Updates and Priorities

EPA's Clean Energy Strategies for Cleaner Air

Beth Craig, Acting Director
Office of Atmospheric Programs
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Topics

- **Clean Energy Strategies for Cleaner Air**
  - Key Power Sector Air Regulations
    - Cross-State Air Pollution Rule (CSAPR)
    - Mercury and Air Toxics Standards (MATS)
  - Integrating Clean Energy Strategies into Regulatory Programs
    - MATS Energy Efficiency (EE) Policy Scenario
    - Incorporating Clean Energy into State Implementation Plans (SIPs)
- **ENERGY STAR Updates: Supporting State EE Policies & Programs**
  - Qualified Products
  - Residential
  - Commercial and Industrial
- **Other Clean Energy Strategies at EPA**
  - State and Local Energy Efficiency Action Network
  - CHP Partnership and Green Power Partnerships

- Additional Slides: Detail on Power Sector Air Regulations: CSAPR & MATS

EPA's Clean Energy Strategies for Cleaner Air

- EPA's regulatory agenda – reducing emissions from power plants; cleaning the air while growing the economy
- Employing EE as multiple benefits strategy to lower cost & enhance reliability
- Adding energy efficiency (EE) to the compliance toolbox
  - Cross-State Air Pollution Rule (reduces SO_2 and NO_X from power plants in the eastern half of the United States)
    - Finalized July 2011
    - Solicited ideas for supporting EE (proposed rule)
    - Final rule supports States' inclusion of EE allowance set-asides for SIPs
  - Mercury and Air Toxics Standards (reduces toxic emissions from power plants across the United States)
    - Proposed March 2011; to be finalized November 2011
    - EE Policy Scenario highlights benefits (cost, emissions, reliability) of state/federal EE policies
  - SIP approaches – developing approaches to use CE (EE & RE) in SIPs
    - Incorporating CE policies into emissions forecasts – state-by-state analyses that can be reflected in emission baselines
    - More to come – seizing opportunities to add CE policies into air compliance toolbox
- **State Energy Offices play critical role in supporting Air Offices' efforts to leverage clean energy in their regulatory programs**

Key Power Sector Air Regulations

- Cross-State Air Pollution Rule (CSAPR)
- Mercury and Air Toxics Standards (MATS)

See Appendix for additional detail on these regulations

Overview of the Cross-State Air Pollution Rule (CSAPR)

- Finalized July 2011
- Authorized under the “good neighbor” provision of the Clean Air Act to reduce emissions of SO_2 and NO_X from power plants in the eastern U.S.
- Will reduce fine particle and ozone air pollution, saving lives, preventing illnesses, creating jobs, and protecting American communities
- Through an allowance trading approach will level the playing field by requiring under-controlled power plants to make long-overdue investments in proven, readily-available pollution control technologies already in place at many power plants across the U.S.
- The $800 million spent annually on this rule in 2014, along with the roughly $1.6 billion per year in capital investments already under way as a result of CAIR, are improving air quality for over 240 million Americans and will result in $120 to $280 billion in annual benefits.

Overview of the Mercury and Air Toxics Standards (MATS)

- Proposed March 16, 2011
- National standards to reduce toxic air pollutants from new and existing coal- and oil-fired power plants
- Affects 1,350 Coal- and Oil-Fired Units at 525 Power Plants across the U.S.
- Standards would reduce emissions of:
  - Metals, including mercury (Hg), arsenic (As), chromium (Cr), and nickel (Ni)
  - Acid gases, including hydrogen chloride (HCl) and hydrogen fluoride (HF)
  - Particulate matter
- Will result in additional reductions of SO_2 emissions, preventing thousands of deaths and hundreds of thousands of illnesses each year.
- Creates uniform emissions-control requirements based on proven, currently in-use technologies and processes
- Compliance time line set by Clean Air Act: up to 4 years (3 years plus an additional year if granted by the permitting authority)

Clean Energy Strategies

- MATS Energy Efficiency (EE) Policy Scenario
- Incorporating Clean Energy into State Implementation Plans (SIPs)

