

Appendix D

**Final Report of the
Point Source Work Group
of the NOACA Air Quality Public Advisory Task Force
(Ozone)**

NOACA Air Quality Public Advisory Task Force

Point Source Work Group

Final Report – 8-Hour Ozone Options

**“Driving Toward Economic and Environmental
Sustainability for Northeast Ohio”**

March 29, 2006

Contributions to this Report

This Report could not have been compiled without the dedicated assistance of the following, who have all been part of the greater “team.”

Amy Wainright, NOACA
Pamela Davis, NOACA
John Beeker, PhD, NOACA
Bill Davis, NOACA
Mary Wells, NOACA
Bob Dominak, Northeast Ohio Regional Sewer District, Chair
James Apicella, Alcoa
Michelle Duncan, Reliant Energy
Ray Evans, First Energy
Ed Fasko, Ohio EPA - Northeast District Office
David Hearne, City of Cleveland Division of Air Quality
Duane Johnson, Ford Motor Company
Jennifer Karaffa, Cuyahoga County Planning Commission
Bob Laeng, Reliant Energy
Bert Mechenbier, Lake County General Health District
Chris Trepal, Earth Day Coalition
JoAnn Uhlik, Greater Cleveland Partnership
Andrew Watterson, City of Cleveland Office of Sustainability
Rich Zavoda, Mittal Steel
Bill Spires, Ohio EPA
Alan Harness, Ohio EPA
Lee Burkleca, Ohio EPA
Madelyn Harding, Sherwin Williams
Greg Johnson, Sherwin Williams
Mark Cironi, Green Energy Technologies, Inc.
Elaine Barnes, Cleveland Green Building Coalition

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NOACA Air Quality Public Advisory Task Force

Point Source Work Group Final Report – 8-Hour Ozone Options “Driving Toward Economic and Environmental Sustainability for Northeast Ohio” March 29, 2006

I. Executive Summary

The Point Source Work Group of the NOACA Air Quality Public Advisory Task Force reports the following regarding the options for achieving attainment of the 8-Hour Ozone NAAQS in Northeast Ohio:

Possible controls on the following:

- Electric Generating Units (EGUs)
- Industrial/Commercial/Institutional (ICI) boilers
- Asphalt Batch Plants
- Industrial Surface Coatings (Area and Point Sources)
- Cold Cleaners/Degreasing
- Architectural and Industrial Maintenance (AIM) Coatings
- Consumer & Commercial Products
- Auto Body Refinishing (HVLP Spray Guns)
- Gasoline Distribution Facilities (GDFs)
- Glass Manufacturing

In addition, the Work Group studied energy efficiency, including:

- Tapping into grant funding for energy efficiency projects.
- Creating state appliance standards for electric appliances not covered by federal law.
- Having PUCO disallow electric rate increases where there is no renewable energy initiative on the part of the EGU.
- Setting a statewide or nonattainment-area-wide electricity reduction goal of 5%.
- Creating incentives for government entities and businesses to replace electric devices with energy efficient devices.
- Creating incentives for combined heat and power (CHP) projects.
- Encouraging generation of wind power on or near Lake Erie.
- Creating a statewide Model Green Building Code with a LEED Green Building Rating System.

To benefit the business communities as well as to help achieve attainment, the Work Group studied a:

- NOx Credit Trading Bank

Finally, more funding for enforcement of existing air quality laws and regulations, as well as education for business owners and the general public, was considered, as was greater funding for the Ohio Compliance Assistance and Pollution Prevention Office, which reduces air pollution by educating existing permittees, for no fee.

II. Introduction

The NOACA Air Quality Public Advisory Task Force established Work Groups for Mobile Sources, Point Sources, Area Sources, Long-Term Planning, and a Public Health Forum on air pollution. Together, these Work Groups have assisted the Task Force in creating options for recommendations to the Ohio Environmental Protection Agency (Ohio EPA) for inclusion in the State Implementation Plan (SIP) for the new 8-Hour Ozone National Ambient Air Quality Standards (NAAQS). They will continue by assisting with the SIP for the new NAAQS for fine particulates (PM_{2.5}), thus helping Northeast Ohio to come into attainment for these criteria air pollutants.

The Task Force and the Work Groups together will help NOACA to assist the region to protect public health and to comply with federal law.

In addition, they will assist NOACA and Northeast Ohio to plan for future growth, economic viability, and environmental sustainability. The Work Groups have carefully weighed the many advantages and disadvantages of each proposed strategy.

Consequently, this forward-looking document is intended to provide not only creditable SIP measures for Ohio EPA to include, but also “weight of evidence” measures, as described by USEPA’s Phase II Ozone Implementation Rule, to show the good faith of the citizens of Northeast Ohio in moving forward toward clean air and better quality of life.

A. Scope of Work

The Point Source Work Group explored potential emission reduction options for air pollution associated with large sources permitted under Title V of the federal Clean Air Act Amendments of 1990.

It also explored options for smaller industrial, commercial, and residential sources of air pollution, plus miscellaneous sources of air pollution that would otherwise be classified as “area sources” such as consumer products, paints, and gasoline stations.

The Work Group expanded its study to include energy efficiency and conservation, as well as renewable sources of energy, after finding that electricity generation was a heavy contributor to ozone formation in the midwestern United States, including Ohio.

B. Point Source Work Group Membership

The Point Source Work Group is made up of the following members, supplemented by public participants with knowledge and expertise in the areas under study:

Bob Dominak, Northeast Ohio Regional Sewer District, Chair
James Apicella, Alcoa
Michelle Duncan, Reliant Energy

Ray Evans, First Energy
Ed Fasko, Ohio EPA - Northeast District Office
David Hearne, City of Cleveland Division of Air Quality
Duane Johnson, Ford Motor Company
Jennifer Karaffa, Cuyahoga County Planning Commission
Bob Laeng, Reliant Energy
Bert Mechenbier, Lake County General Health District
Chris Trepal, Earth Day Coalition
JoAnn Uhlik, Greater Cleveland Partnership
Andrew Watterson, City of Cleveland Office of Sustainability
Rich Zavoda, Mittal Steel

C. Meetings

The Point Source Work Group met on:

August 30, 2005
September 26, 2005
October 17, 2005
November 15, 2005
January 17, 2006
February 21, 2006

each time at NOACA's offices.

D. Evaluation Criteria

The Work Group began by tracking the work being performed by the Lake Michigan Air Directors' Consortium (LADCO), where Ohio is a member. LADCO subcontracted for studies on various types of point and area sources of air pollution, considering possible emission reduction options for each. The Work Group used its own resources and expertise to add to the list of possible options.

The Work Group also reviewed the Evaluation Criteria established by the full Task Force on July 25, 2005. Those Criteria are as follows:

- Quantifiable
- Enforceable
- VOC Reductions in Tons Per Day
- NOx Reductions in Tons Per Day
- Technically Possible
- Successful Implementation Elsewhere
- Require State Legislation/ State Rules/ Local Ordinances
- Costs Per Ton of Pollutant Removed
- Costs in Other Units
- Economic Investment Required
- Economic Benefit or Detriment

- Health Benefit
- Other Benefits or Detriments
- Behavioral Change Required
- 2009 Timing Requirement
- Long-Term Effect
- Additional Comments or Concerns

Emissions Inventory

The Work Group first reviewed the 2002 Ohio EPA Emissions Inventory for point sources, in which it was found that point sources contributed 30.17% (137.27 tons per day) of the oxides of nitrogen (NOx) in Northeast Ohio that year and 4.37% (17.14 tons per day) of the volatile organic compounds (VOCs) for that year.

The breakdown provided by Ohio EPA is as follows:

Nonattainment Area		
Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, Summit Counties		
2002 NOx Emissions Inventory - Point Sources		
Top 10 Categories		NOx Emissions Tons per day
External Combustion Boilers, Electric Generation		120.44
External Combustion Boilers, Industrial		6.76
Industrial Processes, In-process Fuel Use		2.56
Industrial Processes, Mineral Products		1.64
Industrial Processes, Primary Metal Production		1.07
Internal Combustion Engines, Electric Generation		0.73
External Combustion Boiler, Commercial/Institutional		0.70
Industrial Process, Misc. Manufacturing Industries		0.50
Internal Combustion Engines, Industrial		0.41
Waste Disposal, Solid Waste Disposal – Industrial		0.39

Nonattainment Area		
Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, Summit Counties		
2002 VOC Emissions Inventory - Point Sources		
Top 10 Categories		VOC Emissions Tons per day
Industrial Processes, Mineral Products		5.58
Petroleum & Solvent Evaporation, Surface Coating Operations		4.49
Industrial Processes, Secondary Metal Production		1.70
Industrial Processes, Chemical Manufacturing		0.97
Petroleum & Solvent Evaporation, Printing/Publishing		0.93
Industrial Processes, Rubber & Misc. Plastics Products		0.91

External Combustion Boilers, Electric Generation	0.53
Industrial Processes, Primary Metal Production	0.35
Petroleum & Solvent Evaporation, Organic Solvent Evaporation	0.30
Industrial Processes, Chemical Manufacturing	0.27

Emissions Changes Since 2002

The Work Group reviewed the actual emissions of VOCs and NOx as reported by individual point sources for the years 2003 and 2004. The counties for which data was examined included the 8 counties of Northeast Ohio's nonattainment area, as well as the "collar" counties of Stark, Mahoning, Trumbull, Wayne, Erie, Huron, and Ashland.

Many point sources made changes to their operations since 2002, and many more were slated for changes before 2010, the year in which Northeast Ohio must show attainment of clean air. Ohio EPA has indicated that it may enter these emissions reductions into the airshed model for any point source changes that are actually in place at the time of the final modeling run.

Some of the recent measures taken by point sources in Cuyahoga County included a permit modification by the Ford Casting plant to allow it to replace two cupolas in the coming years. First Energy reported NOx reductions through changes at the Ashtabula power plant and the Eastlake power plant. Alcoa reported a planned voluntary measure of purchasing low-NOx burners. The Northeast Ohio Regional Sewer District reported a planned process change for 2010 that will also reduce NOx emissions.

Reliant Energy, owner of the Avon Lake Power Plant, stated:

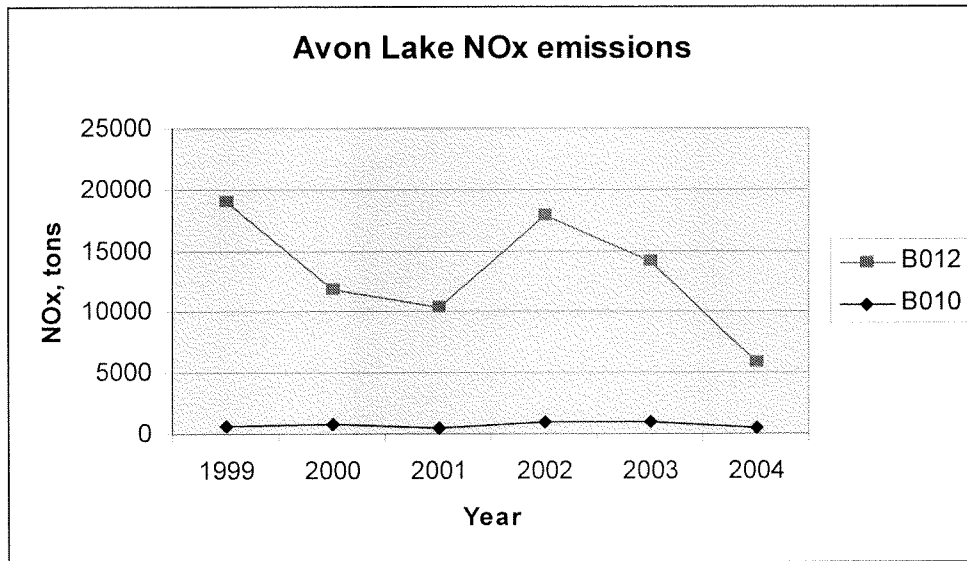
"Avon Lake Power Plant has electrostatic precipitators that were installed in 1978 for units 6 and 7 (boilers 9 and 10) and in 1985 for unit 9 (boiler 12). The ash silos are equipped with dust collection facilities, chutes for unloading ash and equipment to condition ash for truck transport. Fugitive dust emissions from plant roads and coal unloading operations are controlled by water trucks, and paved roads. Coal conveyors are covered and enclosed to reduce fugitives.

In 1997, NOx testing was performed on unit 9 by removing certain burners from service to simulate over-fire air. In 2004, low NOx burners (LNB) with overfire air (OFA) were installed on unit 9 for NOx reduction.

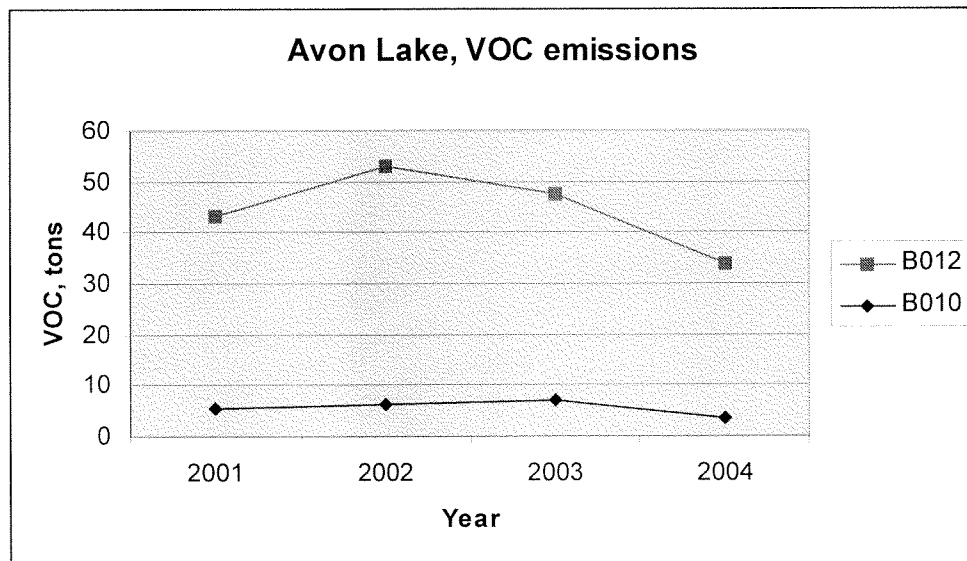
In 2005, a urea based selective non-catalytic reduction system (SNCR) was demonstrated on unit 9 for NOx removal. The demonstration project was successful and we are currently seeking approval from Ohio EPA for permanent use of the system.

In 2005, we also investigated using a lime-slurry injection system for SO2 removal on unit 9. The results have been disappointing to date. We are constantly investigating new technologies for further reductions.

Emissions from the STARSHIP permitting reports were plotted to show the trends for various constituents. These are actual reported emissions and are affected by pollution control equipment, plant operations, and system demand."



The NOx reduction from 2002 to 2004 at Avon Lake Power Plant was about 12,000 tons per year (33 tons per day.)



VOCs were reduced by about 19 tons per year (0.05 tons per day) at Avon Lake Power Plant from 2002 to 2004.

Other emissions changes in Northeast Ohio are anticipated as part of existing federal regulations, including the NOx SIP Call and the Clean Air Interstate Rule (CAIR). The NOx SIP Call will reduce NOx emissions from point sources by approximately 19% prior to 2010. All airshed modeling for the nonattainment area takes the NOx SIP Call reductions into account. Likewise, reductions resulting from the implementation of CAIR are already being taken into account in airshed modeling being performed by the Ohio EPA.

As a result of the NOx SIP Call and CAIR, NOx emissions in Northeast Ohio are expected by USEPA to be reduced by approximately 28,400 tpy (77.8 tpd) by 2015.

III. Emission Reduction Options for Point Sources

The Work Group noted that Ohio EPA may promulgate Reasonably Available Control Technologies (RACT) for groups of industries, as follows, but it is not yet known whether these rules will apply in Northeast Ohio:

Possible VOC RACT rules:

- Volatile organic liquid storage tanks**
- Plastic parts coating**
- Consumer products**
- Architectural & industrial maintenance (AIM) coatings**
- Cold cleaners/degreasers**
- Auto body paint refinishers**
- Portable fuel containers**
- Expansion of OAC 3745-21-11 to include more sources**

No drafts were available at the time of this Report. Thus, the Work Group could not estimate the VOC reductions from possible VOC RACT rules listed above.

