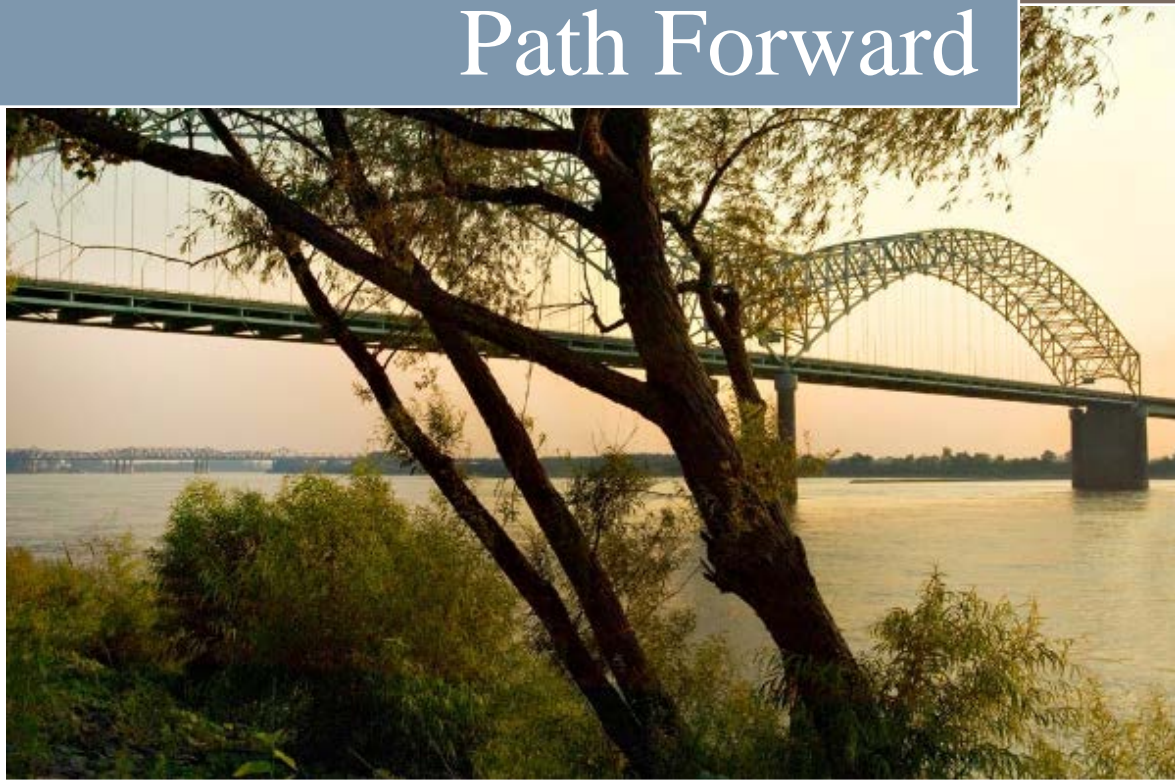


Ozone Advance

Crittenden County Path Forward



Public Review Draft

Office of Air Quality

Arkansas Department of Environmental
Quality

Table of Contents

I. Introduction..... 1

 A. Early Partner Development 2

 1. The Ozone Flex Program..... 2

 2. The Early Action Compact Program 3

 B. Ozone Human Health and Ecosystem Concerns 4

 1. Ozone Health Concerns 4

 2. Ozone Ecosystem Effects 5

 C. Air Quality in Arkansas..... 5

 D. Ozone Sources..... 6

II. Measures to Improve Air Quality 8

III. Implementation Schedule..... 9

IV. Provisions for Public/Stakeholder Involvement 9

V. Conclusion 9

Appendix A Potential Ozone Advance Path Forward Strategies.....

Appendix B Potential Funding Sources for Ozone Advance Actions and Measures

CRITTENDEN COUNTY OZONE ADVANCE PROGRAM PATH FORWARD PLAN

I. Introduction

The Ozone Advance Program is a voluntary, collaborative effort among the United States Environmental Protection Agency (EPA), states, local governments, businesses, and industry. The goal of the program is to reduce ground-level ozone and ozone precursors as a way of helping participating areas continue to meet the national ambient air quality standard (NAAQS) for ozone. This is accomplished by encouraging a proactive approach at the State and local level, with the aid of the Advance Program, to help ensure that local air quality remains healthy. The EPA provides technical assistance and other support to State and local governments administering an Ozone Advance program.

EPA establishes NAAQS for common outdoor pollutants—referred to as criteria pollutants—that can be deleterious to human health and welfare and to the environment at elevated concentrations. These pollutants are ozone, particulate matter (PM), lead, nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and carbon monoxide (CO). The NAAQS for these pollutants are established to protect human health and welfare and the environment with an adequate margin of safety. Attainment status with the NAAQS is determined based on measured concentrations from air monitors located strategically throughout the State to provide coverage of populated areas and background concentration information. Monitor data are used to calculate design values based on the level, averaging time, and form of the NAAQS. Areas with design values exceeding the NAAQS are designated as nonattainment areas and states must develop plans and implement controls to reduce emissions of pollutants so that the area can attain the NAAQS.

