# INDIANA'S NEW AIR QUALITY RULES FOR UTILITIES

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# CLEAN AIR INTERSTATE RULE (CAIR)

- Federal rule to reduce transported pollution from power plants; assist with ozone/$PM_{2.5}$ attainment
- Applies in 28 states, including Indiana
- Establishes three cap and trade programs for NOx and SO2; reductions in 2 phases (2009/2010 and 2015)
- Annual SO2 program builds on existing Acid Rain trading program
- Ozone season NOx program builds on existing NOx SIP Call trading program
- Adds new annual NOx trading program

# CAIR NATIONAL BENEFITS

- In 2010, CAIR will reduce SO2 emissions by 4.3 million tons -- 45% lower than 2003 levels, across states covered by the rule. By 2015, CAIR will reduce SO2 emissions by 5.4 million tons, or 57%, from 2003 levels in these states. At full implementation, CAIR will reduce power plant SO2 emissions in affected states to just 2.5 million tons, 73% below 2003 emissions levels.
- In 2009, CAIR will reduce NOx emissions by 1.7 million tons or 53% from 2003 levels. In 2015, CAIR will reduce NOx emissions by 2 million tons, achieving a regional emissions level of 1.3 million tons, a 61% reduction from 2003 levels.
- Will help bring majority of ozone and fine particulate nonattainment areas into compliance

# IN CAIR BENEFITS

- In 2015 CAIR will cap Indiana power plant emissions of sulfur dioxide (SO2) at 178,219 tons annually, a 78% reduction from 2003 emissions

| SO2 | 2003 | 2010 | 2015 |
|---|---|---|---|
| *Emissions Without CAIR (thousand tons) | 805 | 651 | 531 |
| SO2 Caps | N/A | 255 | 178 |

*U.S. EPA IPM runs

# IN CAIR BENEFITS

- In 2015 CAIR will cap Indiana power plant emissions of nitrogen oxides (NOx) at 90,779 tons annually, a 65% reduction from 2003 emissions

| NOx | 2003 | 2009 | 2015 |
|---|---|---|---|
| *Emissions Without CAIR (thousand tons) | 261 | 234 | 233 |
| NOx Caps | N/A | 109 | 91 |

*U.S. EPA IPM runs

# IN CAIR BENEFITS

- Regional air quality modeling to date predicts that CAIR plus other “on the books” controls will bring all Indiana counties into attainment with the ozone and $PM_{2.5}$ standards
- Caveat: current modeling is “SIP quality” for ozone, but not for $PM_{2.5}$

# IDEM'S CAIR RULE: Applicability

- All 3 trading programs: stationary fossil-fueled fired boilers or combustion turbines greater than 25 megawatts producing electricity for sale ("EGUs"); 37 IN sources
- NOx ozone season trading program only: "Large affected unit" meaning industrial boilers with a heat input of greater than 250mmBtus per hour, not producing electricity for sale, and cogeneration units greater than 250mmBtus producing electricity for sale and thermal energy for industrial purposes ("non-EGUs"); 8 IN sources

# CAIR FISCAL ANALYSIS

| | IDEM (Scenario 1) | | | IUG (Scenario 2) | | |
|---|---|---|---|---|---|---|
| **Time interval** | I | II | III | I | II | III |
| Projection years | 2008-2012 | 2013-2017 | 2018-2022 | 2007-2013 | 2014-2017 | 2018-2022 |
| EGUs | | | | | | |
| **Retrofit controls** | | | | | | |
| Description | 3 SO2 scrubbers | 12 SO2 scrubbers; 10SCRs; 2SNCRs | 17 SO2 scrubbers, 10SCRs, 2SNCRs | 11 SO2 scrubbers | 11 SO2 scrubbers; 2 SCRs | 13 SO2 scrubbers; 6 SCRs |
| Capital cost | 413 | 1,493 | 1,853 | 1,492 | 1,689 | 2,296 |
| Annual cost | 95 | 329 | 406 | 292 | 322 | 424 |
| **Total annual cost (includes all costs)** | 571 | 747 | 906 | 815 | 1,021 | 899 |
| **Impact on electricity rates** | **5.16%** | **5.97%** | **6.34%** | **6.44%** | **8.55%** | **7.63%** |
| **Non-EGUs** | | | | | | |
| Annual cost | (5) | (6) | (6) | (5) | (6) | (6) |
| **Net annual cost** | 566 | 741 | 900 | 810 | 1,015 | 893 |