Possible NOx RACT rules:

- Industrial boilers, for electric generating units (EGUs) and non-EGUs**
- Combustion turbines**
- Asphalt plants, both stationary and mobile batch plants**

No drafts were available at the time of this Report. Thus, the Work Group could not estimate the NOx reductions from possible NOx RACT rules listed above.

The Work Group reviewed candidate point source control measures studied by the Lake Michigan Air Directors' Consortium (LADCO) as shown in the following sections.

Note: Several LADCO controls originally studied by the Work Group were eliminated from consideration because no affected sources existed in Northeast Ohio. The LADCO controls remaining are discussed in this Report.

Potential NOx Reducing Measures

PT-1, PT-2 Electric Generating Units

Boilers at electric generating units (EGUs) produce steam used to drive turbine generators for electricity production. The fuel used to produce steam is primarily a function of the availability and price of fuels. Although there are many natural gas-fired or gas/oil fired units in the Midwest, it is important to note that coal-fired units constitute the greatest power output and a very high percentage of NOx emissions.

The EGUs in Northeast Ohio are as follows, in alphabetical order by county:

CEI Ashtabula - 0204010000 - 2133 Lake Road, Ashtabula (Ashtabula County)

NOx emissions

2002 - 2,800 Tons

2004 - 1,492 Tons

CEI Lakeshore - 1318000245 - 6800 S. Marginal Rd., Cleveland (Cuyahoga County)

NOx Emissions

2003 - 1,315 Tons

2004 - 1,387 Tons

CEI Eastlake - 0243160009 - 10 Erie Road, Eastlake (Lake County)

NOx Emissions

2002 - 20,667 Tons

2004 - 8,968 Tons

Painesville Municipal Electric Light Plant - 0243110008 - 325 Richmond Street, Painesville (Lake County)

NOx Emissions

2002 - 869 Tons

2004 - 831 Tons

Avon Plant (Reliant Energy) - 0247030013 - 33750 Lake Road, Avon Lake (Lorain County)

NOx Emissions

2002 - 17,871 Tons

2004 - 5,804 Tons

West Lorain Plant - 0247080487 - 7101 West Erie Street, Lorain (Lorain County)

NOx Emissions (calculated - actual emissions may be less)

2002 - 112 Tons

2004 - 107 Tons

The LADCO Potential Control Measures are as follow:

- 2013 Candidate Measure ID EGU1: PT-1**
 - Retrofit NOx BACT (33% reduction from CAIR levels)
 - NOx emissions = 0.1 lbs/mmbtu input

EGU1 Capital Control Cost Estimate
 LADCO: \$700 - \$1,600/ ton NOx reduced
 Industry: \$2,200 – 2,700/ ton NOx reduced

EGU1

	5-State LADCO Region		NE Ohio	
2010 Base NOx Emissions	372,300 tpy	1,020 tpd	15,600 tpy	43 tpd
NOx Reduction	- 122,900 tpy	- 337 tpd	- 5,200 tpy	- 14 tpd
-----	-----	-----	-----	-----
2013 NOx Emissions	249,400 tpy	683 tpd	10,500 tpy	29 tpd
Estimated Capital Costs	\$86 M - \$331 M		\$4 M - 14 M	

- 2013 Candidate Measure ID EGU2: PT-2**
 - NOx BACT for New Plants (53% reduction from CAIR levels)
 - NOx emissions = 0.07 lbs/mmbtu input

EGU2 Capital Control Cost Estimate
 LADCO: \$700 - \$2,100/ ton NOx reduced
 Industry: \$2,200 – 2,700/ ton NOx reduced

EGU2

	5-State LADCO Region		NE Ohio	
2010 Base NOx Emissions	372,300 tpy	1,020 tpd	15,600 tpy	43 tpd
NOx Reduction	- 241,200 tpy	- 660 tpd	- 10,100 tpy	- 28 tpd
-----	-----	-----	-----	-----
2013 NOx Emissions	131,100 tpy	350 tpd	5,500 tpy	15 tpd
Estimated Capital Costs	\$168 M - \$650 M		\$7 M - 27 M	

One option to meet EGU2 would be to switch from coal to natural gas. This would increase the demand for natural gas.

A study on EGUs prepared for LADCO by the Ohio Electrical Utility Institute (OEUI) reports a high job loss associated with further controls on EGUs.

PT-3, PT-4, PT-5 Industrial, Commercial and Institutional (ICI) Boilers

Industrial boilers are generally smaller than boilers in the electric power industry. Industrial boilers typically have a heat input in the 10-250 mmBtu/hr range; however, industrial boilers can be as large as 1,000 mmBtu/hr or as small as 0.5 mmBtu/hour. Most commercial and institutional boilers are quite small, with 80 percent of the population smaller than 15 mmBtu/hour. However, there are several larger coal-fired commercial and institutional boilers in the LADCO region.

The LADCO Potential Control Measures are as follow:

2009 Candidate Measure ID ICI1: PT-3

- Apply 60% NOx Reduction (Similar to NOx SIP Call for large boilers) to midsized boilers (100 – 250 mmBtu/hr). This is equivalent to a 24% reduction from the 2002 levels

ICI1 Capital Control Cost Estimate

LADCO: \$280 - \$1,300/ ton NOx reduced

ICI1

	5 State LADCO Region		NE Ohio	
2009 Base NOx Emissions	219,300 tpy	600 tpd	2,400 tpy	7 tpd
NOx Reduction	- 55,000 tpy	-150 tpd	- 600 tpy	- 2 tpd
-----	-----	-----	-----	-----
2009 NOx Emissions	164,000 tpy	450 tpd	1,800 tpy	5 tpd
Estimated Capital Costs	\$15 M - \$71 M		\$0.2 M – 0.7 M	

2013 Candidate Measure ID ICI2: PT-4

- Apply likely controls to ICIs subject to the proposed Best Available Retrofit Technology (6% reduction over 2002 levels.)

ICI1 Capital Control Cost Estimate

LADCO: \$536 - \$4,493/ ton NOx reduced

ICI2

	5-State LADCO Region		NE Ohio	
2009 Base NOx Emissions	219,300 tpy	600 tpd	2,400 tpy	7 tpd
NOx Reduction	- 13,700tpy	- 37 tpd	- 150 tpy	- 0.4 tpd
-----	-----	-----	-----	-----
2013 NOx Emissions	205,600 tpy	563 tpd	2,200 tpy	6.6 tpd
Estimated Capital Costs	\$7 M - \$61 M		\$0.1 M – 0.7 M	

2009 Candidate Measure ID ICI3: PT-5

- Apply 80% reduction (similar to BART) to all midsized boilers (100 – 250 mmBtu/hr). This is equivalent to a 6% reduction over 2002 levels.)

ICI3 Capital Control Cost Estimate

LADCO: \$536 - \$4,493/ ton NOx reduced

ICI3

	5-State LADCO Region		NE Ohio	
2009 Base NOx Emissions	219,300 tpy	600 tpd	2,400 tpy	7 tpd
NOx Reduction EGUs	- 84,700tpy	- 230 tpd	- 900 tpy	- 2.5 tpd
-----	-----	-----	-----	-----
2013 NOx Emissions	134,600 tpy	370 tpd	1,500 tpy	3.5 tpd
Estimated Capital Costs	\$45 M - \$380 M		\$0.5 M – 4 M	

The Ohio EPA is drafting a NOx RACT (reasonably achievable control technology) rule for ICI Boilers. The overall estimated NOx emission reductions will be between 50-75%. The variability is due to the different types of boilers and fuels used. The exact cut-offs for medium and large boilers have not yet been determined, as they will be based on available technology to actually achieve the reductions.

No NOx control technology is currently available for boilers smaller than 10 mmBtu/hr.

PT-6 Asphalt Batch Plants

Northeast Ohio has more asphalt batch plants than many other nonattainment areas in the five LADCO states.

Consequently, Ohio EPA has determined that it will promulgate a rule that may require low-NOx burners for asphalt batch plants of a certain size. The rule may also require periodic "tune-ups" and reporting.

No draft of the Ohio EPA rule was available at the time of this Report. Consequently, the Work Group was unable to quantify the proposed emission reductions or the costs.

B. Potential VOC Reducing Measures

PT-7, PT-8 Industrial Surface Coatings –Area and Point Sources

According to LADCO, the use of surface coatings by manufacturing industries and other sectors of the economy is pervasive. Applications include coatings that are applied during the manufacture of a wide variety of products by Original Equipment Manufacturers (OEMs) including furniture, cans, automobiles, other transportation equipment, machinery, appliances, metal coils, flat wood, wire, paper, plastic parts, and other miscellaneous products.

Reductions beyond current requirements appear to be reasonable and can be obtained by increasing the stringency of existing RACT rules, eliminating exemptions and lowering applicability thresholds, and extending the geographic coverage of the rules. VOC emissions from area sources exceed those from point sources and it appears that most area source emissions were calculated assuming no control programs are in place. While there is some uncertainty about these emission estimates, it seems feasible to obtain significant emission reductions by requiring non-major sources to reduce emissions using one or more of the techniques described above for major sources.

Candidate control measures include the adoption of more stringent RACT regulations, lower applicability thresholds, and extend geographic coverage. This is a generic control measure based on the use of currently available control methods to reduce emissions from both point and area sources. Many point source industrial surface coating operations are already controlled. LADCO assumed that more stringent requirements are feasible and could generally achieve a 90 percent reduction from uncontrolled levels.

The LADCO Potential Control Measures are as follow:

2009 Candidate Measure ID SOLV5A (Area Sources): PT-7

- Adopt more stringent RACT regulations, lower applicability thresholds and extend geographic areas.

SOLV5A Capital Control Cost Estimate

LADCO: \$100 - \$5,000/ ton VOC reduced

SOLV5A

	5 State LADCO Region		NE Ohio	
2002 Base VOC Emissions	108,100 tpy	296 tpd	5,800 tpy	16 tpd
VOC Reduction	- 77,800 tpy	- 213 tpd	- 4,800 tpy	- 13 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	30,300 tpy	83 tpd	1,000 tpy	3 tpd
Estimated Capital Costs	\$8 - 389 M		\$0.5 - 24 M	

2009 Candidate Measure ID SOLV5B (Point Sources): PT-8

- Adopt more stringent RACT regulations, lower applicability thresholds and extend geographic areas.

SOLV5B Capital Control Cost Estimate

LADCO: \$100 - \$5,000/ ton VOC reduced

SOLV5B

	5 State LADCO Region		NE Ohio	
2002 Base VOC Emissions	49,000 tpy	134 tpd	1,100 tpy	3 tpd
VOC Reduction	- 37,000 tpy	- 101 tpd	- 700 tpy	- 2 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	12,000 tpy	33 tpd	400 tpy	1 tpd
Estimated Capital Costs	\$4 - 185 M		\$0.07 – 3.5 M	

Cost Effectiveness and time frame to implement

Cost effectiveness of applying specific requirements to coating operations would vary depending on the particular source and process type. Factors might include the size of the operation, the age and type of coating equipment used, and availability of add-on controls including high efficiency spray guns or reformulated coatings. Improved transfer efficiency requirements will result in the modification or replacement of conventional spray equipment. Costs for new/modified equipment will be offset by a savings in paint consumption. According to USEPA, the use of add-on control devices such as catalytic or thermal incinerators \$100-5,000 per ton of VOC removed. The cost of reformulation of low-VOC coatings is difficult to predict. BAAQMD assumes a cost-effectiveness of \$2,000 per ton removed based on cost estimates used in the past for coating reformulations.

States generally provided a 2-year period for compliance with RACT rules. LADCO assumed that SIP rules would be adopted in early 2007. If the MRPO states chose to adopt Measure SOLV5A, manufacturers may need to reformulate coatings and sources may be required to install high transfer-efficiency painting equipment or add-on controls. It seems reasonable to assume that a 2-year period after SIP submittal is adequate for the installation of new process or control equipment. Thus, emission reductions would occur in 2009 for the generic control measure described above.

PT-9 Cold Cleaners and Degreasing

According to LADCO, the most promising reductions beyond current requirements can be obtained by increasing the stringency of existing RACT rules and extending the geographic coverage of the rules. Since area source cold cleaning emissions are the largest component of this category, the most promising candidate for strengthening RACT is to adopt limits on the volatility of cleaning solvents used for cold cleaning operations (i.e. max. of 1 mmHg vapor pressure).

The LADCO Potential Control Measures are as follow:

2009 Candidate Measure ID SOLV6A (Area Sources):

- Adopt Chicago/Metro East cold cleaning regulation in additional nonattainment counties.

SOLV6A Capital Control Cost Estimate

LADCO: \$1,400/ ton VOC reduced

SOLV6A

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	56,300 tpy	154 tpd	4,800 tpy	13 tpd
VOC Reduction	- 39,900 tpy	- 109 tpd	- 3,100 tpy	- 8 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	16,400 tpy	45 tpd	1,700 tpy	5 tpd
Estimated Capital Costs	\$ 56 M		\$ 4.3 M	

Cost Effectiveness and time frame to implement

According to LADCO, the existing RACT rules in the Chicago/Metro East areas are very similar to the OTC Model Rule. The OTC estimated a cost of \$1,400 per ton of VOC reduced based on the SCAQMD’s cost analysis for their solvent cleaning rule (Rule 1122). This value should approximate costs that would be incurred to meet the same limits in the OTC rules.

States generally provided a 2-year period for compliance with RACT rules. For the purposes of this White Paper, LADCO assumed that SIP rules would be adopted in early 2007. If the MRPO states chose to extend the existing RACT rules for the Chicago/Metro East areas to additional counties, sources would be required to use solvents with lower volatility. Since the lower-VOC content limits already California and several northeastern states, solvent manufacturers would not need to reformulate products. It seems reasonable to assume that a 2-year period after SIP submittal is adequate for the installation of controls.

Ohio EPA is proposing a rule that would strengthen RACT requirements on cold cleaning emissions by adopting limits on the volatility of the cleaning solvents themselves, with a

maximum of 1 mmHg vapor pressure. Such limits are already in force in California, in several eastern states, and in Chicago, Illinois. The expected benefit in Ohio would be a 54% improvement in VOC emissions.

PT-10, PT-11 Architectural and Industrial Maintenance (AIM) Coatings

According to LADCO, several states in the Ozone Transport Region, made up of the 12 eastern seaboard states from Virginia to Maine and the District of Columbia, are in the process of adopting AIM coating rules. The OTC developed a Model Rule for AIM Coatings that requires manufacturers to reformulate coatings to meet specified VOC content limits, which are based on the SCM adopted by ARB and the STAPPA/ALAPCO model rule for AIM Coatings. All products manufactured for sale or use within an OTC State after January 1, 2005 would need to comply with the VOC content limits in the AIM OTC Model Rule.

According to LADCO, in general, VOC emission reductions can be obtained through product reformulation - modifying the current formulation of the coating to obtain a lower VOC content. Product reformulation can involve one or several of the following approaches:

- Replacing VOC solvents with non-VOC solvents;
- Increasing the solids content of the coating;
- Altering the chemistry of the resin so that less solvent is needed for the required viscosity; and,
- Switching to a waterborne latex or water-soluble resin system.

The regulatory approach for reducing emissions is to establish VOC content limits for specific coatings that manufacturers are required to meet either through reformulating products or substituting products with compliant coatings.

The LADCO Potential Control Measures are as follow:

2009 Candidate Measure ID SOLV1A: PT-10

- 21% reduction beyond Federal AIM Rules (40 CFR Part 59) and Wisconsin NR433.17 requirements

SOLV1A Capital Control Cost Estimate

LADCO: \$6,500/ ton VOC reduced

SOLV1A

	5 State LADCO Region		NE Ohio	
2002 Base VOC Emissions	109,000 tpy	299 tpd	7,500tpy	20 tpd
VOC Reduction	- 22,900 tpy	- 63 tpd	- 1,600 tpy	- 4 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	86,200 tpy	236 tpd	6,000 tpy	16tpd
Estimated Capital Costs	\$145 M		\$37 M	

2013 Candidate Measure ID SOLV1B: PT-11

- Adopt Southern California Air Quality Monitoring District (SCAQMD) Phase III VOC limits in addition to the VOLV1A limits (13.4% reduction beyond SOLV1A).