Mercury and Air Toxics Standards (MATS): EE Policy Scenario

- For MATS proposal (March 2011) EPA developed scenario to illustrate impacts of integrating end-use energy efficiency (EE) policies within states' compliance strategies
  - "EE sensitivity" based upon two key drivers of future EE investments
    - Ratepayer-funded EE programs (state policy driven)
    - Federal appliance standards (DOE rulemakings required by current statutes)
  - Represents significant reductions in US electricity demand (5.3% in 2020 and 6.6% in 2030)
  - Modeled power sector impacts using IPM and combined with estimates of EE costs
- Positive results
  - Economic benefits
    - Reduces costs of MATS
    - Reduces electricity and natural gas prices
  - Reliability benefits
    - Reduces required new generation
    - Reduces required new emissions controls
  - Reduces air emissions of NOx, SO2, Hg, and CO2
- Key takeaways
  - Leveraging end-use EE investments will reduce costs and help achieve timely compliance
  - EPA encourages state agencies, power companies, regional grid operators and other key participants to engage in early planning to ensure orderly and affordable compliance including consideration of the contribution that EE policies can make

Incorporating Clean Energy (EE & RE) Into State Implementation Plans (SIPs)

- Roadmap for Incorporating EE/RE Policies/Programs in State Implementation Plans (SIPs) (March 2011 Draft)
  - http://www.epa.gov/airquality/eere.html
  - Updated version expected in early Fall 2011
- EE/RE policy analysis of existing state policies currently not incorporated in EPA's baseline forecasts
  - Help states incorporate existing EE/RE policies into SIP baseline emission forecasts
  - Existing state EE policies reduce demand ~ 3% by 2020
  - http://www.epa.gov/statelocalclimate/state/statepolicies.html
- Technical assistance:
  - Conducting EGU modeling using the Integrated Planning Model (IPM) and making results available to States for use in SIPs
- Bridging information gaps
  - Identify cost-effective strategies to meet clean air requirements
  - Communicate tangible benefits to Air and Energy Regulators
  - Developing training modules to address key issues

ENERGY STAR Updates: Supporting State EE Policies & Programs

- Qualified Products
- Residential
- Commercial and Industrial

ENERGY STAR Qualified Products

Enhanced Qualification and Verification

- Third-Party Certification of ENERGY STAR products effective January 1, 2011
- Before a product can be labeled with the ENERGY STAR, performance must be certified by an EPA-recognized third-party based on testing in an EPA-recognized lab
- ENERGY STAR manufacturers must participate in verification testing programs run by the Certification Bodies (CBs)
- As hoped, market response in terms of labs and certifiers stepping up to provide the necessary services has been tremendous. EPA has recognized
  - 26 Accreditation Bodies
  - 305 Labs
  - 20 CBs
- To date, over 17,000 qualified products have been certified by or registered with CBs

ENERGY STARs ACROSS AMERICA

- Event series launched on April 21, 2011 to celebrate Earth Day
- Over 750 events on the map
- Over 60 partners participating including state supporters like Delaware Sustainable Energy Utility, the State of Hawaii Energy Office and the City of Topeka, Kansas
- Events range from state fairs to flash mobs, all with energy efficiency at its core
- Event series to end for 2011 on October 31st

Most Efficient

- New initiative to identify the most efficient ENERGY STAR products for early adopters to drive more energy efficient products into the market more quickly
- Challenge—do not confuse consumers or harm the ENERGY STAR brand
- Have worked with stakeholders and consumers over the past year on program structure and recognition levels
- In 2011—pilot effort for clothes washers, TVs, refrigerators, central air conditioners, and heating equipment