**Note: Retrofit controls and costs in each time interval are cumulative of the previous time interval. Non-EGU costs are negative as revenue is projected from the sale of allowances. SCRs (selective catalytic reduction systems) and SNCRs (selective non-catalytic reduction systems) are post-combustion NOx controls.**

# CAIR: REVISIONS TO IN CLEAN ENERGY CREDIT PROGRAM

- Clean Energy Credit Program (CECP) was created with the Energy Efficiency/Renewable Energy Set-aside allowances established in Indiana's NOx Budget Trading Program ("NOx SIP Call Rule")
- EE/RE Set-aside is "pool" of NOx allowances for EE/RE projects
- One NOx allowance = one ton of NOx emissions
- Grantees sell NOx allowances and use proceeds to fund projects

# Eligible Projects

- Demand side management
- Highly efficient generation
- Renewable energy projects
  - Wind
  - Solar
  - Biomass
  - Methane capture

# Demand Side Management

- Lighting efficiency/control projects
- Building retrofits (insulation improvements, window replacements)
- Process equipment efficiency improvements
- Heating and cooling efficiency improvements
- Reducing fuel usage

# Highly Efficient Generation

- Combined heat and power at least 60% efficient
- Microturbines (>500 kW) at least 40% efficient
- Combined cycle projects > 500 kW at least 50% efficient
- Fuel cell systems at least 40% efficient

# Renewable Energy

- Wind
- Solar
- Biomass combustion
- Methane capture/combustion
  - Sanitary landfills
  - Water or sewage treatment plant
  - Anaerobic digestion - CAFOs

# Examples

- Commercial Building Envelope Retrofit
  - Retailer completes variety of energy efficient retrofits including:
    - Compact fluorescent lighting, energy management systems, energy efficient HVAC/windows and LCD exit signs
  - 4 million kWh saved during the ozone season
  - Energy savings = 3 NOx allowances
  - 3 allowances x $1000 x 5 years = $15,000

# Examples (continued)

- Landfill Methane Generation
  - Landfill captures/compresses methane that fires reciprocating engines driving four 800 kilowatt generators
  - Generators produce 11,750,400 kWh of electricity for distribution to the grid
  - Electricity generated = 9 NOx allowances
  - 9 allowances x $1000 x 5 years = $45,000

# Examples (continued)

- Wind Turbine Project
  - Wind development company installs ten turbines with maximum output of 1.5 MW
  - Turbines generate 40% of maximum capacity and 22,032,000 kWh during the ozone season
  - Electricity generated = 17 allowances
  - 17 allowances x $1000 x 5 years = $85,000

# Examples (continued)

- Combined Heat and Power Project
  - Athletic facility operates two 60 kW microturbines with waste heat used for hot water production and heating two swimming pools
  - Electricity generated and heat used = 1 NOx allowance
  - 1 allowance x $1000 x 5 years = $5000

# Applicant Requirements

- Project sponsor must contact U.S. EPA to establish a general account for holding NOx allowances
- Projects must result in a least one ton of NOx reductions/savings
- Projects may be combined to meet the one ton requirement

# Going forward - CAIR

- Established EE/RE set-aside in annual CAIR program, adding annual allowances to IN Clean Energy Credit Program
- Added categories for projects that use renewable energy for thermal purposes
- Included IGCC as an eligible category
- Divert portion of unallocated allowances to a grant program under the IN Office of Energy and Defense Development to fund smaller (< 1 ton) projects, instead of returning to EGUs/non-EGUs

# CLEAN AIR MERCURY RULE (CAMR)

- U.S. EPA issued this rule on March 15, 2005, to reduce mercury emissions from coal-fired power plants in all states, the largest remaining source of mercury emissions in the country
- CAMR builds on CAIR, establishing a cap and trade program for mercury emissions in two phases, the first of which takes advantage of the co-benefits for mercury control provided by compliance with CAIR Phase I.
- When fully implemented in 2018, these rules will reduce utility emissions of mercury from 48 tons a year to 15 tons, a reduction of nearly 70 percent.