SOLV2A Capital Control Cost Estimate

LADCO: \$20,000/ ton VOC reduced

SOLV1B

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	86,200 tpy	236 tpd	6,000 tpy	16 tpd
VOC Reduction	- 11,600 tpy	- 32 tpd	- 800 tpy	- 4 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	74,500 tpy	204 tpd	5,200 tpy	12tpd
Estimated Capital Costs	\$232 M		\$16 M	

Total Estimate Costs for SOLV1A & SOLV1B

	5 State LADCO Region	NE Ohio
Total Estimated Capital Costs	\$377 M	\$53 M

Cost Effectiveness and time frame to implement

LADCO's analysis for the OTC Model Rule estimated a cost of \$6,400 per ton of VOC reduced based on CARB's SCM cost analysis. The SCAQMD calculated the cost effectiveness of this control measure to be approximately \$20,000 per ton. This value is based on an incremental reformulation cost of \$8.00 per gallon for the architectural coating categories targeted by this control measure. LADCO could not determine at this time the additional reductions that might be obtained by developing reactivity-based emission limits for AIM coatings.

The OTC Model Rule includes a "sell-through" provision that allows a three-year window during which manufacturers and distributors may continue to sell products that were produced before a set deadline, even if they do not meet the more stringent VOC limits. This three-year window creates time for manufacturers to reformulate while continuing to sell their existing products. However, many manufacturers are currently manufacturing products that meet the California and OTC limits. In additions, product inventories turn over quickly. Thus, it seems reasonable that a two-year window creates time for manufacturers to reformulate while continuing to sell their existing products in the MRPO region. As a result, the full emission reduction potential achieved by adoption of the OTC Model Rule could be realized within two years of adoption of the rule (i.e., 2009).

The following standards are described by various rules:

- (1) Flat paints: USEPA = 250 g/L limit on solvents (gallon of paint, less water).

OTC model rule = 100 g/L limit on solvents.

(2) Non-flat paints. USEPA = 380 g/L limit on solvents.
OTC model rule = 150 g/L, essentially eliminating all solvents.

(3) Primers. USEPA = 350 g/L limit on solvents.
OTC model rule = 200 g/L, again, essentially eliminating all solvents.

There is a 1-quart exemption under both the USEPA rule and the OTC model rule.

For industrial maintenance coatings, the following standards exist:

USEPA = 450 g/L limit on solvents.

OTC model rule – 340 g/L limit on solvents.

CARB (California Air Resources Board) rule = 250 g/L limit.

SCAQMD (South Coast Air Quality Management District) rule = 100 g/L limit.

The Work Group noted that Ohio might attempt to take SIP credit for the paint purchases made in Ohio of paints and varnishes that are already manufactured in accordance with the OTC standards or any of the California standards. USEPA is supposed to publish guidance on this topic in 2006.

PT-12, PT-13 Consumer and Commercial Products

According to LADCO, VOC emission reductions can be obtained through product reformulation - modifying the current formulation of the coating to obtain a lower VOC content. The product reformulation options vary with each product category, and can involve one or more of the following approaches:

- Replacing VOC solvents with a water-based formulation;
- Replacing VOC solvents with acetone or another exempt solvent
- Increasing the solids content of the product;
- Formulating a non-VOC propellant; and,
- Changing the valve, container, or delivery system to reduce VOC content.

The LADCO Potential Control Measures are as follow:

2009 Candidate Measure ID SOLV2A: PT-12

- Adopt Ozone Transport Commission (OTC) Model Rule with additional product coverage and more stringent VOC limits (14.2 % reduction beyond Federal Consumer and Commercial Products Rules (40 CFR Part 59)).

SOLV2A Capital Control Cost Estimate

LADCO: \$800/ ton VOC reduced

SOLV2A

	5 State LADCO Region		NE Ohio	
2002 Base VOC Emissions	165,800 tpy	454 tpd	10,800tpy	29 tpd
VOC Reduction	- 23,500 tpy	- 64 tpd	- 1,500 tpy	- 4 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	142,300 tpy	390 tpd	9,300 tpy	25 tpd
Estimated Capital Costs	\$19 M		\$1.2 M	

2009 Candidate Measure ID SOLV2B: PT-13

- Adopt California Area Resources Board (CARB) requirements in addition to SOLV2A.
(12.5 % reduction beyond SOLV2A)

SOLV2B Capital Control Cost Estimate

LADCO: \$4,800/ ton VOC reduced

SOLV2B

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	142,300 tpy	390 tpd	9,300 tpy	25 tpd
VOC Reduction	- 17,800 tpy	- 49 tpd	- 1,200 tpy	- 3 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	124,500 tpy	341 tpd	8,100 tpy	22 tpd
Estimated Capital Costs	\$85 M		\$6 M	

Total Estimate Costs for SOLV2A & SOLV2B

	5 State LADCO Region	NE Ohio
Total Estimated Capital Costs	\$104 M	\$7.2 M

Cost Effectiveness and time frame to implement

According to LADCO, CARB has estimated the cost of their mid-term measures rule to be \$800 per ton. Since the OTC Model Rule emission limits are based on California's, this value should approximate costs that would be incurred to meet the same limits in the OTC rules.

LADCO assumed that rules will be adopted in 2007 and that the rules will allow a 2-year "sell-through" period, with full compliance occurring in 2009.

The OTC model rule for Consumer and Commercial Products would reduce VOC emissions by 14% over the USEPA rule.

PT-14, PT-15 Auto Body Refinishing (High Volume Low Pressure (HVL) spray guns)

According to LADCO, auto body refinishing includes the application of coatings subsequent to original equipment manufacture (OEM). (Coating of new cars is not included in this category). Vehicles included in this category are passenger cars, trucks, vans, motorcycles, and other mobile equipment capable of being driven or drawn on the highway. The majority of these operations occur at small body shops that repair and refinish automobiles. The coating applications include washes, primers, primer surfacers, and primer sealers, and topcoats. Emissions of volatile organic compounds (VOC) result from the evaporation of solvents during application, curing, and cleanup. Emissions are typically controlled through use of compliant coatings, increased transfer efficiency, and control of clean-up solvents.

The LADCO Potential Control Measures are as follow:

2009 Candidate Measure ID SOLV4A: PT-14

- Extend the existing VOC RACT regulations beyond the 1-hour Ozone nonattainment counties.

SOLV4A Capital Control Cost Estimate

LADCO: \$1,354/ ton VOC reduced

SOLV4A

	5 State LADCO Region		NE Ohio	
2002 Base VOC Emissions	25,300 tpy	69 tpd	1,900 tpy	5 tpd
VOC Reduction	- 6,200 tpy	- 17 tpd	- 550 tpy	- 1.5 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	19,100 tpy	52 tpd	1,350 tpy	3.5 tpd
Estimated Capital Costs	\$8.3 M		\$0.75 M	

2009 Candidate Measure ID SOLV4B: PT-15

- Adopt more stringent RACT requirements based on SCAQMD 1145

SOLV4B Capital Control Cost Estimate

LADCO: \$7,200/ ton VOC reduced

SOLV4B

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	25,300 tpy	69 tpd	1,900 tpy	5 tpd
VOC Reduction	- 20,600 tpy	- 56 tpd	- 1,500 tpy	- 4 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	4,700 tpy	13 tpd	400 tpy	1 tpd
Estimated Capital Costs	\$148 M		\$11 M	

Cost Effectiveness and time frame to implement

According to LADCO, the existing RACT rules in Illinois, Indiana, and Wisconsin are similar to the Ozone Transport Commission (OTC) Model Rule. The OTC estimated a cost of \$1,354 per ton of VOC reduced based on the use of High Volume Low Pressure (HVLP) spray guns and a gun cleaning system. This value should approximate costs that would be incurred to meet the same limits in the OTC rules.

States generally provided a 2-year period for compliance with RACT rules. For the purposes of this White Paper, LADCO assumed that SIP rules would be adopted in early 2007. If the LADCO states chose to extend the existing RACT rules for 1-hr nonattainment areas to additional counties, sources would be required to install high transfer-efficiency painting equipment and institute methods and controls on emissions from equipment cleaning and housekeeping activities, and conduct operator training. Since the VOC content limits in the existing RACT rules are very similar to the Part 59 VOC limits, manufacturers would not need to reformulate products. It seems reasonable to assume that a 2-year period after SIP submittal is adequate for the installation of controls. Thus, emission reductions would occur in 2009 for Measure SOLV4A.

Ohio EPA is proposing a rule that would require the new of high-efficiency transfer spray guns and improved work practices, for an estimated VOC reduction of 28% from current levels.

PT-16, PT-17, PT-18 Gasoline Distribution Facilities (GDFs)

"Emissions associated with gasoline dispensing facilities are Stage I emissions, Stage II emissions, and tank breathing losses.

"Stage I Emissions - emissions from the underground storage tanks (USTs) when they are refilled with gasoline. The incoming gasoline displaces the gasoline vapor in the tank. USEPA requires these emissions to be controlled by recycling the vapor back into the tank truck, but the control effectiveness is not 100%.

Stage II Emissions - emissions at the pump when vehicles are refilled. The emissions come from the vehicle's fuel tank. All modern vehicles are equipped with onboard vapor recovery systems or ORVR (phase-in of these requirements started in 1998), but older vehicles do not have these systems.

"Breathing Losses - when vehicles are refueled, makeup air enters the UST from pipes above the ground, and this air mixes with the gasoline vapor in the UST, causing a small amount of UST breathing losses each time a vehicle is refueled." (Source: *Environ Final Report to LADCO, "Development of Technical Information for a Regional Fuels Strategy, Feb. 28, 2006."*)

According to LADCO, the most promising reductions beyond current requirements can be obtained by increasing the required control efficiency of Stage I vapor recovery systems from 90 to 98 percent in areas with existing Stage I programs and requiring Stage I vapor recovery systems in areas that currently do not have Stage I vapor recovery requirements. Additional reductions could be obtained by requiring Stage I vapor recovery in counties bordering 8-hour ozone nonattainment areas. The Stage I requirements could be based on the CARB EVR Module 1 requirements, which changes the control efficiency requirement to 98 percent, requires **P/V valves** on all systems, and contains additional specifications to prevent leaks.

Cost Effectiveness and time frame to implement

CARB estimated the cost effectiveness of upgrading existing systems to meet Phase I of the EVR program to range from \$0 to 2,120 per ton of VOC reduced. For larger stations (monthly throughput greater than 300,000 gallons), CARB estimated that the EVR Phase I enhancements would pay for itself with the value of the recovered gasoline. For smaller stations (monthly throughput less than 15,000 gallons), CARB estimated the cost effectiveness to be \$2,120 per ton for the Phase I EVR program. For stations without Stage I vapor recovery systems, the cost effectiveness of new systems is estimated to be between \$100 to \$4,742 depending on the size of the station. **Note: All GDFs in Northeast Ohio already have Stage I and Stage II vapor recovery systems. However, they are not the same as the enhanced California standards.**

In the Northeast Ohio nonattainment area, for the counties other than Cuyahoga, in 2004, of the GDFs under Ohio EPA-NEDO jurisdiction, 216 inspections were done, 45 had to schedule a re-test, 15 had to schedule a second re-test, and 5 had to schedule a third re-test. In 2005, 195 inspections were done, 80 needed a retest, 14 needed a second re-test, and 2 had to schedule a third re-test. General compliance with existing requirements appears to be an issue.

States generally provided a 2-year period for compliance with RACT rules. For the purposes of this White Paper, LADCO assumed that SIP rules would be adopted in early 2007. If the MRPO states chose to adopt the CARB EVR requirements for Stage I, it seems reasonable to assume that a 2-year period after SIP submittal is adequate for the installation of controls. Thus, emission reductions would occur in 2009 for Measure SOLV7A.

The LADCO Potential Control Measures are as follow:

2009 Candidate Measure ID SOLV7A: PT-16

- Adopt CARB EVR (Enhanced Vapor Recovery) Stage I Requirements

SOLV7A Capital Control Cost Estimate

LADCO: \$0 – 2,100/ ton VOC reduced

SOLV7A

	5 State LADCO Region		NE Ohio	
2002 Base VOC Emissions	42,300 tpy	116 tpd	1,200 tpy	3 tpd
VOC Reduction	- 33,000 tpy	- 90 tpd	- 900 tpy	- 2 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	9,000 tpy	26 tpd	300 tpy	1 tpd
Estimated Capital Costs	\$ 0 - 69 M		\$ 0 - 2 M	

There are 858 gasoline distribution facilities (GDFs) in the Northeast Ohio nonattainment area. All are currently required to have Stage I vents on the fill pipes to capture vapors.

2009 Candidate Measure ID SOLV7B: PT-17

- Adopt CARB EVR (Enhanced Vapor Recovery) Stage II Requirements

SOLV7B Capital Control Cost Estimate

LADCO: \$840 – 13,400/ ton VOC reduced to upgrade to Stage II

LADCO: \$13,300 (2009) – 28,500 (2015)/ ton VOC reduced to upgrade to Stage II

SOLV7B

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	22,000 tpy	60 tpd	900 tpy	3 tpd
VOC Reduction	- 18,000 tpy	- 49 tpd	- 600 tpy	- 2 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	4,000 tpy	11 tpd	300 tpy	1 tpd
Estimated Capital Costs	\$ 15 – 32 M		\$ 0.5 - 10 M	

2009 Candidate Measure ID SOLV7C: PT-18

- Require air pollution control devices for underground storage tank vents.

SOLV7C Capital Control Cost Estimate

LADCO: Minimal if system recovers gasoline and returns it to the storage tank.

SOLV7C

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	10,000 tpy	27 tpd	400 tpy	1.3 tpd
VOC Reduction	- 7,000 tpy	- 19 tpd	- 300 tpy	- 1 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	3,000 tpy	8 tpd	100 tpy	0.3
Estimated Capital Costs	\$ Minimal		\$ Minimal	

PT-19, PT-20 Glass Manufacturing

2009 Candidate Measure ID GLASS1: PT-19

- Apply controls to achieve 30% reduction over uncontrolled.

GLASS1 Capital Control Cost Estimate

LADCO: NA

GLASS1

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	NA	NA	280 tpy	0.75 tpd
VOC Reduction	- 5,100 tpy	- 14 tpd	- 50 tpy	- 0.14 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	NA	NA	230 tpy	0.61 tpy
Estimated Capital Costs	\$ Unknown		\$ Unknown	

2009 Candidate Measure ID GLASS2: PT-20

- Highly Cost Effective Controls (75% reduction over uncontrolled.)

GLASS2 Capital Control Cost Estimate

LADCO: NA

GLASS2

	5 State LADCO Region		NE Ohio	
2009 Base VOC Emissions	NA	NA	280 tpy	0.75 tpd
VOC Reduction	- 12,800 tpy	- 35 tpd	- 130 tpy	- 0.35 tpd
-----	-----	-----	-----	-----
2009 VOC Emissions	NA	NA	150 tpy	0.40 tpy
Estimated Capital Costs	\$ Unknown		\$ Unknown	

It is believed that there is just one source in Northeast Ohio subject to this possible control, and it is located in Lake County.

III. Energy Efficiency and Renewable Energy

Energy Policy Act of 2005

The Work Group found that many air pollution controls were already in place on many businesses, including new controls on electric generating utilities (EGUs), which will begin to show effect in 2009-2015. In addition, the Work Group also considered the energy efficiency provisions of the federal Energy Policy Act of 2005, hoping to find ways to reduce air pollution through demand-side management, which would also save Northeast Ohio residents money.

The federal Energy Policy Act of 2005 contains the following provisions of interest, as well as many other topics:

The United States Department of Energy (DOE) may ask each state to review its own energy conservation plan - \$100 million per year for FY 2006 and FY 2007, plus \$125 million for FY 2008, for State Energy Program grants.