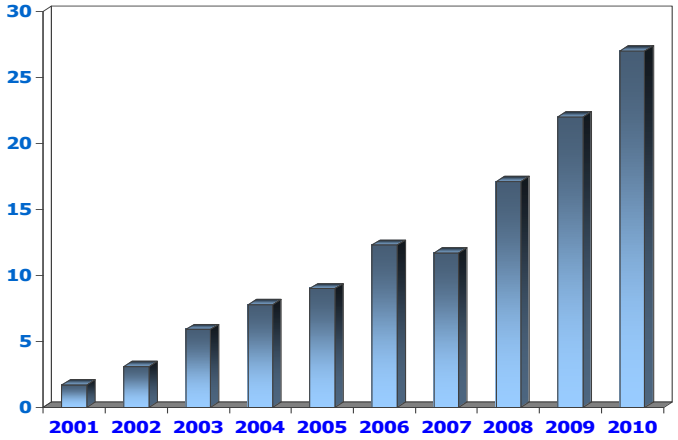
ENERGY STAR Residential

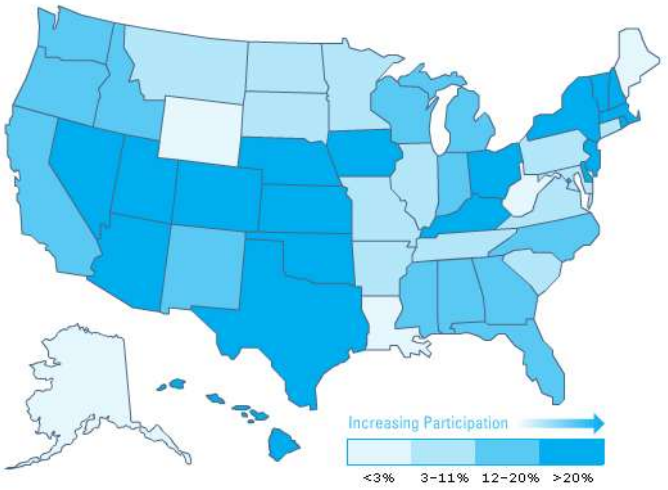
ENERGY STAR Homes Program

- **25% national market share for ENERGY STAR Qualified New Homes in 2010**
  - Up from 21% in 2009, despite decline in overall housing market
  - 16 states had market share >25% in 2010

- **ENERGY STAR Home Assessment Tools (2010 Metrics):**
  - 95,000 consumers used EPA's Home Energy Yardstick to compare their homes' energy use to others across the country
  - Over 55,000 homeowners used ENERGY STAR Home Advisor for customized recommendations to improve energy efficiency
  - More than 1 million visitors to the ENERGY STAR Home Improvement web site

Market Share for ENERGY STAR Qualified New Homes Over Time





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ENERGY STAR Qualified New Home Program

- **New Specification (aka Version 3.0)**
  - Currently transitioning program to new and more rigorous requirements for homes to earn the ENERGY STAR label
  - Homes built to the new requirements will be at least 15 percent more energy efficient than those built to the 2009 IECC
    - Also include additional features to give a performance edge of 20-30 percent compared to typical new homes
    - Even greater savings when compared to re-sale homes on the market today
  - New requirements phased in starting April 1, 2011; fully enforced in 2012
  - Adopts a building science, systems-based approach focusing on:
    - Thermal Enclosure Systems
    - Heating and Cooling Systems
    - Water Management Systems
    - Energy efficient lighting and appliances
    - More rigorous quality assurance through comprehensive inspection checklists
  - Key Consumer Benefits: Lower utility bills, enhanced comfort, improved indoor air quality, increased home quality and durability

ENERGY STAR Existing Home Program

- **Home Performance with ENERGY STAR (HPwES)**
  - Responsibility for implementing whole-house retrofit program transitioning to Department of Energy (DOE)
  - Goal is to consolidate Federal activities to achieve greater program efficiencies
    - Whole-house program complements other DOE activities, such as Home Energy Score, Better Buildings grants, Building America Research program
  - Program officially transitions to DOE on Oct 1, 2011; ongoing EPA support through 2012
  - Extensive, ongoing coordination with stakeholders to ensure smooth transition

States Sponsor ENERGY STAR Residential Programs

- **New Homes marketplace**:
  - Marketing and promotional support for participating builders
  - Offering strategic incentives for builders and/or home buyers
  - Technical training for builders, subcontractors, Home Energy Raters
  - Coordinating local 'ENERGY STAR Summits' for partners and stakeholders
  - Quality assurance of qualified homes
  - Measurement and evaluation of program savings and effects
- **Key examples include**: Colorado Governor's Energy Office, Georgia Environmental Finance Authority, New Jersey BPU, NYSERDA, Energy Trust of Oregon, Northwest Energy Efficiency Alliance

- **Existing Home Improvement marketplace**:
  - Contractor recruitment, training, and certification
  - Marketing and program promotion
  - Providing incentives to participating contractors and home owners
  - Conducting quality assurance to ensure that work meets program standards
  - Measurement and evaluation of program savings and effects

