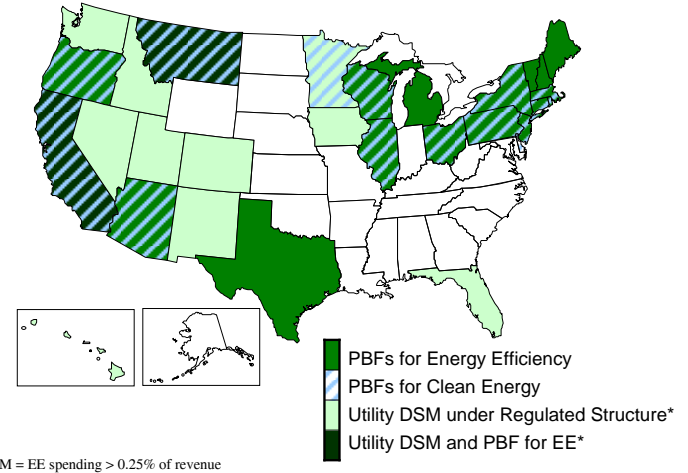
— AEO 2005 Reference Case		[avg. annual growth 1.8%]
— Half Growth Scenario	(17% reduction by 2025)	[avg. annual growth 0.9%]
— 5 Labs Study	(18% reduction by 2020)	[avg. annual growth 0.6%]
— ACEEE median achievable	(24% reduction in 20 years)	[avg. annual growth 0.5%]
— NV Study	(22% reduction by 2020)	[avg. annual growth 0.3%]
— NEEP Study	(17% reduction by 2013)	[avg. annual growth <0.1%]

States Supporting Clean Energy

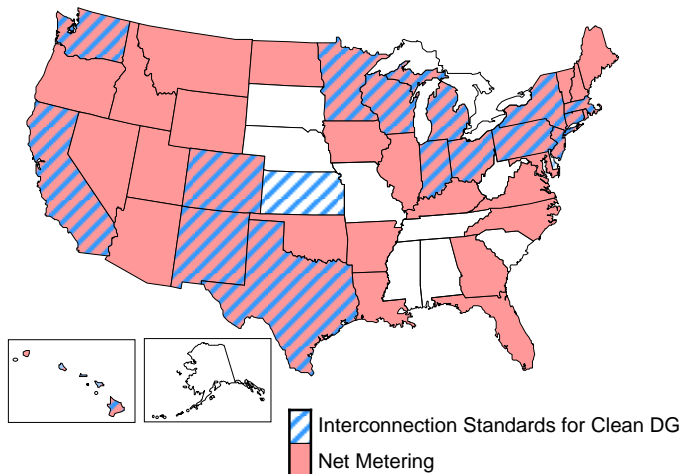
States Leading by Example through Clean Energy Goals for State Government



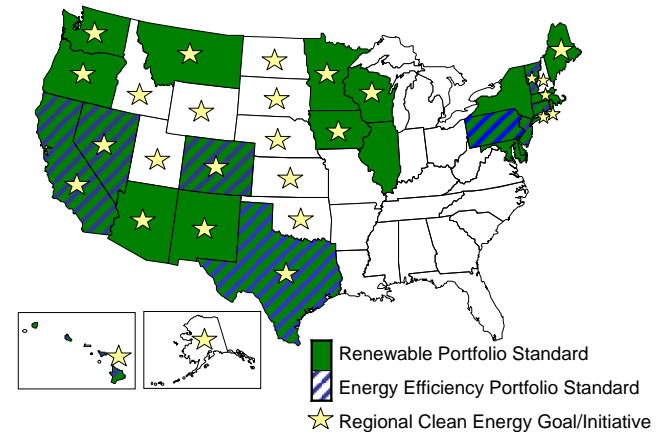
States Supporting Funds for Clean Energy



States Supporting RE and CHP through Interconnection Standards and Net Metering



States Encouraging Clean Energy with New Goals and Targets



Barriers Still Persist...EPA Efforts Help

Issues

- Traditional end-user barriers
 - Lack of information
 - Competing vendor claims
 - Split incentives
- State decision-makers
 - Seeking good documentation on clean energy policies, benefits
 - **Must integrate air-energy issues**
- Utility barriers
 - Existing electricity regulations / market rules incentivize supply-side resources
 - View that energy efficiency is not a reliable, cost effective resource
 - Concern that energy efficiency will raise rates
 - Lack of good documentation and education on demand-side programs