- Authorizing \$50 million per year through FY 2010 for matching funds for state programs to provide rebates to consumers to purchase Energy Star appliances.
- Authorizing \$30 million per year in grants through FY 2010 for local government units to improve energy efficiency in public buildings and facilities through construction or renovation.
- Authorizing \$20 million per year in grants through FY 2008 for energy efficiency and alternative energy in low-income communities.
- Authorizing \$25 million per year through FY 2010 to assist states in setting up building energy-efficiency codes.
- Creation by USEPA and DOE of a Small Business Energy Clearinghouse for resources.
- New energy efficiency standards for:
 1. ceiling fan light kits,
 2. dehumidifiers,
 3. unit heaters,
 4. torchiere lamps,
 5. medium base compact fluorescent lamps,
 6. 34-W fluorescent lamp ballasts,
 7. mercury vapor lamp ballasts,
 8. illuminated exit signs,
 9. traffic signals and pedestrian signals,
 10. commercial pre-rinse spray valves,
 11. low-voltage dry-type distribution transformers,
 12. vending machines (2009)
 13. Other ceiling fan light kits (2007),
 14. By 2008, DOE is to determine whether to set standards for battery chargers and external power supplies,
 15. furnace fans,
 16. commercial package air conditioning and heating equipment,

- 17. commercial refrigerators and freezers,
- 18. commercial ice makers,
- 19. commercial clothes washers,
- 20. other commercial freezers (2009).
- A study of intermittent escalators.
- A study of demand-side management programs run by electric and natural gas utilities (2006).
- A pilot program for 3-7 states to carry out energy efficiency programs to reduce consumption of electricity or natural gas by at least 0.75 percent per year (\$25 million total through 2010).
- Requiring HUD to create strategies for energy efficiency in public housing.
- Consideration of “Net Metering” for electric utilities, so that customers who generate are only billed for their net electricity; development of a 10-year plan to increase the efficiency of fossil fuel generation.
- Consideration of “Smart Metering” so that electric utilities would offer all customers a time-based rate schedule such as time-of-use pricing, critical peak pricing, real-time pricing, and peak load reduction credits.
- Tax deduction for new and renovated commercial buildings that use 50% less energy.
- Tax credit for builders of new energy-efficient homes.
- Tax credit (total of \$500) for homeowners who put in windows, insulation, doors, air conditioners, heat pumps, water heaters, furnaces, boilers, and fans, which meet energy-efficiency standards.
- Tax credit for purchasers of solar equipment and fuel cells.
- Tax credit for businesses buying fuel cells and stationary micro turbine power plants.
- A study to determine how to make the U.S. Capitol Complex more energy efficient and to consider installing a garden and distributed generation of the Dirksen Senate Office Building Rooftop - \$10 million.

The Work Group noted several opportunities for Ohio to tap into grant funding for energy efficiency.

Also, states are still allowed to create appliance standards for those electric appliances not covered in the federal legislation. Setting such standards would create energy and air pollution savings to Ohio residents.

According to the Northeast Energy Efficiency Partnerships (NEEP), if Northeast states (similar to Ohio) enact the efficiency standards that have not been preempted, the Northeast would realize an additional reduction of 6,000 gigawatt-hours. More importantly, during a time when natural gas and heating oil prices are rising, natural gas consumption would be reduced by an additional 20,000 billion BTUs and heating oil use by 5,000 billion BTUs. These additional savings would mean another 7.5 billion in economic benefits.

For example, New York's Appliance and Equipment Energy Efficiency Standards Act of 2005 established state energy efficiency standards for 14 household appliances and electronic equipment not covered by federal standards. The law also requires efficiency standards for electronic products that use standby power when they are turned off but remain plugged in (e.g.,

DVD players and recorders) to reduce "phantom" or "vampire" energy consumption. These standards are expected to save 2,096 GWh of electricity annually, enough to power 350,000 homes. This equates to annual savings of \$284 million per year.

Massachusetts, in November 2005, enacted energy efficiency standards for residential furnaces, furnace fans and boilers, lighting appliances, electronic equipment and transformers. The legislation will save Massachusetts \$850 million and reduce electricity use by about 700,000 MWh per year by 2020 (the equivalent of about 100,000 homes). The furnace and boiler standards alone will reduce natural gas and heating oil consumption by 2 trillion Btus per year (equivalent to about 25,000 homes).

"Biofuel and Renewable Energy Task Force Report" of 2004, ODOD

The Work Group continued to focus on energy efficiency, studying the "Biofuel and Renewable Energy Task Force Report" compiled by the Ohio Department of Development for Governor Taft and the Ohio General Assembly on March 1, 2004.

The Report recommended, among other topics:

- that the State of Ohio purchase renewable energy;
- that the State of Ohio set its own standard to reduce energy use;
- education of schoolchildren regarding renewable energy;
- a feasibility study of the LEED (Leadership in Energy and Environmental Design) rating system for building construction;
- a renewable energy production tax credit;
- extending the rider on retail electric distribution service rates that fund the Energy Efficiency Revolving Loan Fund;
- reforming state tax policy to give parity to Ohio-based biofuel and renewable energy industries;
- having the Public Utilities Commission of Ohio (PUCO) require electric utilities to disclose yearly investments in renewable energy development;
- having PUCO disallow rate increases where there is no renewable energy initiative on the part of the utility;
- having PUCO require electric utilities to provide an inventory of renewable energy assets; and
- having PUCO create standard interconnection rules for distributed generation up to 10 megawatts of electric power.

As noted in a following section, a LEED rating system for building construction would bring environmental, air quality, and cost-saving benefits to homeowners and businesses.

Voluntary Municipal Reduction Goal

The Work Group reviewed the USEPA Guidance on "SIP Credits for Emission Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures (Aug. 2004)." It was seen that SIP credits were available for voluntary measures enacted by industry.

Projects that might qualify include electric sector energy efficiency and renewable energy projects, initiatives, or measures that will result in quantifiable reductions in emissions at existing fossil fuel-fired electric generating units and will improve air quality in a nonattainment area.

Such projects could include:

(A) Demand-side management energy efficiency projects, such as:

- (1) programs to replace existing electrical devices with more energy efficient devices (e.g., lights, appliances, air conditioners, pumps, etc.) including Energy Star rated products; or
- (2) programs related to design, construction, or reconstruction which by themselves do not use energy but result in energy savings (e.g., reflective roofs, double-pane windows, increased insulation, and building codes containing these requirements).

(B) Supply-side measures, which include new and innovative initiatives to increase the efficiency, or decrease the emissions, from electricity generation. This could include:

- (1) combined heat and power (CHP) projects,
- (2) fuel cell power generation, or
- (3) renewable energy projects such as wind-powered generation, solar-powered generation, or use of biofuels that emit less air pollution.

Programs and policies that require or otherwise bring about these measures include system benefit charge programs, renewable portfolio standards, emissions portfolio standards, output-based emissions limits, green power purchasing requirements, energy efficient equipment purchasing requirements, enhanced building codes, and others such as incentives to install CHP.

One such voluntary measure shown as an example was a SIP revision submitted by the Texas Commission on Environmental Quality in which the Dallas/Fort Worth, Texas, area agreed, in statute through Senate Bill 5, that each political subdivision would reduce electricity consumption by 5 percent per year for 5 years, beginning 1/1/02. Retail electricity providers, as required by Senate Bill 7, must implement energy efficiency measures that will reduce annual growth in electricity demand by 10 percent by 1/1/04 and each year thereafter, to achieve NO_x reductions.

Senate Bill 5 is estimated to reduce electricity use by 401,772 MWh in 2007 in three electric service areas. Senate Bill 7 is expected to reduce electricity use by 510,383 MWh in 2007 in four electric service areas. Total NO_x reductions are estimated in the 12 counties of the Dallas/Fort Worth nonattainment area and "collar" area of 0.7 tons per day.

The Work Group noted that in the Northeast Ohio ozone nonattainment area, NO_x emissions

from electric generating units (EGUs) were 120.44 tons per day in 2002. **If even a 1 percent reduction could be achieved voluntarily, it would save 1.20 tons per day of NOx. Cost savings would also result.**

The Work Group also noted that consumers, cities, counties, and businesses would all have to join the effort if a target goal were set. The Northeast Ohio Regional Sewer District (NEORS) is the nonattainment area's largest electric customer, and it cannot reduce its draw on the grid until 2010 when an equipment change is planned.

Wind, Solar, and Nuclear Energy

Alternative Energy – Wind Power: The Work Group heard a presentation from Green Energy Technologies Inc., which had hoped to install a demonstration project involving one wind turbine (Smart Energy Tower) at both Cleveland-Hopkins Airport and at Case Western Reserve University. It was apparent that, when the towers are in production and available to large businesses, they could be used successfully as back-up electricity sources, reducing draw on the traditional grid. The towers were also planned to be used for cellular purposes, wireless Internet, and hydrogen production for some shuttle vehicles at both the airport and the university.

As of the date of this report, Green Energy Technologies, Inc., has not received the grant that would have provided construction money. In addition, Cleveland-Hopkins Airport has determined that the proposed wind turbine would require \$18,000 each year in operating costs while only generating \$12,000 in electricity benefits.

Therefore, it is not anticipated that the planned wind turbines will go forward.

However, the City of Cleveland has instituted a study of wind power by placing a monitoring device at the Intake Crib on Lake Erie, in preparation for a future traditional propeller-style wind turbine at the Great Lakes Science Center in Cleveland.

Alternative Energy - Solar: The Work Group investigated tax credits for solar panels for homeowners and businesses, finding that the federal Energy Policy Act of 2005 provides:

Section 1335 creates a tax credit for individuals who purchase solar photovoltaic cells, solar water heaters, and fuel cells to provide electricity or hot water for their homes. The credit is equal to 30 percent of the cost of the equipment, up to \$2,000 each for photovoltaic cells and solar water heaters, and \$500 for each half kilowatt of capacity of fuel cell property. Efficiency requirements apply. The credit is for equipment "placed in service" between 1/1/06 and 12/31/07, only.

Section 1336 creates a tax credit for businesses that install energy-efficient fuel cells and stationary micro-turbine power plants. The credit for fuel cells is 30 percent of the cost, up to \$500 per half kilowatt of capacity. The credit for micro-turbines is 10 percent of the cost, up to \$200 per kilowatt of capacity, with a limit of 2,000 kW. The credit is for equipment "placed in service" between 1/1/06 and 12/31/07.

Alternative Energy – Nuclear Power: The Work Group heard an update from First Energy, which owns nuclear facilities supplying electricity in Northeast Ohio. First Energy has no plans to install additional nuclear generating capacity before 2010 and, even if plans existed, permitting requirements would be time-prohibitive for such a deadline.

Green Buildings

The Work Group noted that no municipalities in the Northeast Ohio nonattainment area have "green building" requirements, although several municipalities have recommended practices for builders.

Codes typically specify requirements for "thermal resistance" in the building shell and windows, minimum air leakage, and minimum heating and cooling equipment efficiencies. These measures can reduce energy use by 30 percent or more, resulting in cost savings for businesses and consumers (DOE 2005b). Building energy codes also reduce peak energy demand, air pollution, and greenhouse gas emissions. Recognizing these benefits, a majority of states have adopted building energy codes in some form for residential and commercial construction.

The State of Ohio could create a "Model Building Code" for the entire state, creating a LEED (Leadership in Energy and Environmental Design) Green Building Rating System.

Other options could include (1) offering property tax incentives and abatement to housing that qualifies as "green" and (2) educating general contractors on "green building" methods, thus encouraging their use.

OPTIONS RESULTING FROM ENERGY EFFICIENCY

The Task Force may wish to consider the following options, based on this section:

- PT-21** Tapping into grant funding for energy efficiency projects.
- PT-22** Creating state appliance standards for electric appliances not covered by federal law.
- PT-23** Having PUCO disallow electric rate increases where there is no renewable energy initiative on the part of the EGU.
- PT-24** Setting a statewide or nonattainment-area-wide electricity reduction goal of 5%.
- PT-25** Creating incentives for government entities and businesses to replace electric devices with energy efficient models.
- PT-26** Creating incentives for combined heat and power (CHP) projects.
- PT-27** Encouraging generation of wind power on or near Lake Erie.
- PT-28** Creating a statewide Model Green Building Code with a LEED Green Building Rating System.

Other proposals based on the information in this section may be suitable for further study by the Long-Range Air Quality Issues Work Group, in that they may not be capable of implementation before 2009.

V. Enforcement and Funding PT-29

The Work Group noted that air pollution benefits could be obtained simply through greater enforcement of controls already mandated by law in Ohio.

PT-29 Increased funding for the City of Cleveland Division of Air Quality, the Lake County General Health District, and the Akron Regional Air Quality Management District would advance that goal.

A minimum of \$200,000 per year per local air agency would allow the hiring of 2 or more employees at each agency.

Cost: \$600,000

The Work Group also notes that further funding could be provided for the Ohio EPA Office of Compliance Assistance and Pollution Prevention (OCAPP). OCAPP assists small businesses to understand their regulatory requirements, free of charge. Such assistance undoubtedly helps to reduce air pollution through greater compliance with existing laws and regulations.

Cost: \$200,000

Total: \$800,000

The Work Group studied the successful implementation of NOx credit trading banks in other states. The Work Group looked at amending Ohio's "Nitrogen Oxides - Budget Trading Program." to allow banking and trading in a system that would be "user friendly" and easily accessible by businesses in Northeast Ohio and by those wishing to locate in Northeast Ohio. The "bank" would be a central location in which information about air emissions, reductions, credits, and offsets could be kept so that businesses that need offsets would know where they might be found and purchased.

The Work Group determined that a "bank" would create a market value for NOx reductions, thus providing an incentive for existing sources to reduce their emissions. Forced retirement of credits would also be possible by the Ohio EPA Director.

O.R.C. § 3704.03(V) currently provides the Ohio EPA with authority to implement an emissions banking and trading program, however, the scope of the statute appears to be quite limited, and the Director's authority is only discretionary. The statute states:

"The director of environmental protection may do any of the following: (V) Provide for emissions trading, marketable permits, auctions of emission rights, and economic incentives that would reduce the cost or increase the efficiency of achieving a specified level of environmental protection." O.R.C. § 3704.03(V).

Language has been suggested by the law firm of Squire, Sanders, & Dempsey, representing the Ohio Steel Group, to expand the statute as follows:

"The director of environmental protection shall create and maintain an emission reduction credit banking and trading program to help make emission offsets available for new and modified sources in nonattainment areas, while encouraging voluntary emission reductions of those pollutants most critical to achieving national air quality standards.

Voluntary emission reductions that are real, quantifiable, and permanent shall be eligible for banking as emission reduction credits (ERCs). ERCs may be certified by a licensed Ohio professional engineer for the purpose of verifying and documenting that these emission reductions are voluntary, real, quantifiable, and permanent.

Owners of ERCs or certified ERCs (CERCs) may post relevant information about ERCs and CERCs on a website operated and maintained by the director or his designee.

Banked ERCs and CERCs may be transferred among parties without limitation and without the director's approval. Banked ERCs and CERCs shall be included in relevant emissions inventories to make them available for use as offsets under the nonattainment new source review program.

The director shall review ERCs and CERCs when a complete application is submitted for their use as an offset or for their permanent retirement and removal from the bank when an applicant

specifies that such a review is warranted.

The director may develop rules consistent with this statute to implement the emission reduction credit banking and trading program. Such rules shall include provisions that (1) Establish a simple and efficient process for posting relevant information about ERCs and CERCs on a website or otherwise make the information available to the public as quickly as practicable; (2) Assure that unusual or abnormal operational patterns can be accounted for in the determination of any source's baseline from which reductions would be made; and (3) Establish guidelines for measuring and quantifying emissions to help increase the certainty that banked ERCs and CERCs will be approvable as offsets when reviewed by the agency.

The director shall also consider the role of a third party professional in the banking, verification, validation of use, enforcement, and program audits associated with ERCs, and, to the maximum extent possible, create and preserve opportunities for private sector participation in any emissions trading program established by the director."

The Work Group noted that nearby states such as Pennsylvania already post such information on a website that is easily accessible to businesses and which may have drawn new businesses away from Ohio because offsets were easier to find and obtain.

Cost: The cost of such a measure would involve both computer equipment and staff on the part of the Ohio EPA.

VII. Voluntary Measures for Point Sources

The Work Group reviewed the USEPA Guidance on “Incorporating Emerging and Voluntary Measures in a SIP” (Sept. 2004), as well as reviewing the USEPA Guidance on “SIP Credits for Emission Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures (Aug. 2004).