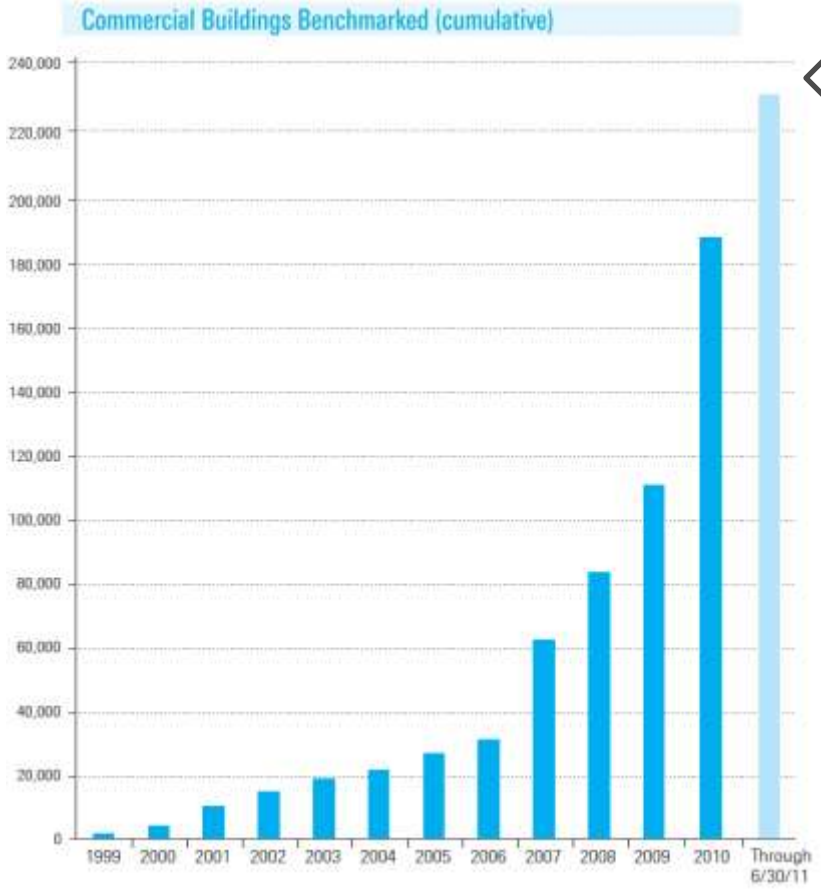
- **Key examples include**: Illinois Energy Office, Maryland Energy Administration, New Jersey BPU, NYSERDA, Utah Energy Office, and Delaware (via Division of Clean Energy and Climate)

ENERGY STAR Commercial

Leverage ENERGY STAR to Advance Commercial Building Energy Efficiency

- Access flexible tools and resources and meet your state's energy efficiency goals
- Leverage ENERGY STAR brand recognition and market penetration to reach your target markets
- Utilize ENERGY STAR Portfolio Manager
  - Standardized whole building performance metrics
  - Training, tech support available from EPA
  - Many options for data sharing, reporting and customization
  - Foundation for tracking results and awarding recognition

Benchmarking Activity in Portfolio Manager Continues to Increase



Over **230,000** buildings benchmarked

Over **14,000** buildings certified as ENERGY STAR

EPA

Advance Energy Efficiency to Your Target Markets through Policy and Legislation

Jurisdiction	Enacted	Public Buildings	Private Buildings	Disclosure	Utility Requirement
Michigan	April 05	√			
Ohio	Jan 07	√			
Hawaii	July 09	√			
Denver, CO	Oct 07	√			
California	Oct 07	√	√	Transactional	√
Washington	May 09	√	√	Transactional	√
D.C.	July 08	√	√	Annual	
New York, NY	Dec 09	√	√	Annual	
Seattle, WA	Jan 10	√	√	Transactional	√
Austin, TX	June 11	√	√	Transactional	
San Francisco, CA	Feb 11	√	√	Annual	
MD (pending)		√	√	Transactional	
CO (pending)			√	Transactional	√

Advance Energy Efficiency to Your Target Markets through Voluntary Programs

- Promote energy efficiency to building owners throughout your state.
- Leverage the ENERGY STAR brand: recognized by over 80 percent of American households.
- Utilize EPA resources:
  - Portfolio Manager
  - Energy management training and college curriculum
  - Toolkits for energy awareness and tenant engagement toolkits
  - ENERGY STAR Recognition