EPA Efforts

- Engage end-users, retailers, manufacturers, others in energy efficient products and services
- Support state clean energy actions
 - Document key policies
 - Demonstrate co-benefits
 - Sponsor peer exchange
 - Engage interested PUCs in innovative policies
- Develop tools and policy guidance
- Catalogue best practices
- Foster collaborative efforts



ENERGY STAR is Delivering Results



- Broad national platform for EE
 - Residential
 - products – 50+
 - existing home retrofit
 - new homes
 - Commercial
 - products
 - existing buildings
 - new buildings
- Cost-effective platform for states/utilities
 - Helps lower program administration costs
 - Reduces start-up time
 - Provide valuable lessons learned
 - Provide access to a network of partners
- Partners with key market actors – 8,000 partners
 - Major manufacturers and retailers
 - Builders
 - Utilities / system benefits charge administrators
 - 60% of utility customers
 - 30+ States
- National recognition -- 60% of public

Results thru 2005

- 2 billion products sold
- thousands of buildings
- 1 in 10 new homes
- 4% of electricity avoided
- \$12 billion saved
- 28 GW avoided
- 23 million vehicles worth of GHG emissions

National Action Plan for Energy Efficiency

- **Issue:** Barriers hinder greater investment in cost-effective energy efficiency, cause higher energy costs and more greenhouse gas emissions
- Co-Chairs:
 - Commissioner Marsha Smith, NARUC First Vice President and Member of Idaho Public Utility Commission
 - Jim Rogers, President and CEO of Duke Energy
- **Goal:** To create a sustainable, aggressive national commitment to energy efficiency through gas and electric utilities, utility regulators, and partner organizations
- 50 member Leadership Group making recommendations and taking action.
 - Recognizes that utilities and regulators have critical role
 - Recognizes success requires the joint efforts of customers, utilities, regulators, states, and other partner organizations
 - Will work across their spheres of influence to remove barriers
 - Commits to take action within their own organization to increase attention and investment in energy efficiency
- DOE and EPA facilitated



National Action Plan for Energy Efficiency

-- *Recommendations*

- Recognize energy efficiency as a high-priority energy resource.
- Make a strong, long-term commitment to implement cost-effective energy efficiency as a resource.
- Broadly communicate the benefits of and opportunities for energy efficiency.
- Provide sufficient, timely and stable program funding to deliver energy efficiency where cost-effective.
- Modify policies to align utility incentives with the delivery of cost-effective energy efficiency and modify ratemaking practices to promote energy efficiency investments

National Action Plan for Energy Efficiency -- *Where Are We Now?*

- Commitments by Leadership Group and Others
 - 84+ organizations across 47 states made 62 public statements and commitments to advance energy efficiency as part of a national press roll-out of NAPEE on July 31, 2006
- Year Two
 - Assist organizations in delivering on commitments & engage more organizations in making commitments
 - Sector collaboratives
 - Regional implementation workshops
 - Develop new materials to support implementation of the Action Plan recommendations
 - Address throughput incentive, effective planning and procurement practices, M&V, and other issues
 - Monitor commitments and report on progress

The Clean Energy-Environment State Partnership



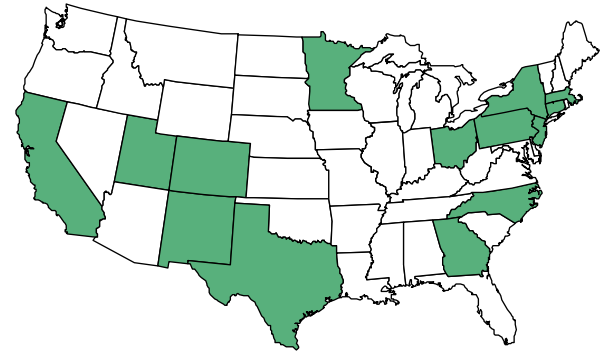
A voluntary state-federal partnership with leading states to advance clean energy policies that achieve economic, public health, and environmental goals

Partners take action:

- Foster collaboration among state agencies
- Establish 1 or more clean energy goals
- Conduct analyses, evaluate options and measure benefits
- Develop and implement clean energy-environment action plan

EPA provides:

- Dedicated, hands-on assistance evaluating strategic and programmatic options
- Targeted guidance and analysis
- State-to-state peer exchange and communication support
- Information about funding opportunities and related clean energy resources
- National recognition



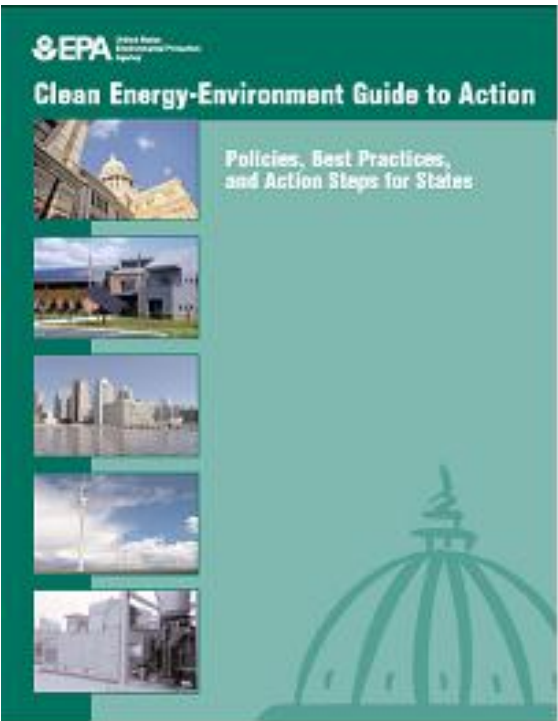
Participating States (15):
CA, CO, CT, GA, HI, MA, MN, NC,
NJ, NM, NY, OH, PA, TX, UT

Together, EPA's Partner States Represent...

- 52% of U.S. population
- 48% of U.S. energy consumption
 - 6 of 10 highest energy consuming states
- 55% of total U.S. GSP
- 46% of total U.S. CO₂ emissions from fossil fuel combustion

EPA Clean Energy-Environment Guide to Action

Policy	EE	RE	DG/ CHP
State Planning and Incentive Structures			
Lead by Example	X	X	X
State and Regional Energy Planning	X	X	X
Determining the AQ Benefits of Clean Energy	X	X	X
Funding and Incentives	X	X	X
Energy Efficiency Actions			
Energy Efficiency Portfolio Standards	X		
Public Benefit Funds for Energy Efficiency	X		
Building Codes for Energy Efficiency	X		
State Appliance Standards	X		
Renewable Energy and Combined Heat and Power			
Renewable Portfolio Standards		X	X
Public Benefit Funds for Clean Energy Supply		X	X
Output-Based Environmental Regulations		X	X
Interconnection Standards		X	X
Fostering Green Power Markets		X	X
Utility Planning and Incentive Structures			
Portfolio Management Strategies	X	X	X
Utility Incentives for Demand-Side Resources	X	X	X
Emerging Approaches: Removing Rate Barriers to Distributed Generation		X	X



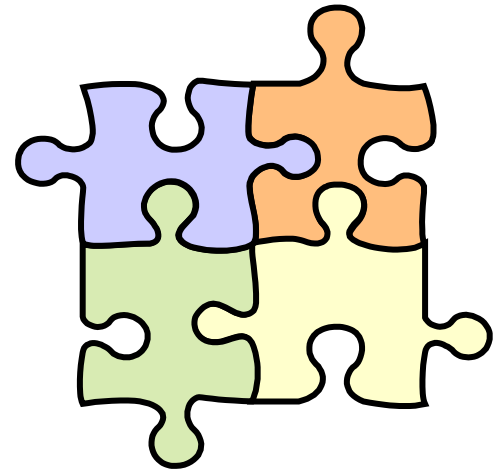
Full toolkit includes additional guidance, measurement, modeling and tracking tools

Big Opportunity to Connect Energy Efficiency to Peak Ozone Reduction Needs

FROM THE OTC...