The air quality in Arkansas with respect to criteria pollutants, particularly ozone, has steadily improved throughout the state. As ozone NAAQS have been tightened—the standard was lowered in 1997, 2008, and 2015—certain areas of Arkansas have been at-risk of a nonattainment classification and one county, Crittenden County, was designated nonattainment for the 1997 and 2008 ozone NAAQS. Crittenden County was redesignated to attainment for 1997 ozone NAAQS in 2010 and the 2008 ozone NAAQS in 2016 and is currently a maintenance area for both standards. The design value for the eight-hour ozone NAAQS in Crittenden County has decreased to sixty-six parts per billion (ppb) as of 2015; but, the design value is within six percent of the level of the new 2015 ozone NAAQS of seventy ppb.

Based on 2013–2015 ozone design values, Governor Asa Hutchinson has recommended that all counties in Arkansas be designated as attainment or attainment/unclassifiable (for counties that do not have a monitor) for the 2015 ozone NAAQS. Although, all counties are anticipated to continue to attain the 2015 ozone NAAQS, the Arkansas Department of Environmental Quality (ADEQ or “Department”) intends to participate in the Ozone Advance program to continue improving air quality in Crittenden County as part of its effort to ensure continued attainment with the ozone NAAQS.

This proposed Path Forward plan describes past and ongoing measures and programs in Crittenden County that have helped to reduce ozone, a brief description of ozone-associated health and environmental effects, the current status of air quality issues in Crittenden County, key sources of ozone, and provisions for public and stakeholder involvement. This Path Forward Plan also provides a list of potential funding sources for programs that could be implemented under the Path Forward. ADEQ solicits comments from the public and stakeholders on programs to implement in Crittenden County in order to improve air quality with respect to ozone.

A. Early Partner Development

ADEQ has worked alongside Arkansas air quality stakeholders (as well as those in neighboring states) on voluntary programs to reduce ozone for over a decade. The Crittenden County region is anticipated to benefit from implementation of the Ozone Advance Program in Arkansas. Arkansas has participated in two other voluntary programs—Early Action Compact (EAC) and Ozone Flex—that preceded the Ozone Advance program, to aid Arkansas communities in maintaining the ozone NAAQS. The EAC helped areas work towards attainment of the 1997 eight-hour ozone NAAQS, while the Ozone Flex program helped nonattainment areas maintain the 1979 one-hour ozone NAAQS.

1. The Ozone Flex Program

The Ozone Flex Program included areas that were in attainment with the 1979 one-hour ozone NAAQS, but for which states wanted to avoid future exceedances or violations of the standard. The state or local air quality agencies participating in the program were required to submit a letter of commitment to EPA detailing local stakeholder interest. Stakeholders could include regulated sources, operators of large transportation fleets, key individuals/departments from State or local agencies, key political leaders, representatives of the local business community, and environmental and/or public advocacy groups. State and local agencies and EPA then entered into an official Memorandum of Agreement (MOA) outlining the area boundaries, information regarding emissions and conditions that would affect ozone levels, an action plan with supporting data as to the effectiveness of the plan, a timeline summarizing milestones, and a process to review program effectiveness and provide feedback.

In March of 2003, Metroplan, ADEQ, Arkansas Highway and Transportation Department, and the EPA Region Six entered into a MOA known as the Central Arkansas Ozone Flex Plan. The MOA pertained to the Arkansas counties of Pulaski, Faulkner, Saline, and Lonoke and was designed to address potential nonattainment of the 1979 one-hour and the 1997 eight-hour ozone NAAQS. The plan was to remain in effect for five years from March 2003; however, the EPA revoked the federal one-hour standard on April 15, 2005—except for in eight-hour ozone standard nonattainment areas—effectively ending the need for the Ozone Flex Program for the one-hour ozone NAAQS and Arkansas requested early termination of the MOA.

2. The Early Action Compact Program

The EAC program was an agreement between communities and the EPA to help communities reach attainment of the 1997 eight-hour ozone standard. On April 15, 2004, EPA made attainment status designations for the 1997 eight-hour ozone standard. For areas that were violating the standard, but had an approved EAC, the EPA deferred the effective date of the nonattainment designation for as long as the area continued to meet compact milestones. The goal was for these areas to reach attainment by December 2004 instead of 2007, which was the deadline for areas designated as nonattainment to meet the standard. As long as these communities were actively enrolled in the EAC program (and the deadline for meeting the eight-hour ozone standard was deferred) certain requirements for nonattainment areas under the Clean Air Act, such as controls on new sources, would not apply. The EAC required that participating areas would gain attainment by no later than December 31, 2007 and would remain in attainment until December 31, 2012.