Green Office Challenge HOUSTON

KILOWATT CRACKDOWN LOUISVILLE

WATTS TO WATER
TAP THE POWER

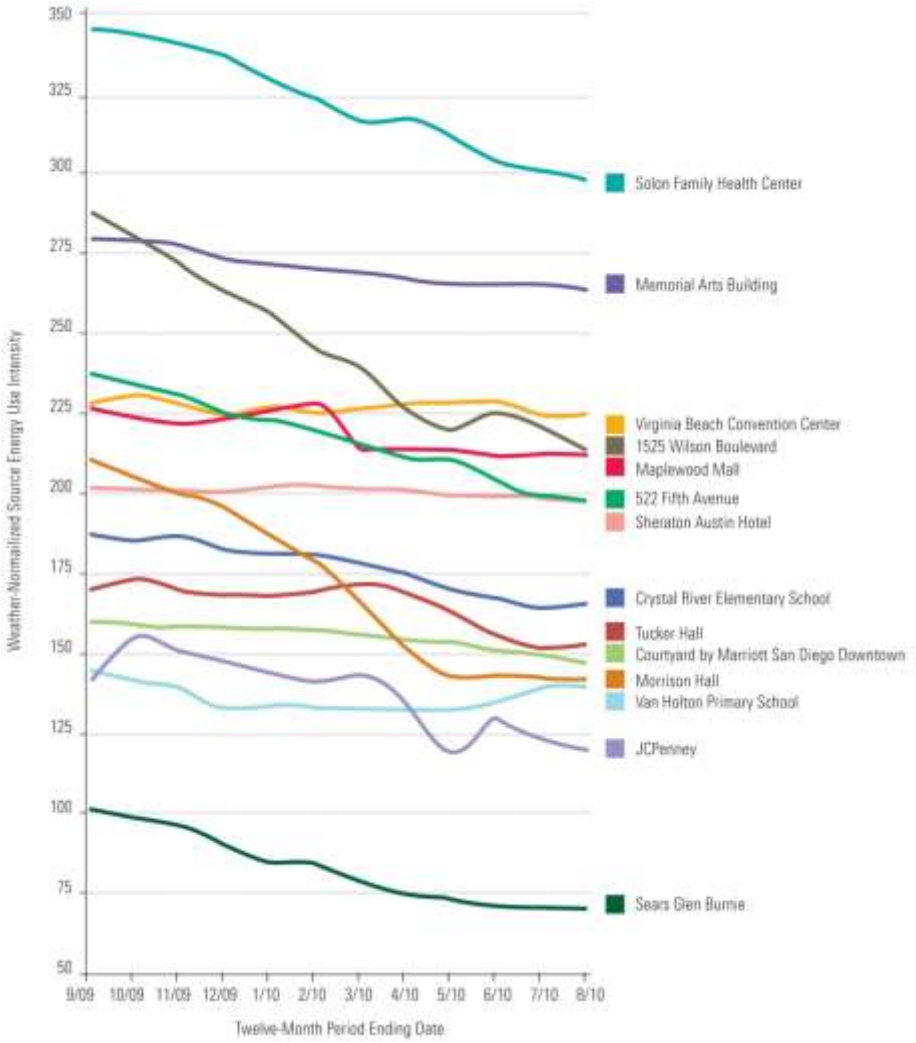
Chicago Green Office Challenge

ARLINGTON GREEN GAMES

THE BOMA SEATTLE | KING COUNTY
KILOWATT CRACKDOWN

EPA's National Building Competition: A great model for states!

2010



2011

- 245 buildings from 34 states
- State-owned buildings are competing! (Haslet Armory, Delaware and the Hawaii State Capitol Building)
- EPA will announce the winner and top category finishers on November 2
- More info at, including the top contenders as of the midpoint, at www.energystar.gov/BattleOfTheBuildings

BATTLE OF THE BUILDINGS
EPA's NATIONAL BUILDING COMPETITION

ENERGY STAR Portfolio Manager Upgrade Underway to Meet Demand

- Overall Look/Feel
  - Make it simple
  - Should not need a training to enter data

→"Make it more like Turbo Tax!"

- Reporting
  - Incorporate more graphics
  - Easy export for reporting outside of the tool

→ "Make it more like Mint/my banking!"