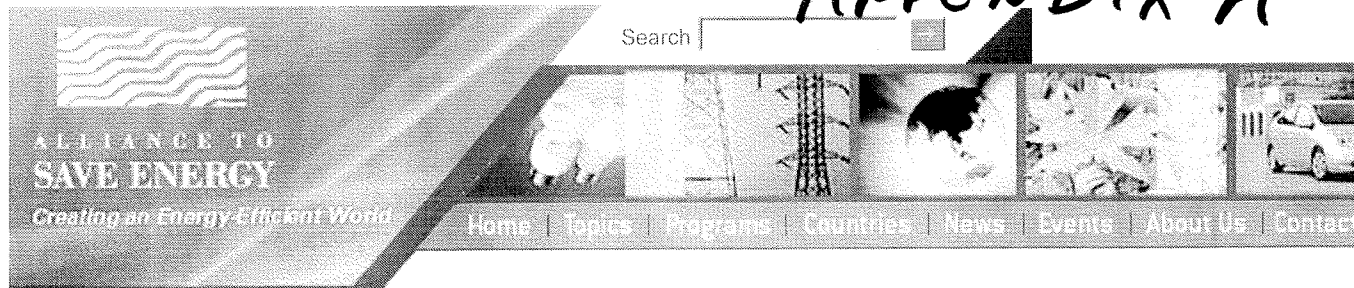
At the time it was hoped that the 6% SIP credits available for voluntary measures from point sources would be used in Northeast Ohio’s ozone SIP, if sufficient detail regarding emission reductions became available from the sources implementing them. However, no clear examples of voluntary measures came to the Work Group, although Alcoa stated that it would voluntarily use low-NO_x burners in future construction for new, replacements, or rebuilt facilities, if any were undertaken.

VIII. Public Education

The general public and industry might benefit from greater education concerning the challenges of meeting the new 8-hour Ozone NAAQS.

The Work Group studied additional funding so that NOACA could provide the required educational services concerning the ways that residents of the nonattainment area might assist in achieving attainment. No dollar figure was set.

APPENDIX A



- Information For:
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Energy-Efficiency Provisions in the Energy Policy Act of 2005

November 18, 2005

Following more than four years of debate, the United States has a new comprehensive energy bill for the first time since 1992. The House of Representatives passed the conference report to The Energy Policy Act of 2005 on July 28 by a vote of 275-156; the Senate followed suit the next day, voting 74-26 in favor of the bill; and President Bush signed the bill (H.R. 6) into law on August 8, 2005 (PL 109-58).

Although the bill falls short of making energy efficiency a cornerstone of our nation's energy policy, there are several important energy-efficiency provisions that will help Americans save money and energy while reducing pollution. Below is a summary of the energy-efficiency measures in HR 6. For more detailed information, please see the full text of the bill, which can be found on the Alliance to Save Energy website at http://www.ase.org/uploaded_files/policy/Energy_Bill_Final.pdf.

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Buildings Energy Efficiency

Federal Building Energy Management:

Section 101 directs the Architect of the Capitol to develop a cost-effective energy conservation plan for congressional facilities, to be presented to Congress by February 4, 2006. The plan must include informational packets detailing ways to save energy at the workplace. The Architect of the Capitol also is directed to submit an annual report on congressional energy-efficiency measures.

Section 102 sets goals of reducing energy intensity (energy use per square foot) of the buildings of each federal agency by 2 percent per year from 2006-2015, compared to their 2003 energy use.

Section 103 directs all federal buildings to be metered by October 1, 2012, to the maximum extent practicable with advanced meters that track energy use at least hourly and provide data at least daily. No more than six months after the Department of Energy (DOE) sets guidelines for the agencies (which must be

done by February 4, 2006), each agency must submit a plan to DOE detailing how it intends to meet this requirement.

Section 104 requires federal agencies to purchase products rated for energy efficiency under the Energy Star program or designated as energy-efficient by the Federal Energy Management Program (FEMP) of DOE. DOE is to establish guidelines for this provision by February 4, 2006.

Section 105 extends the Energy Savings Performance Contracts (ESPC) program for federal buildings to September 30, 2016. This program allows federal agencies to partner with energy service companies that finance, install, and maintain new energy-efficient equipment in government facilities. The government pays for these energy-efficiency improvements using its utility savings. By law, the government pays no more per month for utilities and EPSC payments than it would have paid for utilities before the improvements. Once the energy companies have been paid in full, significantly lower utility bills result.

Voluntary Industrial Energy-Efficiency Agreements

Section 106 authorizes DOE to enter into voluntary agreements with members of the industrial sector to reduce the energy intensity of their production activities by at least 2.5 percent per year from 2007-2016. DOE will publicize the achievements of the industrial partners, who will be eligible for grants and technical assistance from DOE.

Advanced Building Efficiency Testbed Program

Section 107 establishes a DOE Advanced Building Efficiency Testbed program, to be led by a university, that will develop and test advanced energy-efficiency technologies for federal and industrial buildings. \$6 million per year is authorized for fiscal year (FY) 2006 – FY 2008 (\$18 million total).

Increased Federal Use of Recovered Mineral Components

Section 108 directs federal agencies to implement fully by August 8, 2006 procurement requirements and incentives for the use of recovered mineral components (waste material or byproducts) in cement or concrete projects. An Environmental Protection Agency (EPA) study is to examine the energy savings and environmental benefits of the procurement requirements. A report on the study must be submitted to Congress by February 8, 2008.

Federal Building Standards

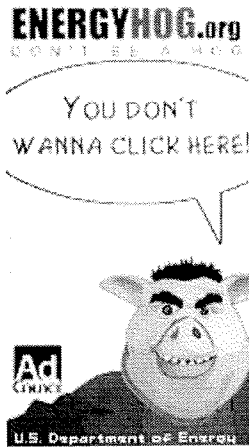
Section 109 requires federal buildings to meet the 2004 International Energy Conservation Code (IECC) for residential buildings and the ASHRAE Standard 90.1-2004 for commercial buildings. By August 8, 2006, DOE must establish building energy-efficiency standards that direct new federal buildings to use at least 30 percent less energy than mandated by either the ASHRAE standard or the IECC.

Daylight Savings Time Extension

Section 110 extends Daylight Savings Time three weeks in the spring and one week in the fall, starting in the spring of 2007. DOE must submit a report to Congress on the energy consumption impact of these changes by December 2007.

Increased Use of Energy Efficiency in Management of Federal Lands

Section 111 directs federal agencies to use more energy-efficient technologies when managing natural resources. Energy-efficient buildings and motor vehicles are to be incorporated as much as possible on federal lands.



Low-Income Energy Assistance Programs

Section 121 authorizes \$5.1 billion per year for FY 2005 – FY 2007 (\$15.3 billion total) to the Low-Income Home Energy Assistance Program (LIHEAP), which helps low-income households pay their energy utility bills. States can also use some of this funding for weatherization assistance.

Section 122 authorizes \$500 million for FY 2006, \$600 million for FY 2007, and \$700 million for FY 2008 to the Weatherization Assistance Program, which assists states in weatherizing low-income homes. It also changes the definition of “low-income” to include income levels up to 150 percent of the national poverty level.

State & Local Energy-Efficiency Programs

Section 123 directs DOE at least once every three years to invite each state to review and potentially revise its state energy conservation plan. For federal assistance each state energy conservation plan must include at least a 25 percent improvement in energy efficiency by 2012 as compared to 1990. Authorizes \$100 million per year for FY 2006 and FY 2007, and \$125 million for FY 2008 (\$325 million total) for State Energy Program grants.

Section 124 authorizes \$50 million per year for FY 2006 – FY 2010 (\$250 million total) to DOE for matching funding (up to 50 percent) for state programs to provide rebates to consumers for the purchase of residential Energy Star appliances to replace used appliances.

Section 125 authorizes \$30 million per year for FY 2006 – FY 2010 (\$150 million total) to DOE to provide grants to state energy offices to assist local government units in improving energy efficiency in public buildings and facilities through construction or renovation of public buildings that use at least 30 percent less energy than mandated by the IECC or than baseline energy use.

Section 126 authorizes \$20 million per year for FY 2006 – FY 2008 (\$60 million total) to DOE to award grants to local governments, non-profit community development organizations, and Indian tribe economic development entities to improve energy efficiency and develop alternative energy in low-income rural and urban communities.

Section 127 authorizes the existing State Technologies Advancement Collaborative (STAC), a cooperative program of DOE and the states (the National Association of State Energy Officials and the Association of State Energy Research and Technology Transfer Institutions) for research and development of energy efficiency, renewable energy, and fossil energy technologies. Such funds as necessary are authorized for FY 2006 – FY 2010.

Section 128 authorizes \$25 million per year for FY 2006 – FY 2010 (\$125 million total), and such sums as necessary for FY 2011 and later, to DOE for assistance to states in setting and implementing building energy-efficiency codes. Up to one half of appropriated funds above \$5 million each year can be used for a new program to fund state implementation of plans to achieve and document at least a 90 percent compliance rate with the codes. To qualify for the new program, states must have adopted both a residential code that meets or exceeds the 2004 IECC, and a commercial building code that meets or exceeds ASHRAE Standard 90.1-2004. For states in which there is no statewide code, the money can go to local governments that meet the above standards.

Energy Star Program

Section 131 authorizes the existing Energy Star program under DOE and EPA. Energy Star identifies, labels, and promotes energy-efficient products and buildings. The provision requires Energy Star regularly to update its criteria, and sets transparency and lead-time requirements. It also requires DOE to set new energy-efficiency qualifications for clothes washers and for dishwashers by

January 1, 2006, effective January 1, 2007 (these criteria are used for the tax incentives in Sec. 1334). New energy-efficiency qualifications for clothes washers would again be required by January 1, 2008, effective January 1, 2010.

Energy-Efficiency Public Education

Section 132 directs DOE by February 4, 2006 to carry out a program to educate homeowners and small business owners on proper maintenance of air conditioning, heating, and ventilation systems, to ensure maximum efficiency. Also, the Small Business Administration, with DOE and EPA, must develop a program to help small businesses become more energy-efficient, building on Energy Star for Small Businesses. As part of this program they may create a Small Business Energy Clearinghouse to provide resources for small businesses seeking to become more energy-efficient. Such sums as necessary are authorized.

Section 133 directs DOE to convene a conference by February 4, 2006 to establish an ongoing, self-sustaining national public energy education program. Representatives from industrial firms, professional societies, educational organizations, trade associations and governmental agencies will be invited. The program will examine energy efficiency, the role of energy use in the economy, and the impact of energy use on the environment. Such sums as necessary are authorized.

Section 134 directs DOE to carry out a comprehensive energy-efficiency public information campaign, including advertising and media awareness, to inform consumers about the need to reduce energy consumption, benefits to consumers and the economy, and ways of doing so. Specific measures are to include maintaining and repairing heating and cooling ducts and equipment, weatherizing homes and buildings, purchasing energy efficient products, and proper tire maintenance. A report detailing the effectiveness of the program must be submitted to Congress by July 1, 2009, and the program will end December 31, 2010. \$90 million per year is authorized to the DOE for FY 2006 – FY 2010 (\$450 million total).

Appliance Energy-Efficiency Standards

Section 135 establishes new federal appliance efficiency standards. New standards are legislated for ceiling fan light kits, dehumidifiers, unit heaters, torchiere lamps, medium base compact fluorescent lamps, 34-W fluorescent lamp ballasts, mercury vapor lamp ballasts, illuminated exit signs, traffic signals and pedestrian signals, commercial prerinse spray valves, and low voltage dry-type distribution transformers.

In addition, DOE is directed to develop standards for vending machines by August 8, 2009, and for additional kinds of ceiling fan light kits by January 1, 2007. DOE is to determine whether to set standards for battery chargers and external power supplies by August 8, 2008. DOE is given the authority to regulate ceiling fan air circulation, furnace fans, and products that serve more than one function. In addition, DOE is to determine whether to update the dehumidifier standard by October 1, 2009.

The provision sets associated definitions and test procedures, or directs DOE to issue them. It preempts state standards and labeling upon enactment of new legislated standards, and when a final rule is issued setting other standards, except that preexisting state laws are usually preempted only when the federal standard takes effect.

Section 136 legislates energy-efficiency standards on commercial package air conditioning and heating equipment; commercial refrigerators, freezers, and refrigerator-freezers; automatic commercial ice makers; and commercial clothes washers.

It also directs DOE to set standards on ice-cream freezers, self-contained commercial freezers, refrigerator-freezers without doors, remote condensing commercial refrigerators, freezers, and refrigerator-freezers by January 1, 2009, and gives DOE authority to set standards for other such products and for other ice makers. It requires DOE to determine whether to update most of the standards. And it sets associated definitions and test procedures.

Product Energy-Efficiency Labels

Section 137 directs the Federal Trade Commission (FTC) to commence a rulemaking by November 6, 2005 that considers the effectiveness of consumer products labeling in assisting consumers to make energy-efficient purchasing decisions, and considers changes to the labeling rules that could improve their effectiveness. The rulemaking must be completed by August 8, 2007. A rulemaking also must be done by the FTC on labeling requirements for ceiling fans by February 8, 2007. FTC is given the authority to label other newly covered products except dehumidifiers.

Intermittent Escalators

Section 138 directs the General Services Administration (GSA) to conduct a study on the pros and cons of using intermittent escalators (escalators that only run at the approach of a passenger). The study will address the prospective energy savings and cost savings that would result from their use. A report on the study must be submitted to Congress by August 8, 2006.

State and Utility Energy-Efficiency Programs

Section 139 directs DOE, with the National Association of Regulatory Utility Commissioners and the National Association of State Energy Officials, to conduct a study of state and regional policies that promote electric and natural gas demand-side management programs run by regulated and nonregulated utilities. The study is to include consideration of performance standards, funding sources, infrastructure planning, consumer education, and returns on and disincentives for such programs. DOE must submit a report to Congress on the study by August 8, 2006.

Section 140 directs DOE to establish a pilot program under which it will give financial assistance to 3-7 states to carry out energy-efficiency programs that reduce consumption of electricity or natural gas in the state by at least 0.75 percent per year. \$5 million per year is authorized for these programs for FY 2006 – FY 2010 (\$25 million total).

DOE Report on Missed Deadlines for Energy-Efficiency Standards

Section 141 directs DOE to submit a report to Congress by February 8, 2006 for every new or revised energy-efficiency or water use standard that DOE has failed to issue by the set deadlines. The report will explain the reasons for the missed deadlines and set a new timetable. Every six months following the report – until the adoption of the new standard – a new report must be submitted describing DOE's progress.

Energy Efficiency in Public Housing

Section 151 permits funds from the Public Housing Capital Fund to be used for improvements to increase energy and water use efficiency in public housing. It also clarifies the authority of public housing agencies to enter into energy-efficiency contracts and to retain the savings.

Section 152 directs public housing agencies to purchase appliances designated by Energy Star or by FEMP as energy-efficient, unless it is not cost-effective.

Section 153 requires new and rehabilitated public housing that is funded by HOPE VI revitalization grants to meet the 2003 IECC by September 30, 2006, or to meet a standard that the Department of Housing and Urban Development (HUD) sets.

Section 154 requires HUD to develop a strategy to reduce utility costs through energy-efficiency measures and energy-efficient design and construction of public and assisted housing. A report on the strategy must be submitted to Congress by August 8, 2006, and must be updated every two years.

Transportation Efficiency

Federal Alternative Fuel Vehicle Requirements

Section 701 requires federal dual-fuel vehicles (which can run either on gasoline or diesel or on an alternative fuel such as ethanol) that are used to meet alternative fuel vehicle (AFV) requirements to be operated on the alternative fuel.

Section 703 allows states and alternative fuel providers (mostly utilities) to ask DOE for a waiver of AFV requirements if they can achieve the same petroleum savings through some other means, while remaining in compliance with all relevant vehicle emission standards. Fleets with waivers must report to DOE by December 31 every year on their fuel savings.

Section 704 requires DOE to submit to Congress, by February 4, 2006, a study on the effect that the Energy Policy Act of 1992 has had on developing AFV technology, on increasing its availability in the market, and on the cost of AFVs.