**“THE MOST PROMISING
COST EFFECTIVE
ENVIRONMENTAL SOLUTIONS
WILL COME FROM.....**

**ENERGY EFFICIENCY
AND UNDERSTANDING
REGIONAL AND EXTRA
REGIONAL
ENERGY CHALLENGES”**



EPA Modeling Inputs for OTC HEDD

<i>2010</i> <i>Measures beginning in 2008</i>	Low	Medium	High
Energy Efficiency (EE)	1% cumulative reduction in load (1,083 MW at peak)	1.5% cumulative reduction in load (1,624 MW at peak)	2.0% cumulative reduction in load (2,166 MW at peak)
Demand Response (DR)	3% reduction at peak hours (3,216 MW at peak)	4% reduction at peak hours (4,266 MW at peak)	5% reduction at peak hours (5,306 MW at peak)
Solar PV, installed capacity	56 MW	112 MW	168 MW
Clean Distributed Generation (DG) in CHP mode, installed capacity	771 MW	1,884 MW	2,975 MW

EPA Modeling Inputs for OTC HEDD

2015 <i>Measures beginning in 2008</i>	Low	Medium	High
Energy Efficiency (EE)	3.5% cumulative reduction in load (3,958 MW at peak)	5.25% cumulative reduction in load (5,937 MW at peak)	7.0% cumulative reduction in load (7,917 MW at peak)
Demand Response (DR)	4% reduction at peak hours (4,365 MW at peak)	5.5% reduction at peak hours (5,894 MW at peak)	7% reduction at peak hours (7,362 MW at peak)
Solar PV, installed capacity	169 MW	339 MW	508 MW
Clean Distributed Generation (DG) in CHP mode, installed capacity	2,067 MW	4,617 MW	6,627 MW

Results: NOx Emissions in Entire Region (2010 and 2015) – also GHG benefits

Daily NOx reduced from <u>All</u> Units	Low	Medium	High
Tons	29	46	64
Percent of total	-3.6%	-5.7%	-7.8%

Daily NOx reduced from <u>All</u> Units	Low	Medium	High
Tons	94	136	167
Percent of total	-13.2%	19.0%	-23.3%

Daily NOx Decrease from Capped Units

<u>LO</u>	<u>MED</u>	<u>HI</u>
65	96	127

Daily NOx Decrease from Capped Units

<u>LO</u>	<u>MED</u>	<u>HI</u>
129	185	230

Daily NOx Increase from Back Up Generation

<u>LO</u>	<u>MED</u>	<u>HI</u>
42	55	68

Daily NOx Increase from Back Up Generation

<u>LO</u>	<u>MED</u>	<u>HI</u>
43	57	72

Analysis Linked to “Best Practices”

EPA Estimates of Potential Reductions OTC-Wide (“Medium” Level of Effort Scenarios)	Examples of Related Best Practices
<p><u>Energy Efficiency</u> 1.5 % reduction in total load by 2010; 5.25% by 2015 1,624 MW demand reduction at peak by 2010; 5,937 MW by 2015 24.7 tons NOX per day peak reduction in 2010</p>	<ul style="list-style-type: none"> ▪ ENERGY STAR Qualified Homes ▪ Home Performance with ENERGY STAR ▪ ENERGY STAR HVAC Proper Installation ▪ Enhanced Commercial Building Energy Efficiency (retro-commissioning, enhanced lighting and comprehensive retrofit programs) ▪ Cool Roofs
<p><u>Combined Heat and Power</u> 1,884 MW installed capacity by 2010; 4,617 MW by 2015 27.5 tons NOX per day peak reduction in 2010</p>	<ul style="list-style-type: none"> ▪ Standby Rates ▪ Interconnection Standards ▪ Congestion Requests for Proposals
<p><u>Solar Energy</u> 112 MW installed capacity by 2010; 339 MW by 2015 .07 tons NOX per day peak reduction in 2010</p>	<ul style="list-style-type: none"> ▪ Solar PV Incentive Programs
<p><u>Demand Response</u> 4% reduction at peak hours by 2010; 5.5% by 2015 4,266 MW demand reduction at peak in 2010; 5,894 in 2015 9.6 tons NOx per day peak increase in 2010 (assumes emissions decreases from curtailment and load shifting offset by emissions increases from back up generators)</p>	<ul style="list-style-type: none"> ▪ Demand Response -- Time Based Rates ▪ Demand Response – Incentive Programs

Bottom-Line

- Many reasons to pursue more energy efficiency
 - Environmental
 - Economic
 - Energy
- Look at removing barriers and providing incentives
- Include robust measurement and verification plans
- Think big, and go from there

For More Information and Assistance



www.energystar.gov

<http://www.epa.gov/cleanenergy/>