- Sharing
  - Facilitate sharing among users
  - Support competitions/campaigns
  - Enable easy to use customizable sharing controls

→"Make it more like Facebook/LinkedIn!"

Other Clean Energy Strategies at EPA

- State and Local Energy Efficiency Action Network
- Combined Heat and Power (CHP) and Green Power Partnerships

SEE Action

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

ENERGY STAR

- EPA continues co-sponsorship (with DOE) of State and Local Energy Efficiency Action Network (SEE Action)
  - Executive Group Co-Chair
  - Staff on all Working Groups and Measuring Progress
- Focus: Assistance to state and local governments in their implementation of energy efficiency policies and programs
- Update: All 8 issue-focused Blueprints/Roadmaps now available at www.seeaction.energy.gov
- NASEO has a critical role

EPA

- **Combined Heat & Power Partnership**
  - CHP is a key supply-side energy efficiency resource
  - CHP Partnership supports development of new CHP projects
    - Over 400 Partners
    - 5,100 MW of new capacity since 2002
  - Working to recognize CHP's pollution-prevention benefits in federal air regulations

- **Green Power Partnership**
  - Seeks to increase the use of green power among leading U.S. organizations
    - Serves as advocate for solar purchase power agreements, RECs, utility products
  - Partners purchase green power in amounts that must meet or exceed EPA benchmarks and in return receive technical assistance and recognition
  - Currently has more than 1,300 Partners, including Fortune 500 companies, states, federal agencies, local governments, and colleges and universities

Summary: Growing Momentum

- EPA is integrating clean energy into our clean air regulatory programs
  - Provides States the opportunity to leverage clean energy policies & programs to meet clean air goals
- EPA supports state clean energy policies and programs through a portfolio of partnerships
  - Sharing models of success, enhancing ENERGY STAR offerings
- EPA-State partnership is key to success in both these areas
- Continue close coordination with DOE

Additional Slides

Detail on EPA's Key Power Sector Air Regulations:

CSAPR and MATS

EPA Activity on Power Sector Air Regulations

- There has always been the need to manage all types of power generation in ways to mitigate public health and environmental concerns
- EPA has recently proposed rules in various environmental media covering fossil generation
- EPA's Air Office finalized the Cross-State Air Pollution Rule (CSAPR) in July and proposed Mercury and Air Toxic Standards (MATS) in March 2011

Overview of the Cross-State Air Pollution Rule (CSAPR)

- EPA finalized the Cross-State Air Pollution Rule under the "good neighbor" provision of the Clean Air Act to reduce emissions of SO_2 and NO_X from power plants in the eastern half of the United States
- The Cross-State Air Pollution Rule will reduce fine particle and ozone air pollution, saving lives, preventing illnesses, creating jobs, and protecting American communities
- It will level the playing field by requiring under-controlled power plants to make long-overdue investments in proven, readily-available pollution control technologies already in place at many power plants across the country
- The $800 million spent annually on this rule in 2014, along with the roughly $1.6 billion per year in capital investments already under way as a result of CAIR, are improving air quality for over 240 million Americans and will result in $120 to $280 billion in annual benefits.
- The Cross-State Air Pollution Rule puts in place a new framework to address pollution that affects air quality in downwind states:
  - Helps states meet air quality standards as quickly as possible.
  - Similar to previous allowance trading programs, the Cross-State Air Pollution Rule encourages innovation and cost-savings and helps power plants achieve their mission of providing clean, affordable, and reliable energy now for the future.

Key Elements of the Cross-State Air Pollution Rule

- The rule defines upwind state obligations to reduce pollution significantly contributing to downwind nonattainment and maintenance areas based on:
  - the magnitude of a state's contribution,
  - the cost of controlling pollution from various sources, and
  - the air quality impacts of reductions.
- Once these obligations are determined, including the amount of necessary pollution reductions, state budgets are set accordingly.
- State budgets are set with variability limits to assure that each state will meet its pollution control obligations.
- EPA carefully considered the court's direction in correcting CAIR's flaws.
- The rule allows air quality-assured allowance trading among power plants, utilizing an allowance market infrastructure based on existing, successful allowance trading programs.