Hybrid Vehicle Provisions

Section 706 directs DOE to establish a grant program to improve technologies for the commercialization of hybrid flexible fuel vehicles and plug-in hybrid flexible fuel vehicles. DOE is directed to issue a report to Congress by April 15, 2006 and annually thereafter. Authorizes \$3 million for FY 2006, \$7 million for FY 2007, \$10 million for FY 2008 and \$20 million for FY 2009 (\$40 million total).

Section 711 directs DOE to step up efforts to improve technologies used in hybrid vehicles.

Section 712 directs DOE to establish a program, including grants to automakers, to encourage domestic production of efficient hybrid and advanced diesel vehicles, and authorizes such sums as necessary for FY 2006 – FY 2015 for this program.

Clean Cities Pilot Program

Sections 721-723 direct DOE, with DOT, to establish a competitive grant pilot program through the Clean Cities Program to provide up to 30 grants to state and local governments and transportation authorities to acquire alternative fuel, fuel cell, or hybrid vehicles; install fueling and other infrastructure; and conduct operation and maintenance. The maximum amount of a grant will be \$15 million over no more than five years, and the grant cannot pay for more than half of the project cost. DOE is to issue a report to Congress on the grants. In addition, by August 8, 2008, and every year thereafter, DOE is to submit to Congress a report evaluating the effectiveness of the program. Authorizes a total of \$200 million for these grants.

Railroad Efficiency

Section 751 directs DOE, with DOT and EPA, to establish a public-private research partnership with railroad carriers, locomotive manufacturers, equipment suppliers and the Association of American Railroads to develop railroad efficiency measures to increase fuel economy, reduce emissions, and lower costs. \$15 million is authorized for FY 2006, \$20 million for FY 2007, and \$30 million for FY 2008 (\$65 million total).

Aviation Fuel Conservation

Section 753 directs the Federal Aviation Administration and EPA to initiate a study by October 7, 2005 to investigate the impact of aircraft emissions on air quality in non-attainment areas, ways to promote fuel conservation measures for aviation, and opportunities to reduce air traffic inefficiencies. A report must be submitted to Congress within a year.

Diesel Fueled Vehicles

Section 754 directs DOE to step up efforts to improve diesel technologies in order to meet Tier 2 emission standards and the heavy-duty emissions standards by 2010, and to develop new, more efficient diesel engines.

Bicycle Program

Section 755 establishes the "Conserve by Bicycling Program" in DOT. The program creates up to ten pilot programs designed to encourage bicycle use in place of motor vehicles. At least 20 percent of the cost of each project must be provided by non-Federal sources. Furthermore, by August 8, 2007, the National Academy of Sciences must submit to Congress a report on the feasibility of converting motor vehicle trips to bicycle trips and on the pilot programs. \$6.2 million is authorized to these programs, of which \$5.15 million is for pilot projects, \$300,000 is for program costs, and \$750,000 is for the study.]

Engine Idling Reduction

Section 756 directs EPA to begin a review by November 6, 2005 on mobile source air emission models used under the Clean Air Act to determine if the models accurately reflect the emissions of long-duration idling of heavy-duty vehicles. If necessary, both the models and regulations are to be updated to ensure that the emission reductions are being achieved by idle reduction technology. The reviews must be completed and reported by February 4, 2006.

It also directs EPA, with DOT, by November 6, 2005 to establish a program through EPA's SmartWay Transport Partnership to support deployment of idle reduction and energy conservation technologies. 50 percent of all costs must be paid for by non-Federal sources. \$19.5 million is authorized for FY 2006, \$30 million for FY 2007, and \$45 million for FY 2008 for heavy-duty vehicles (\$94.5 million total). \$10 million is authorized for FY 2006, \$15 million for FY 2007 and \$20 million for FY 2008 for locomotives (\$45 million total).

By February 4, 2006 EPA, with DOT, must complete and report on a study to analyze all locations at which heavy-duty vehicles stop for long-duration idling.

Ultra-Efficient Engine Technology for Aircraft

Section 758 directs DOE and NASA to partner to develop ultra-efficient engine technology for aircraft, with goals of at least a 10 percent fuel efficiency increase, a 70 percent reduction in NOx air quality impacts, and exploring fuel cells and alternate fuels. \$50 million annually is authorized from FY 2006 – FY 2010 (\$250 million total).

CAFE Standards

Section 759 requires that dual-fuel vehicles, which can run either on gasoline or diesel or on an alternative fuel such as ethanol, be labeled as such by September 1, 2006 in order to be eligible for the Corporate Average Fuel Economy (CAFE) standards credit.

Section 771 authorizes \$3.5 million per year for FY 2006 – FY 2010 (\$17.5 million total) to the National Highway Traffic Safety Administration (NHTSA) to set and enforce CAFE standards.

Section 772 extends the CAFE standards credit for dual-fuel vehicles through 2010, and allows NHTSA to further extend it through 2014.

Section 773 directs NHTSA to study the feasibility and effects of significantly reducing fuel use for automobiles by model year 2014. The study must include examination of and recommendations for alternatives to CAFE standards, how automakers can contribute, the potential of fuel cell technology, and the effects such a reduction would have on gasoline supplies, the automobile industry, motor vehicle safety, and air quality. The report must be initiated by September 7, 2005 and concluded by August 8, 2006.

Section 774 directs EPA to update the adjustment factors used in reporting fuel economy testing (but not in CAFE compliance) to consider higher speed limits, faster acceleration rates, temperature variations, use of air conditioning, shorter city driving times, current fuels, and other fuel depleting features.

Energy-Efficiency Research and Development

Energy-efficiency R&D

Section 911 authorizes DOE energy-efficiency research, development, demonstration, and commercial application (RDD&CA) programs, with the objectives of increasing the energy efficiency of vehicles, buildings, and industrial processes; reducing U.S. demand for energy, especially foreign energy; reducing the cost of energy and making the economy more efficient and competitive; improving energy security; and reducing the environmental impact of energy-related activities. \$783 million is authorized for FY 2007, \$865 million for FY 2008, and \$952 million for FY 2009 for these programs (\$2.6 billion total). It also specifies sub-allocations for vehicles, solid-state lighting, electric vehicle battery use, and motors.

Section 912 directs DOE, with an industry alliance, to carry out a Next Generation Lighting Initiative on solid-state lighting RDD&CA, with periodic review by the National Academy of Sciences.

Section 913 directs the Office of Science and Technology Policy by November 6, 2005 to establish an interagency group under DOE and the Department of Commerce, and establish an advisory committee, to integrate federal, state, and private sector efforts to reduce building costs. The group is to submit an RDD&CA plan to Congress by August 8, 2006.

Section 914 directs DOE by December 6, 2005 to contract with the National Institute of Building Sciences to assess current voluntary consensus standards and rating systems for high performance buildings and recommend steps for further development. It also directs DOE to establish a grant and technical

assistance program for such voluntary standards.

Section 915 directs DOE to establish an RDD&CA program for the secondary use of electric and hybrid vehicle batteries.

Section 916 authorizes the Energy Efficiency Science Initiative for competitive energy-efficiency research grants, and requires an annual report to Congress.

Section 917 directs DOE to establish an advisory committee and to make grants to establish a network of Advanced Energy Efficiency Technology Transfer Centers, which are to encourage demonstration and commercial application of methods and technologies that promote energy efficiency.

Distributed Energy and Electric Energy Systems R&D

Section 921 authorizes distributed energy and electric energy systems RDD&CA. \$240 million is authorized for FY 2007, \$255 million for FY 2008, and \$273 million for FY 2009 (\$768 million total).

Section 922 directs DOE to conduct RDD&CA to improve the energy efficiency of high power density facilities such as data centers, server farms, and telecommunications facilities.

Section 923 directs DOE to make competitive grants to consortia for the development of micro-cogeneration technology, including residential combined heat and power.

Section 924 authorizes DOE to provide financial assistance to consortia for demonstrations of distributed energy technologies in commercial applications. It also directs DOE to establish an RDD&CA program on small scale portable power devices.

Section 925 authorizes RDD&CA programs on electrical transmission and distribution systems, including transmission, load reduction, advanced metering and load management, superconductor, distributed power generation, and other technologies. Requires a 5-year plan by August 8, 2006, and a report two years later.

Electric Utility Energy-Efficiency

Advanced Technologies

Section 1223 directs the Federal Energy Regulatory Commission (FERC) to encourage deployment of advanced transmission technologies that increase the capacity, efficiency, or reliability of transmission facilities.

Section 1224 authorizes DOE to pay an incentive of 1.8 cents/kWh for a fuel cell, turbine, or hybrid power system or power storage system. Authorizes \$10 million per year for FY 2006 – FY 2012 (\$50 million total).

Economic Dispatch Study

Section 1234 directs DOE, with the states, to conduct a study on current electric utility economic dispatch procedures, possible revisions to improve the ability of nonutility generation to be included in economic dispatch, and the potential benefits to consumers. A report is to be submitted to Congress by November 6, 2005 and every year thereafter, including recommendations to Congress and the states.

Net Metering

Section 1251 requires states and nonregulated utilities by August 8, 2008 to consider adopting a standard requiring electric utilities to make net metering service, in which customers with on-site generation are billed only for the net electricity provided by the utility, available to all of their consumers. Each electric utility would also have to develop a plan to minimize dependence on a single fuel source, and develop a 10-year plan to increase the efficiency of its fossil fuel generation.

Smart Metering and Demand Response

Section 1252 requires states and nonregulated utilities by August 8, 2007 to consider adopting a standard requiring electric utilities to offer all of their customers a time-based rate schedule such as time-of-use pricing, critical peak pricing, real-time pricing, or peak load reduction credits. Electric utilities would also have to provide time-based meters and communications devices to their customers.

DOE is responsible for educating consumers on advanced metering, funding pilot projects, addressing barriers to demand response, and reporting to Congress by February 4, 2006 on the benefits of demand response and on recommendations for specific levels.

States the policy of the United States is to encourage demand response and to encourage states to coordinate energy policies on a regional basis to provide demand response services. DOE is to provide technical assistance to states and regional organizations, and FERC is to report to Congress annually on demand response resources, programs, actions, and barriers.

Cogeneration Purchase and Sale Requirements

Section 1253 ends a requirement that utilities purchase power from cogeneration and renewable electricity facilities when those facilities have fair access to wholesale markets for capacity and electricity. It also ends a requirement that utilities provide such facilities with electricity when competing retail suppliers can serve those facilities.

Interconnection Standards

Section 1254 requires states and nonregulated utilities by August 8, 2007 to consider adopting a standard requiring electric utilities to provide interconnection service to all their consumers, under which a consumer's on-site generating facility is connected to the utility's local distribution facilities.

Economic Dispatch Regional Boards

Section 1298 directs FERC to convene regional boards to study the issue of security constrained economic dispatch for different market regions. FERC is to report to Congress by August 8, 2006 on the boards' recommendations.

Energy-Efficiency Tax Incentives

Commercial Buildings

Section 1331 creates a tax deduction for new and renovated commercial buildings designed to use at least 50 percent less energy than mandated in the ASHRAE Standard 90.1-2001. The amount of the deduction is up to \$1.80 per square foot

of building space; a smaller deduction is available for each of three building systems—the building envelope, HVAC and hot water, or lighting system—that meets comparable targets to be set by the IRS. Certification with inspection and testing is required. For government-owned buildings, the designer may take the credit. The credit will be available for buildings “placed in service” starting January 1, 2006 and will expire on December 31, 2007.

New Homes

Section 1332 creates a tax credit for the builders of new energy-efficient homes. The credit is equal to \$2,000 for homes that use at least 50 percent less energy than mandated in the 2004 IECC code (with at least 1/5 of the improvement due to the building “envelope”), and \$1,000 for manufactured homes either that use at least 30 percent less energy than mandated in the 2004 IECC, or that meet the requirements to be an Energy Star Labeled Home. Certification is required. The credit will be available for homes “placed in service” starting on January 1, 2006 and will expire on December 31, 2007.

Residential Energy Property

Section 1333 creates a tax credit for homeowners who improve the energy efficiency of their homes. The credit has an overall lifetime cap of \$500 per taxpayer. It includes the purchase and installation of:

- Exterior windows (including skylights): 10 percent of the cost, up to \$200. Insulation, exterior doors, or pigmented metal roofs: 10 percent of the total cost, up to \$500. Duct sealing and weather stripping or foam sealants may qualify for the credit, depending on the IRS rules.
- Central air conditioner, heat pump, or water heater: up to \$300 towards the full purchase price.
- Furnace or boiler: up to \$150 towards the full purchase price, and/or \$50 for an efficient air circulating fan.
- The insulation, windows, and doors must meet the requirements of the IECC model building energy code. The heating and cooling equipment must meet stringent efficiency requirements. The credit will be available for improvements “placed in service” starting on January 1, 2006 and will expire on December 31, 2007.

Appliances

Section 1334 creates a tax credit for manufacturers of energy-efficient appliances. The credit is \$100 for clothes washers; between \$75 and \$175 for refrigerators, depending on their efficiency; and up to \$100 for dishwashers, depending on forthcoming Energy Star criteria. It only applies to increased production of eligible appliances over a three-year rolling baseline. There is an overall lifetime cap of \$75 million per manufacturer, including a \$20 million cap on the least efficient eligible refrigerators. The credit will be available for appliances produced starting on January 1, 2006 and will expire on December 31, 2007.

Residential Solar Equipment and Fuel Cells

Section 1335 creates a tax credit for individuals who purchase solar photovoltaic cells, solar water heaters, and fuel cells to provide electricity or hot water for their homes. The credit is equal to 30 percent of the cost of the equipment, up to \$2,000 each for photovoltaic cells and solar water heaters, and \$500 for each half kilowatt of capacity of fuel cell property. Certain efficiency requirements apply. The credit will be available for equipment “placed in service” starting on January 1, 2006 and will expire on December 31, 2007.

Business Solar Equipment, Fuel Cells, and Microturbines

Section 1336 creates a tax credit for businesses that install energy-efficient fuel cells and stationary microturbine power plants. The credit for fuel cells is 30 percent of the cost, up to \$500 per half kilowatt of capacity (like the residential credit). The credit for microturbines is 10 percent of the cost, up to \$200 per kilowatt of capacity, with a limit of 2000 kW. Certain efficiency requirements apply. The credit will be available for equipment "placed in service" starting on January 1, 2006 and will expire on December 31, 2007.

Section 1337 modifies a tax credit for businesses that install solar equipment. The credit will be for 30 percent of the cost, and will apply to hybrid solar lighting systems, as well as solar electricity, heating, cooling, and water heating systems. The modifications will apply for equipment "placed in service" from January 1, 2006 through December 31, 2007.

Alternative Motor Vehicles

Section 1341 creates tax credits for purchasers of hybrid, diesel, alternative fuel, and fuel cell motor vehicles.

The credit for new hybrid and advanced lean burn diesel cars and light trucks ranges from \$250-\$3,400, based on fuel economy and lifetime fuel savings compared to typical vehicles of similar weight. For new hybrid vehicles weighing more than 8,500 pounds, the credit will equal 20-40 percent of the additional cost of the hybrid vehicle compared to a comparable non-hybrid vehicle, with a cap of \$7,500-\$30,000 depending on the weight of the vehicle. Certain emissions requirements apply.

The credits for hybrid and diesel vehicles will be available for vehicles "placed in service" starting on January 1, 2006. The credit will be phased out separately for vehicles produced by each manufacturer. After a company has sold 60,000 eligible vehicles, the credit for that company's vehicles will be gradually reduced over the course of another year. The credit also will expire on December 31, 2009 for heavy-duty vehicles and December 31, 2010 for light-duty vehicles.

The credit for a new alternative fuel motor vehicle credit is equal to 50-80 percent of the additional cost of the alternative fuel vehicle compared to a traditionally-fueled vehicle, depending on the vehicle's air emissions, with a cap of between \$5,000 and \$40,000, depending on the vehicle's weight. The credit will be available for vehicles "placed in service" starting on January 1, 2006 and will expire on December 31, 2010.