# IN CAMR BENEFITS

- In 2010 CAMR will cap Indiana power plant emissions of mercury at 2.097 tons annually, a 15% reduction from 1999 emissions, and in 2020 at 0.828 tons, a 66% reduction.

| Hg | 1999 | 2010 | 2020 |
|---|---|---|---|
| *Emissions Without CAMR | 2.442 | 1.964 | 2.023 |
| Hg Caps | N/A | 2.097 | 0.828 |

* U.S. EPA IPM runs

# HOOSIER ENVIRONMENTAL COUNCIL (HEC) PETITION

- June 2004: HEC petitioned the Indiana Air Board to adopt a rule requiring a 90% reduction from uncontrolled emissions for power plants
- March 2005: CAMR issued; State Plans due November '06
- October 2006: Air Board requested IDEM work with utilities and HEC to develop rule options between the CAMR and the HEC Petition.
- December 2006: Air Board formed a study group with representatives from utilities, environmental groups, 3 air board members, facilitated by Dr. Bill Beranek, to identify key factors and principles the board should consider in making a decision.

# MERCURY CONTROL TECHNOLOGIES

- CAMR Phase I (2010) cap can be met by utilities installing controls for NOx and SO2 under CAIR ("co-benefits"): FGD, SCR
- CAMR Phase II (2018) cap likely to require direct mercury emission controls such as ACI with Fabric Filter
- HEC 90% rule could require direct mercury controls across-the-board in 2010

# Projected Mercury Control Costs

| CAMR | | |
|---|---|---|
| **Phase I (2010)** | IDEM | IUG |
| Total Annual cost (retrofit controls+ emission monitoring +allowance trading), million $ | -26 | -1 |
| Increase in electricity rates (incremental to CAIR), % | -0.24% | 0.14% |
| **Phase 2 (2018)** | | |
| Total Annual cost (retrofit controls+ emissions monitoring +allowance trading+ additional capacity), million $ | 64 | 68 |
| Increase in electricity rates (incremental to CAIR),% | 0.79% | 1.06% |
| **HEC Petition (beginning 2010)** | | |
| | IDEM | IUG |
| Total Annual cost (retrofit controls+ emissions monitoring), million $ | 207 | 373 |
| Increase in electricity rates (incremental to CAIR), % | 2.80% | 5.00% |

# CAMR RULEMAKING SCHEDULE

- Preliminary Adoption: May 2, 2007
- Final Adoption: October 3, 2007
- October 31, 2007:  state allocation for 2010 due to U.S. EPA if CAMR adopted
- January 2008: state rule final and effective
- January 1, 2010: Phase I CAMR compliance
- January 1, 2018: Phase II CAMR compliance

# “The Climate Registry”: a multi-state GHG registry

- 30 states are in discussion about developing a voluntary greenhouse gas registry, an accounting infrastructure capable of supporting a variety of state-level programs
- IN involved through a grant received by the Lake Michigan Air Directors Consortium to develop a framework for a regional multi-state registry
- LADCO quickly joined with similar efforts in other states
- Proposed startup: 2007; Launch: 2008

# THE CLIMATE REGISTRY: Goals

- Establish a common data infrastructure for voluntary and mandatory reporting programs
- Provide opportunity for reporting entities to establish a baseline and document early action
- Develop nationally recognized platform for credible and consistent reporting requirements
- Promote full and public disclosure of GHG emissions while respecting business confidentiality
- Use best practices in GHG emissions reporting

# THE CLIMATE REGISTRY: Organization

- Nonprofit organization, eventually self-sustaining from reporting member fees
- Board of Directors made up of member states and tribes
- Small executive staff and support staff, plus staff members at LADCO, WRAP, NESCAUM and SESARM
- Technical Workgroups of state/tribe representatives
- Reporting program will build on and subsume the California and Eastern Registries

# THE CLIMATE REGISTRY: Next Steps

- Governors must sign a “Statement of Goals and Principles” to become a member (by April)
- First Board of Directors Meeting May 2007
- Startup activities July-December 2007
- Launch Registry 2008
- IN just received materials, is briefing the governor’s office; no decision yet

# CONTACT INFORMATION

- IN Clean Energy Credit Program: www.IN.gov/idem/energycredit
- CAIR Trading Programs: Roger Letterman, IDEM, 317/232-8342
- CAMR rulemaking: Susan Bem, IDEM, 317/233-5697
- The Climate Registry: Kathy Watson, IDEM, 317/233-5694