Achieving Compliance Under the Cross-State Air Pollution Rule

- To meet the requirements of this rule, EPA anticipates power plants will:
  - Maximize use of installed SO_2 and NO_X pollution control equipment, including running clean units more than would otherwise occur;
  - Use lower sulfur coal, switch fuels; or
  - Install or upgrade pollution control equipment, such as low NO_X burners or scrubbers (Flue Gas Desulfurization).
- CAIR will be implemented through 2011 compliance periods – CAIR then will be replaced by the Cross-State Air Pollution Rule.

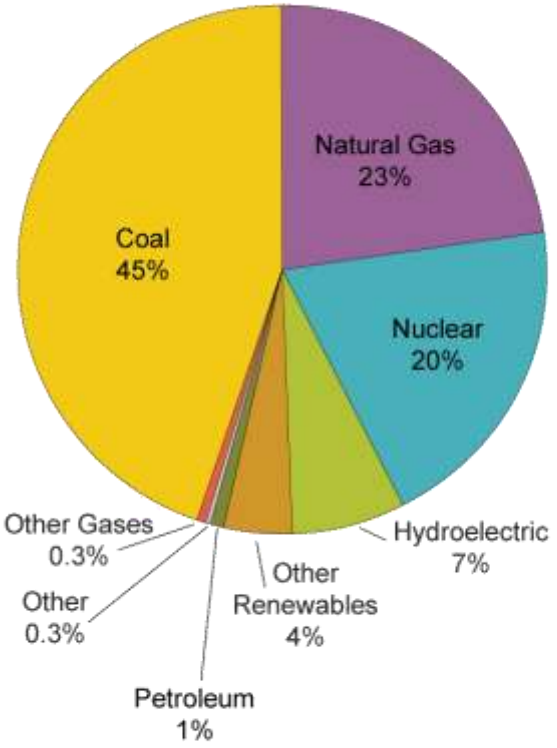
Overview of the Mercury and Air Toxics Standards (MATS)

- On March 16, the Administrator signed the proposed National Emissions Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Utilities, the first national standards to reduce emissions of toxic air pollutants from new and existing coal- and oil-fired power plants – often the biggest contributors to air pollution.
- Standards would reduce emissions of:
  - Metals, including mercury (Hg), arsenic (As), chromium (Cr), and nickel (Ni)
  - Acid gases, including hydrogen chloride (HCl) and hydrogen fluoride (HF)
  - Particulate matter
- The standards would also result in additional reductions of SO_2 emissions, which, by reducing ambient SO_2 and particle levels, will prevent thousands of deaths and hundreds of thousands of illnesses each year.
- Standards create uniform emissions-control requirements based on proven, currently in-use technologies and processes
- Compliance time line set by Clean Air Act: up to 4 years (3 years plus an additional year if granted by the permitting authority)
- EPA is also proposing a new source performance standard (NSPS) for particulate matter, sulfur dioxide (SO_2), and nitrogen oxide (NO_X) emissions from new sources

Affected Facilities: 1,350 Coal and Oil-Fired Units at 525 Power Plants

- Approximately 1,200 coal-fired units
  - 45% percent of nationwide electricity generation
    - Bituminous coal ~ 50% of coal generation
    - Subbituminous ~45% of coal generation
    - Lignite ~ 5% of coal generation
  - Includes units that burn coal, coal refuse, a synthetic gas derived from coal, or solid oil-derived fuel (e.g., petroleum coke) either exclusively, in any combination together, or in any combination with other supplemental fuels that are not solid wastes
- Approximately 150 oil-fired units
  - 1% of nationwide electricity generation
- Natural gas power plants are not affected by this rule
- EPA expects most facilities would install technologies to comply with this rule