The credit for a new fuel cell motor vehicle ranges from \$4,000-\$12,000 for cars and light trucks, depending on the year and fuel efficiency of the vehicle. The credit for vehicles over 8,500 pounds is \$10,000-\$44,000. The credit will be available for vehicles "placed in service" starting on January 1, 2006 and will expire on December 31, 2014.

Innovative Technology Incentives:

Sections 1701-1704 authorize DOE to make loan guarantees for up to 80 percent of the cost of projects that avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases and that employ new or improved technologies compared to existing commercial technologies. Eligible projects include efficient end-use energy technologies, production facilities for fuel efficient vehicles, efficient electric system technologies, and fuel cell technology, among others. Authorizes such sums as are necessary for these loan guarantees.

Studies

Site and Source Energy Measurement

Section 1802 directs DOE to contract with the National Academy of Sciences (NAS) for a study to be completed by August 8, 2006 on whether energy use should be measured for energy-efficiency standards at the site of use or through the fuel cycle beginning at the source of energy production.

Telecommuting

Section 1803 directs DOE, with FERC, the Office of Personnel Management, GSA, and the Department of Commerce, to study the energy conservation implications of widespread telecommuting by federal employees, along with regulatory barriers and other benefits. A report to the president and to Congress is required by February 8, 2006.

Vehicle Oil Saving Technologies

Section 1805 directs DOE and EPA to study oil bypass filtration technology and its use in federal fleets. Section 1806 directs DOE to study total integrated thermal systems and their use in federal fleets.

Distributed Generation

Section 1817 requires DOE, with FERC, to study cogeneration and distributed generation, and, after public comment, to report to the president and Congress by February 8, 2007.

Natural Gas Shortage

Section 1818 requires DOE by February 4, 2006 to report to Congress with recommendations for achieving a balance between natural gas supply and demand, with recommendations including encouraging or requiring the use of energy conservation or demand side management practices.

Vehicle Miles Traveled

Section 1827 requires DOE to have NAS study, and by August 8, 2007 report to DOE and Congress on, the impact of land development patterns on vehicle miles traveled and on petroleum use, and the potential benefits of information programs and transportation policies and strategies.

Congressional Buildings

Section 1829 requires the Architect of the Capitol to study, and by February 4, 2006 report to Congress on, how to make the Capitol complex more energy efficient, and the feasibility of installing a garden and distributed generation on the Dirksen Senate Office Building Rooftop. Authorizes \$2 million a year for FY 2006 – FY 2010 (\$10 million total).

Economic Dispatch

Section 1832 directs DOE to do the same study as in Sec. 1234.

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APPENDIX B

OEPA 2005

Large NOx Emitters Tons/yr

County	Facility #	Facility Name	1999	2000	2001	2002	2003	2004
Lake	0243160009	CEI Eastlake	18200	14552	13251	20667	19766	8968.00
Lorain	0247030013	Avon Plant	19105	11851	10406	17871	14093	5804.00
Trumbull	0278060023	Niles Plant	6332	5976	4449	5846	5960	4632.00
Wayne	0285010188	Orville Utilities	1414.3	2164	1964	1780.7	1763.89	1982.00
Ashtabula	0204010000	CEI Ashtabula	1982	2669	3028	2800	1691	1492.00
Trumbull	0278000463	WCI	1046.14	973.14	910	965.13	885.34	973.93
Summit	1677010193	Goodyear	789.45	895.43	884.3	839.99	1049.66	882.10
Lake	0243110008	Panesville Muny	841.9	745.9	730.21	869.13	846.9	831.06
Wayne	0285000366	Dominion Gas	831.42	835.23	800.54	723.32	840.31	802.15
Lake	0243030257	Carmeuse	553.15	532.67	467.78	108.84	420.46	420.46
Summit	1677010757	Akron Thermal	474.98	449.69	367.67	374.16	393.79	412.38
Wayne	0285020059	Morton	267.8	269.9	273.36	263.67	269.93	261.37
Lorain	0247080229	Republic Lorain	307.52	448.92	281.92	237	185.7	241.82
Trumbull	0278000648	ISG Warren	194.84	190.77	179.39	152.95	242.9	237.92
Ashtabula	0204010193	Millenium #2	209.2	158.86	195.03	203.46	197.76	201.06
Mahoning	0250050996	Carbn Lmst Gas			40.26	133	138	192.67
Lake	0243160086	GE Willoughby	125.75	155.35	173.85	178.94	94.66	178.07
Wayne	0285020076	Caraustar	519.39	321.87	287.95	210.53	171.91	171.55
Mahoning	0250110625	V & M Star	224.93	156.52	146.15	116.2	125.96	161.93
Lake	0243150025	Lubrizol (Wick)	96.95	17.15	138.73	121.12	114.81	142.94
Mahoning	0250110024	Yngstn. Thermal	167.16	167.86	168.44	139.92	148.26	137.71
Lorain	0247050278	Ross Incinerator	120.07	104.54	108.24	113.22	143	128.27
Summit	1677010029	Noveon	122.8	134.63	115.72	111.36	118.18	115.19
Lorain	0247080487	West Lorain Plan	76.89	103.94	102.7	112.55	113.14	107.48
Summit	1677010027	Cargill Salt	94.66	82.18	80.86	93	89.21	88.96
Trumbull	0278000199	GM Assembly	134.41	130.25	119.01	103.34	92.73	77.06
Lorain	0247030471	Ford Truck Plant	79.26	75.74	61.16	68.96	68.83	75.46
Portage	1667040085	Kent State Univ	60.93	57.44	60.82	39.69	40.47	41.58
Medina	1652050071	Columbia Gas	39.65	40.67	62.58	53.24	70.56	41.32
Ashtabula	0204010200	Millenium #1	73.3	74.19	40.66	35.81	37.6	36.89
Trumbull	0278000013	Denman Tire	86.03	100.72	80.54	42.53	40.5	36.71
Wayne	0285030180	Wooster College	25.58	26.67	28.25	31.59	33.85	34.28
Medina	1652050040	Owens Corning	23.32	29.65	30.05	30.71	27.53	33.92
Mahoning	0250110501	Yngstn. WWTP	22.19	22.9	20.1	21.68	22.01	21.79
Mahoning	0250070850	Carbn Lmst Fill	37.44	40.73	31.49	4.11	13.51	20.04
Medina	1652050059	3M	0	0	0	0	6.37	7.67
Ashtabula	0204030303	USA Waste				5.01	5.06	7.01
Geauga	0228000186	Kraftmaid					6.12	6.80
Ashtabula	0204010003	Elkem	95.47	87.85	79.45	79.45	45.36	3.84
Geauga	0228000213	Kraftmaid						1.97
Geauga	0228000046	Johnson Rubber	4.95	6.24	4.08	4.64	4.64	0.00
Cuyahoga								
Erie								
Huron								
Ashland								
Stark								

PERMIT FEE DATABASE

County	Facility #	Facility Name	Large VOC Emitters		Tons/Yr			
			1999	2000	2001	2002	2003	2004
Ashtabula	0204010003	Elkem	1385	1385	1329	1758	1745	1642.00
Trumbull	0278000199	GM Assembly	1871.25	1791.29	1783.7	1791.9	1647.8	1451.30
Lorain	0247030471	Ford Truck Plant	1112.47	953.19	651.65	679.15	583	722.73
Trumbull	0278080136	Novelis	80.04	85.8	90.73	88.52	87.5	245.56
Portage	1667040037	Smithers-Oasis	255.48	231.69	224.98	247.46	228.05	223.84
Summit	1677110026	Morgan Adhesives	410.64	218.11	195.19	222.27	208.19	184.41
Trumbull	0278000013	Denham Tire	126.6	117.4	123.6	140.86	122.44	139.11
Medina	1652050040	Owens Corning	80.7	73.87	58.55	74.27	63	112.15
Ashtabula	0204010200	Plastic Eng. Prod	141.53	111.75	70.36	60.07	89.55	110.61
Lorain	0247080961	Lorain Tubular	88.24	80.63	109.73	85.5	58.36	101.01
Trumbull	0278020021	Indalex	57.73	59.96	92.21	94.74	94.71	95.51
Lake	0243160009	CEI Eastlake	65.74	71.58	71.96	94.63	91.4	92.67
Mahoning	0250110100	Spectrum	48.5	79.3	67.83	59.66	55.83	89.30
Summit	1677010932	SIA Adhesives	24.85	11.1	35.68	44.07	60.71	83.90
Wayne	0285010001	Quality Castings	94.8	88.54	79.99	70.44	62.44	79.20
Summit	1677000105	Pechiney Plastics	205.93	166.1	137.41	154.53	172.08	78.80
Trumbull	0278080139	Excel	114.1	85	79.53	76.76	79.84	78.73
Lake	0243020004	Equistar	99.1	110.2	52.68	54.5	43.39	74.29
Lorain	0247040822	Nylonge	62.3	63.6	58.47	65.62	70	72.36
Ashtabula	0204010230	MFG Plant 2	92.96	70.44	51.39	51.11	61.6	61.83
Portage	1667060021	White Rubber	310	409(OC)	450(OC)	410. (OC)	66.6(OC)	52.20
Mahoning	0250110856	Epco	37.56	34.85	29.92	34.3	37.76	51.56
Lake	0243110099	A-D Bldg 3		62.35			51.44	49.56
Wayne	0285020076	Caraustar	26.79	29.26	23.23	46.48	55.77	48.71
Portage	1667030018	Amweld Building	37.7	33.6	38.9	40.2	41.91	42.60
Lake	0243000024	Lubrizol Paines.	117.22	107.26	49.7	41.87	31.63	39.51
Lake	0243081155	Ohio Sealants	149.51		40.95	39.86	48.65	39.21
Lorain	0247030013	Avon Plant	0	0	43.36	52.8	48.17	34.10
Wayne	0285030351	Seaman	24.35	24.81	27.53	19.56	24.8	30.67
Ashtabula	0204010423	Pickens Plastic	30.71	31.9	26.9	29.92	26.15	30.51
Mahoning	0250000044	Quaker Mfg			10.02(OC)	12.43	18.65	29.85
Summit	1677010193	Goodyear	23.07	10.13	11.46	24.7	36.67	29.67
Wayne	0285000366	Dominion Gas	29.78	29.6	28.85	20.56	27.37	29.30
Portage	1667020035	Omega Pultrusion	33.52	39.39	41.06	37.02	37.3	29.26
Wayne	0285010034	Ross Sand Casting	47.66	44.32	41.1	46.56	27.36	26.34
Ashtabula	0204000133	Premix	28.06	15.93	54.67	35.44	31.75	25.60
Medina	1652050059	3M	25.78	26.66	19.05	12.04	14.79	25.43
Mahoning	0250070850	Carbn Lmstn Fill	42.8	43.05	39.9	14.45	18.61	20.91
Lorain	0247080229	Repubic Lorain	20.33	74.28	13.15	16.53	14.63	18.10
Mahoning	0250090626	Astro Coating	40.17	28.21	59.83	39.15	48.09	17.76
Lorain	0247080234	Ford Assembly	13.66	10.19	5.66	12.87	14.05	16.25
Medina	1652080002	Inflat. Surv. Systm	7.5	11.7	18.9	16.1	24.65	12.28
Ashtabula	0204020245	Venture Holdings	59.1	36.22	18.2	14.88	8.21	7.45
Medina	1652050071	Columbia Gas	1.79	1.84	2.84	2.58	3.42	1.99
Cuyahoga								
Medina	1667000047	Plasti-Kote				22.84		
Portage	1667000047	Press of Ohio				22.84		
Geauga	0228000245	Creative Mold			3.05(OC)	1.92(OC)	1.6(OC)	7.9(OC)
Geauga	022800127	Sajar Plastics	8.1 (OC)	8.3(OC)	9.4(OC)	8.1(OC)	6.6(OC)	5.7(OC)

Geauga	0228000001	Schloss #3			8.75(OC)		4.79(OC)	4.58(OC)
Ashtabula	0204000360	Kraftmaid						26.06(OC)
Geauga	0228000213	Kraftmaid						22.06(OC)
Geauga	0228000186	Kraftmaid					8.92(OC)	17.32(OC)
Geauga	0228000046	Johnson Rubber	21.44(OC)	22.75(OC)	14.97(OC)	7.54(OC)	6.23(OC)	1.8(OC)
Erie								
Huron								
Ashland								
Stark								

PERMIT FEE DATABASE

Nox Emissions

Premise Number	Facility Name	2000	2001	2002	2003	2004
1318001613	ISG CLEVELAND INC.	1,818	1,469	1,315	2,193	2,091
1318000245	CLEVELAND ELECTRIC ILLUMINATING CO., LAKE SHORE PL	956	1,059	1,430	1,315	1,387
1318000246	CLEVELAND THERMAL LLC	247	251	584	300	282
1318170235	FERRO CORPORATION - CLEVELAND FRIT PLANT	202	190	219	217	233
1318120180	FORD MOTOR COMPANY, CLEVELAND CASTING PLANT	324	254	245	250	203
1318003059	Medical Center Company	181	180	165	179	182
1318172479	SOUTHERLY WASTEWATER TREATMENT CENTER	107	108	126	125	128
1318270383	DiGeronimo Aggregates	75	65	69	66	128
1318170314	ALCOA-CLEVELAND WORKS	81	74	77	74	74
1318004311	CLEVELAND CLINIC FOUNDATION	59			59	57
1318452983	PARMA COMMUNITY GENERAL HOSPITAL	38	38	37	37	37
1318120179	FORD MOTOR CO CLEVELAND ENGINE PLANT 1	34	37	22	27	35
1318394002	SOUTHWEST GENERAL HEALTH CENTER	36	36	36	36	35
1318001169	NASA JOHN H. GLENN RESEARCH CENTER - LEWIS FIELD	28	28	25	30	26
1318451029	GMC MFD PARMA PLANT- PARMA	26	20	20	19	24
1318538151	MM CUYAHOGA ENERGY LLC	23	24	23	20	24
1318007258	CCC				3	23
1318002480	Westerly WWTP				23	22
1318202137	THE LINCOLN ELECTRIC COMPANY	29	44	35	79	22
1318281215	ADVANCED ENERGY TECHNOLOGY INC	45	41	38	35	21
1318001287	WABASH ALLOYS	38	28	24	18	20
1318000101	PPG INDUSTRIES, INC. - CLEVELAND	19	18	18	19	18
1318007398	Allied Corp Plant 1				2	13
1318008238	AMP Ohio				16	12
1318002663	VON ROLL ISOLA -- MIDWEST MICA INSULATION COMPANY	1	1	1		11
1318001618	SIFCO FORGE GROUP, INC.	10	10	11	10	9
1318002965	METROHEALTH MEDICAL CENTER	17	11	8	8	9
1318005977	GEM				11	9

**2005
CLEVELAND, FOR
CUYAHOGA SOURCES
PERMIT FEE DATABASE**

TONS PER YEAR

VOC

Premise Number	Facility Name	2000	2001	2002	2003	2004
1318120180	FORD MOTOR COMPANY, CLEVELAND CASTING PLANT	794	655	620	604	583
1318000399	NORTH COAST CONTAINER CORP.	122	112	148	144	141
1318538151	MM CUYAHOGA ENERGY LLC	129	136	129	112	138
1318040267	THE SHERWIN-WILLIAMS CO.	222	238	155	132	135
1318001613	ISG CLEVELAND INC.	175	141	82	87	112
1318000101	PPG INDUSTRIES, INC. - CLEVELAND	84	103	94	96	93
1318202137	THE LINCOLN ELECTRIC COMPANY	39	42	26	32	80
1318007651	Chemical Solvents	52	36	55	32	73
1318587360	COMMONWEALTH ALUMINUM, BEDFORD COIL COATING FACILI	13	13	71	67	67
1318121632	WELLMAN FRICTION PRODUCTS BROOK PARK	32	13	23	46	55
1318082830	Marathon Ashland Brecksville		54	67	41	46
1318008053	AUTO-TAP, INC	66			62	45
1318532181	Smurfit Stone	38	35	38	39	45
1318226136	AUTOMATED PACKAGING SYSTEMS	88	48	62	52	42
1318120179	FORD MOTOR CO CLEVELAND ENGINE PLANT 1	15	14	11	8	38
1318544510	GLASTIC CORPORATION CLEVELAND FACILITY	47	35	34	34	36
1318170170	St. Ives	34	28	30	31	34
1318558062	Avery Dennison Strongsville				24	30
1318002698	SUNOCO PARTNERS MARKETING & TERMINALS LP	33	32	33	31	28
1318008048	THE LINDERME TUBE COMPANY	46	26	24	18	26
1318538170	CARD PAK INCORPORATED	11	37	48	38	22
1318247813	CUYAHOGA REGIONAL SANITARY LANDFILL	28	37	31	18	20
1318617346	USG INTERIORS, INC., AMERICAN METALS CORP., WESTLA	42	44	54	22	20
1318557928	Western Reserve Sleeve				16	19
1318007355	Ritrama Duramark				35	18
1318001435	Avery Label					17
1318000245	CLEVELAND ELECTRIC ILLUMINATING CO., LAKE SHORE PL	7	11	18	14	16
1318001287	WABASH ALLOYS	36	18	22	15	15
1318118369	All Foils					15
1318005897	Center Terminal				14	13
1318006552	DAY-GLO COLOR CORP.	38	21	16	10	11
1318170183	US Logistics				11	11
1318005887	Robin Industries	7	7	7	9	10
1318005949	GOODRICH LANDING GEAR-PLATING OPERATIONS	7	8	8	7	9