U.S. Electric Power Industry Net Generation by Fuel, 2009



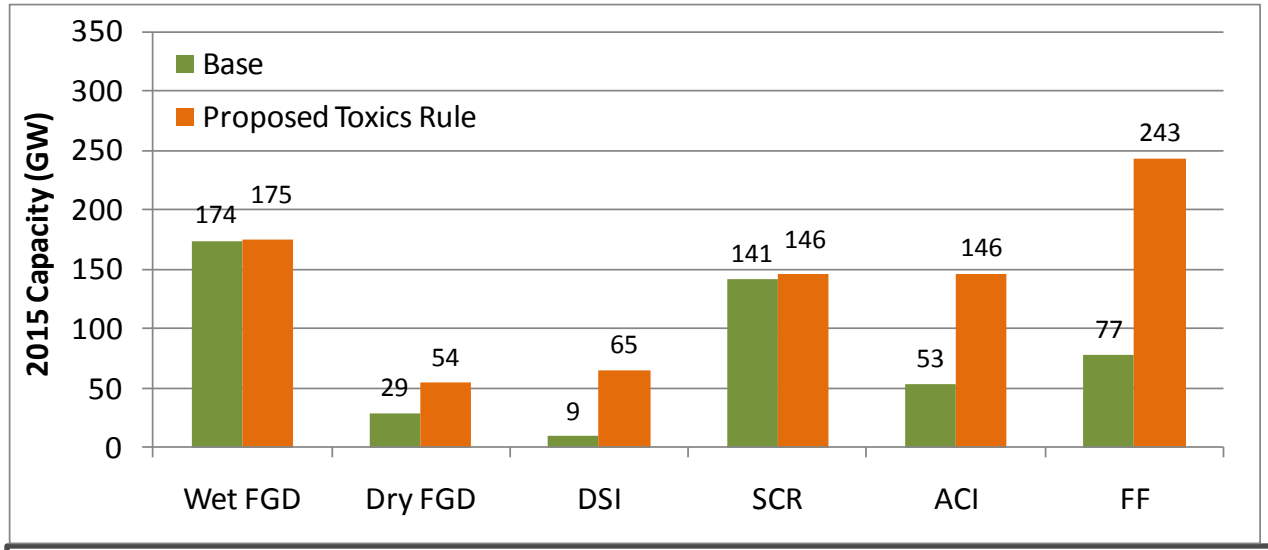
Source: U.S. Energy Information Administration, *Annual Energy Review 2009* (August 2010).

What the Mercury and Air Toxics Standards Propose

- Coal- and oil-fired power plants are covered by this rule.
- All hazardous air pollutants must have standards.
- EPA must set emission standards for existing sources in the category that are at least as stringent as the emission reductions achieved by the average of the top 12% best controlled sources for source categories with 30 or more sources.
- Emissions averaging within a contiguous facility is allowed in certain circumstances.
- Requirements for Coal-fired Units
  - Mercury:
    numeric emission limit would prevent 91% of mercury in coal from being released to the air
  - Acid Gases:
    HCl numeric emission limit as a surrogate, with an alternate surrogate of SO_2
  - Non-mercury metallic pollutants:
    (e.g., arsenic, chromium): numeric emission limit for total PM as a surrogate, with an alternate surrogate of total metal air toxics
  - Organic air toxics (including dioxin/furans):
    work practice standards, instead of numeric emission limits, due to low-detected emission levels in the ICR data. Would ensure optimal combustion preventing dioxin/furan emissions
- Requirements for Oil-fired Units
  - Acid Gases:
    HCl and HF numerical emission limits
  - Metal Air Toxics:
    numerical emission limits for total metal air toxics (including mercury) with individual metal air toxic numerical limits as an alternate
  - Organic air toxics (including dioxin/furans):
    work practice standards, instead of numeric emission limits, due to low-detected emission levels in the ICR data. Would ensure optimal combustion preventing dioxin/furan emissions

Sources Can Achieve These Standards

- Proven control technologies to reduce these emissions such as scrubbers, fabric filters, and activated carbon injection are widely available
- Many units already use one or more of these technologies
- As a result of this standard, some power plants will upgrade existing controls (especially particulate matter controls like electrostatic precipitators)
- Power plants may also install new controls (such as fabric filters, dry sorbent injection, or activated carbon injection)



Retrofit pollution control installations on coal-fired capacity (by technology) with the base case and with the proposed Toxics Rule, 2015 (measured in GW capacity). Source: Integrated Planning Model run by EPA, 2011

FGD: flue gas desulfurization (scrubber)
DSI: dry sorbent injection
SCR: selective catalytic reduction
ACI: activated carbon injection
FF: fabric filter

FGD – 96% SO_2 removal; 99% HCl removal
DSI – 70% SO_2 removal; 90% HCl removal
SCR – 80% NO_x removal
ACI – 90% Hg removal
FF – PM control

FOR MORE INFORMATION:

For the Cross-State Air Pollution Rule

http://epa.gov/crossstaterule/

For Mercury and Air Toxics Standards

http://www.epa.gov/airquality/powerplanttoxics/