**2005 - CLEVELAND, FOR
CUYAHOGA SOURCES**

TONS PER YEAR

Appendix C

The following charts represent county-by-county emissions reduction data as reported by LADCO's contractor, MACTEC, for the VOC controls studied by LADCO and found in this Report:

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: AIM Coatings

Candidate Control Measure: SOLV1A - Adopt more stringent VOC limits for AIM coatings based on OTC Model Rule and Wisconsin NR433.17

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

FIPS STATE	FIPS CNTY	STATE	AB NAME	VOC Emissions (tpy)				Measur ID
				2002 Base	2009 Reduction	2009 Tons Per Day	2009 Remaining	
39	007	OH	Ashtabula	264.11	56.45	0.15	207.66	SOLV1A
39	035	OH	Cuyahoga	3,463.21	731.30	2.00	2,731.92	SOLV1A
39	055	OH	Geauga	234.83	49.72	0.14	185.10	SOLV1A
39	085	OH	Lake	582.33	123.71	0.34	458.62	SOLV1A
39	093	OH	Lorain	728.55	154.29	0.42	574.26	SOLV1A
39	103	OH	Medina	404.68	86.15	0.24	318.53	SOLV1A
39	133	OH	Portage	397.55	85.09	0.23	312.47	SOLV1A
39	153	OH	Summit	1,395.43	297.05	0.81	1,098.38	SOLV1A
				7,470.69	1,583.76	4.34	5,886.94	

The total VOC reduction if implemented statewide across Ohio would be: 17.02 tons per day

The total VOC reduction if implemented across the 5 LADCO states would be: 54.21 tons per day.

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: AIM Coatings

Candidate Control Measure: SOLV1B - Adopt SCAQMD Phase III VOC limits for AIM coatings in addition to OT Model Rule and Wisconsin NR433.17

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39		007		OH		Ashtabula	264.11	81.82	0.22	182.29	SOLV1B
39		035		OH		Cuyahoga	3463.21	1072.48	2.94	2390.73	SOLV1B
39		055		OH		Geauga	234.83	72.73	0.20	162.10	SOLV1B
39		085		OH		Lake	582.33	180.36	0.49	401.96	SOLV1B
39		093		OH		Lorain	728.55	225.63	0.62	502.92	SOLV1B
39		103		OH		Medina	404.68	125.35	0.34	279.33	SOLV1B
39		133		OH		Portage	397.55	123.16	0.34	274.39	SOLV1B
39		153		OH		Summit	1395.43	432.23	1.18	963.20	SOLV1B
							7,470.69	2,313.76	6.34	5,156.92	

The total VOC reduction if implemented statewide across Ohio would be: 24.77 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 84.69 tons per day.

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: Consumer and Commercial Products

Candidate Control Measure: SOLV2A - Adopt OTC Model Rule with additional product coverage and more stringent VOC limits

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>					
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>ABNAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
						<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	
									<u>ID</u>	
39	007		OH		Ashtabula	374.18	53.01	0.15	321.17	SOLV2A
39	035		OH		Cuyahoga	5033.53	713.14	1.95	4320.39	SOLV2A
39	055		OH		Geauga	339.38	48.08	0.13	291.29	SOLV2A
39	085		OH		Lake	835.86	118.42	0.32	717.44	SOLV2A
39	093		OH		Lorain	1052.51	149.12	0.41	903.40	SOLV2A
39	103		OH		Medina	578.30	81.93	0.22	496.37	SOLV2A
39	133		OH		Portage	561.68	79.58	0.22	482.11	SOLV2A
39	153		OH		Summit	1994.29	282.55	0.77	1711.74	SOLV2A
						10,769.73	1,525.83	4.18	9,243.91	

The total VOC reduction if implemented statewide across Ohio would be: 16.18 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 65.22 tons per day.

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: Consumer and Commercial Products

Candidate Control Measure: SOLV2B - Adopt CARB 2003 SIP requirements (CONS-1 and CONS-2) with additional products and more stringent VOC limits (in addition to OTC Model Rule)

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009 Measure</u>		
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39	007		OH			Ashtabula	374.18	93.26	0.26	280.92	SOLV2B
39	035		OH			Cuyahoga	5033.53	1254.55	3.44	3778.97	SOLV2B
39	055		OH			Geauga	339.38	84.59	0.23	254.79	SOLV2B
39	085		OH			Lake	835.86	208.33	0.57	627.53	SOLV2B
39	093		OH			Lorain	1052.51	262.33	0.72	790.19	SOLV2B
39	103		OH			Medina	578.30	144.14	0.39	434.17	SOLV2B
39	133		OH			Portage	561.68	139.99	0.38	421.69	SOLV2B
39	153		OH			Summit	1994.29	497.06	1.36	1497.23	SOLV2B
							10,769.73	2,684.25	7.35	8,085.49	

The total VOC reduction if implemented statewide across Ohio would be: 28.47 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 113.98 tons per day.

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: Auto Body Refinishing

Candidate Control Measure: SOLV4A - Extend the existing IL/IN/WI RACT regulations beyond 1-hr nonattainment counties

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39		007		OH		Ashtabula	66.63	19.04	0.05	47.60	SOLV4A
39		035		OH		Cuyahoga	896.38	256.11	0.70	640.27	SOLV4A
39		055		OH		Geauga	60.44	17.27	0.05	43.17	SOLV4A
39		085		OH		Lake	148.85	42.53	0.12	106.32	SOLV4A
39		093		OH		Lorain	187.43	53.55	0.15	133.88	SOLV4A
39		103		OH		Medina	102.99	29.42	0.08	73.56	SOLV4A
39		133		OH		Portage	100.03	28.58	0.08	71.45	SOLV4A
39		153		OH		Summit	355.15	101.47	0.28	253.68	SOLV4A
							1,917.90	547.97	1.50	1,369.93	

The total VOC reduction if implemented statewide across Ohio would be: 5.81 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 16.96 tons per day.

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: Auto Body Refinishing

Candidate Control Measure: SOLV4B - Adopt More Stringent RACT regulations based on SCAQMD 1151

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39		007		OH		Ashtabula	66.63	55.00	0.15	11.63	SOLV4B
39		035		OH		Cuyahoga	896.38	739.87	2.03	156.51	SOLV4B
39		055		OH		Geauga	60.44	49.88	0.14	10.55	SOLV4B
39		085		OH		Lake	148.85	122.86	0.34	25.99	SOLV4B
39		093		OH		Lorain	187.43	154.71	0.42	32.73	SOLV4B
39		103		OH		Medina	102.99	85.00	0.23	17.98	SOLV4B
39		133		OH		Portage	100.03	82.56	0.23	17.46	SOLV4B
39		153		OH		Summit	355.15	293.14	0.80	62.01	SOLV4B
							1,917.90	1,583.02	4.34	334.86	

The total VOC reduction if implemented statewide across Ohio would be: 16.79 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 56.56 tons per day.

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: Industrial Surface Coating (Area Sources)

Candidate Control Measure: SOLV5A - Adopt More Stringent RACT regulations, lower applicability thresholds, and extend geographic coverage

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39	007		OH			Ashtabula	69.89	50.32	0.14	19.57	SOLV5A
39	035		OH			Cuyahoga	1225.82	882.59	2.42	343.23	SOLV5A
39	055		OH			Geauga	1908.72	1374.28	3.77	534.44	SOLV5A
39	085		OH			Lake	404.20	291.02	0.80	113.18	SOLV5A
39	093		OH			Lorain	1000.99	720.71	1.97	280.28	SOLV5A
39	103		OH			Medina	392.55	282.63	0.77	109.91	SOLV5A
39	133		OH			Portage	155.20	111.74	0.31	43.46	SOLV5A
39	153		OH			Summit	643.13	463.05	1.27	180.08	SOLV5A
							5,800.50	4,176.34	11.44	1,624.15	

The total VOC reduction if implemented statewide across Ohio would be: 79.27 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 231.54 tons per day.

White Paper: Industrial Surface Coating (Point Sources)

Candidate Control Measure: SOLV5A - Adopt More Stringent RACT regulations, lower applicability thresholds, and extend geographic coverage

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measure</u>	
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39	035		OH			Cuyahoga	151.93	136.74	0.37	15.19	SOLV5A
39	093		OH			Lorain	680.02	549.25	1.50	130.77	SOLV5A
39	153		OH			Summit	222.73	26.59	0.07	196.14	SOLV5A
							1054.68	712.58	1.95	342.10	

The total VOC reduction if implemented statewide across Ohio would be: 21.96 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 160.59 tons per day.

County Level Emission Summaries

Base 2002 Inventory: LADCO Base J

White Paper: Industrial Solvent Cleaning (Area Sources)

Candidate Control Measure: SOLV6A - Adopt Chicago/Metro East Cold Cleaning Regulations in all counties

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39	007	OH				Ashtabula	26.52	17.50	0.05	9.02	SOLV6A
39	035	OH				Cuyahoga	2132.66	1407.55	3.86	725.10	SOLV6A
39	055	OH				Geauga	209.25	138.11	0.38	71.15	SOLV6A
39	085	OH				Lake	612.47	404.23	1.11	208.24	SOLV6A
39	093	OH				Lorain	379.50	250.47	0.69	129.03	SOLV6A
39	103	OH				Medina	206.54	136.32	0.37	70.22	SOLV6A
39	133	OH				Portage	587.38	387.67	1.06	199.71	SOLV6A
39	153	OH				Summit	605.74	399.79	1.10	205.95	SOLV6A
							4,760.06	3,141.64	8.61	1,618.42	

The total VOC reduction if implemented statewide across Ohio would be: 29.98 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 100.05 tons per day.

County Level Emission Summaries

**Base 2002 Inventory: NEI2002 Preliminary
White Paper: Gasoline Distribution Facilities**

Candidate Control Measure: SOLV7A - Adopt CARB EVR Stage I requirements

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>					
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
						<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	
									<u>ID</u>	
39	007		OH		Ashtabula	57.91	45.17	0.12	12.74	SOLV7A
39	035		OH		Cuyahoga	473.95	369.68	1.01	104.27	SOLV7A
39	055		OH		Geauga	42.69	33.30	0.09	9.39	SOLV7A
39	085		OH		Lake	90.70	70.75	0.19	19.95	SOLV7A
39	093		OH		Lorain	136.05	106.12	0.29	29.93	SOLV7A
39	103		OH		Medina	75.42	58.83	0.16	16.59	SOLV7A
39	133		OH		Portage	80.48	62.77	0.17	17.71	SOLV7A
39	153		OH		Summit	212.51	165.76	0.45	46.75	SOLV7A
						1,169.71	912.37	2.50	257.34	

The total VOC reduction if implemented statewide across Ohio would be: 27.81 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 90.37 tons per day.

County Level Emission Summaries

Base 2002 Inventory: NEI2002 Preliminary

White Paper: Gasoline Distribution Facilities

Candidate Control Measure: SOLV7b OTB - On-the Books measure: Use of on-board refueling vapor recovery (ORVR) canisters to capture and adsorb vapors from the vehicle fuel tank.

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

VOC Emissions (tpy)

FIPS	STATE	FIPS	CNTY	STATE	AB NAME	2002	2009	2009	Measur ID
						Base	Reduction	Tons Per Day	
39		007		OH	Ashtabula	42.94	16.51	0.05	26.43 SOLV7OTI
39		035		OH	Cuyahoga	378.02	145.39	0.40	232.63 SOLV7OTI
39		055		OH	Geauga	32.92	12.66	0.03	20.26 SOLV7OTI
39		085		OH	Lake	66.18	25.45	0.07	40.73 SOLV7OTI
39		093		OH	Lorain	107.71	41.43	0.11	66.28 SOLV7OTI
39		103		OH	Medina	61.34	23.59	0.06	37.75 SOLV7OTI
39		133		OH	Portage	66.65	25.63	0.07	41.02 SOLV7OTI
39		153		OH	Summit	176.66	67.94	0.19	108.72 SOLV7OTI
						932.42	358.61	0.98	573.81

The total VOC reduction if implemented statewide across Ohio would be: 5.01 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 63.87 tons per day.

County Level Emission Summaries

**Base 2002 Inventory: NEI2002 Preliminary
White Paper: Gasoline Distribution Facilities**

Candidate Control Measure: SOLV7B Adopt CARB EVR Stage II requirements

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>					
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>ABNAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
						<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	
									<u>ID</u>	
39		007		OH	Ashtabula	42.94	29.73	0.08	13.21	SOLV7B
39		035		OH	Cuyahoga	378.02	261.70	0.72	116.32	SOLV7B
39		055		OH	Geauga	32.92	22.79	0.06	10.13	SOLV7B
39		085		OH	Lake	66.18	45.82	0.13	20.36	SOLV7B
39		093		OH	Lorain	107.71	74.57	0.20	33.14	SOLV7B
39		103		OH	Medina	61.34	42.47	0.12	18.87	SOLV7B
39		133		OH	Portage	66.65	46.14	0.13	20.51	SOLV7B
39		153		OH	Summit	176.66	122.30	0.34	54.36	SOLV7B
						932.42	645.51	1.77	286.91	

The total VOC reduction if implemented statewide across Ohio would be: 8.78 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 111.80 tons per day.

County Level Emission Summaries

**Base 2002 Inventory: NEI2002 Preliminary
White Paper: Gasoline Distribution Facilities**

Candidate Control Measure: SOLV7C Require Air Pollution Control Device for UST Vent

Note 1: 2009 emissions include effect of control measure only; does not include growth adjustment

Note 2: In some cases, the county-level summaries do not exactly match the emission numbers from the White Papers. The reasons for these differences are discussed in *CountySums_vs_WhitePapers.doc*

					<u>VOC Emissions (tpy)</u>						
<u>FIPS</u>	<u>STATE</u>	<u>FIPS</u>	<u>CNTY</u>	<u>STATE</u>	<u>AB</u>	<u>NAME</u>	<u>2002</u>	<u>2009</u>	<u>2009</u>	<u>Measur</u>	
							<u>Base</u>	<u>Reduction</u>	<u>Tons Per Day</u>	<u>Remaining</u>	<u>ID</u>
39	007		OH			Ashtabula	40.39	29.08	0.08	11.31	SOLV7C
39	035		OH			Cuyahoga	22.87	16.47	0.05	6.40	SOLV7C
39	055		OH			Geauga	115.88	83.43	0.23	32.45	SOLV7C
39	085		OH			Lake	44.51	32.05	0.09	12.46	SOLV7C
39	093		OH			Lorain	117.53	84.62	0.23	32.91	SOLV7C
39	103		OH			Medina	37.26	26.83	0.07	10.43	SOLV7C
39	133		OH			Portage	25.14	18.10	0.05	7.04	SOLV7C
39	153		OH			Summit	7.47	5.38	0.01	2.09	SOLV7C
							411.05	295.96	0.81	115.09	

The total VOC reduction if implemented statewide across Ohio would be: 4.00 tons per day.

The total VOC reduction if implemented across the 5 LADCO states would be: 20.11 tons per day.