The EPA entered into an EAC for the Memphis TN-AR-MS area on December 30, 2002. The Memphis EAC area successfully completed the December 31, 2002, and June 16, 2003, milestone requirements, and subsequently submitted the June and December 2003 progress reports. By March 31, 2004 the EAC areas were required to submit a local plan that detailed the specific implementation dates for local control and a technical assessment of whether the area could attain the 1997 eight-hour ozone NAAQS, by the December 31, 2007, milestone. On April 15, 2004, EPA determined that the Memphis EAC area did not meet the requirements for deferred designation under the EAC program. EPA asserted that the Tennessee and Arkansas Memphis EAC areas did not pass the modeled attainment test and the predicted air quality improvement test. However, the DeSoto County, Mississippi EAC area was found not to impact downwind sites resulting in an attainment designation and revocation of Mississippi's participation in the EAC. EPA indicated that the review of meteorological influences for the TN-AR areas was inconclusive as to whether proposed reductions in emissions would lead to attainment for the 1997 eight-hour ozone NAAQS by the attainment deadline. In addition to the technical analyses, EPA criticized the strength of the control strategies proposed by the Memphis EAC area. Thus, EPA declined to defer the effective date of the nonattainment designations of the Memphis area. The Shelby County, TN and Crittenden County, AR portions of the Memphis metropolitan statistical area (MSA) were designated as nonattainment for the 1997 ozone 8-hour standard under Title 1, Part D, Subpart 2 of the Clean Air Act, effective June 15, 2004. DeSoto County, Mississippi was not included in the nonattainment area. Crittenden County was redesignated to attainment of the 1997 eight-hour ozone NAAQS on March 24, 2010 (73 Federal Register 16547).

B. Ozone Human Health and Ecosystem Concerns

The EPA is mandated in accordance with § 108 of the Clean Air Act to review the NAAQS and to make revisions when necessary. The 8-hour ozone NAAQS was lowered to seventy-five ppb in 2008 (73 FR 16436) and again in 2015 to seventy ppb (80 FR 65291). Below the health and environmental concerns that led to EPA lowering the ozone NAAQS are examined.

1. Ozone Health Concerns

Ozone can negatively affect human health by interfering with respiratory and cardiovascular systems—especially respiratory system functions. Ozone can cause the muscles in the airways to constrict, trapping air in the alveoli leading to wheezing and shortness of breath. Researchers found that long-term exposure to ozone was associated with higher levels of death from cardiovascular disease, strokes, and respiratory causes.¹ The primary NAAQS are to be set to protect public health including the health of sensitive populations such as asthmatics, children, and the elderly who may respond more negatively to increased ozone levels. However, the NAAQS are meant to reduce risk not alleviate it completely.

Ozone can:

- Make it more difficult to breathe deeply and vigorously;
- Cause shortness of breath, and pain when taking a deep breath;
- Cause coughing and sore or scratchy throat;
- Inflammate and damage the airways;
- Aggravate lung diseases such as asthma, emphysema, and chronic bronchitis;
- Increase the frequency of asthma attacks;
- Make the lungs more susceptible to infection;
- Continue to damage the lungs even when the symptoms have disappeared; and
- Cause chronic obstructive pulmonary disease (COPD).

These respiratory system function impairments have been found in healthy people after exposure to ozone; however, the effects of exposure can be more serious in people with pre-existing lung diseases, such as asthma. Ozone-associated respiratory function impairments may lead to increased school absences, medication use, visits to doctors and emergency rooms, and hospital admissions.²

Short-term inhalation of ozone has also been linked to cardiovascular effects. A recent study linked exposures to high ozone levels for as little as one hour to a type of cardiac arrhythmia that

¹ Zanobetti, A., Schwartz, J. Mortality displacement in the association of ozone mortality: an analysis of 48 cities in the United States. *American Journal of Respiratory and Critical Care Medicine* (Am J Respir Crit Care Med.) 2008; 177:184-189. Source: <http://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/ozone.html>.

² Source: <https://www.epa.gov/ozone-pollution/health-effects-ozone-pollution>

itself increases the risk of premature death and stroke.³ A French study found that exposure to elevated ozone levels for only one to two days increased the risk of heart attacks for middle-aged adults without heart disease.⁴ Additionally, other studies have found increased risk of hospital admissions or emergency department visits for cardiovascular disease linked to ozone pollution.⁵

2. Ozone Ecosystem Effects

Ozone can affect ecosystems at many levels including individual plants, species, forests, and globally.⁶ Physiological effects on individual plants include reduced photosynthesis, increased turnover of antioxidants, damage to reproductive processes, increased dark respiration, and lowered carbon transport to roots lowering root growth. Impacts on vegetation may include many forest tree species and agricultural crops, including many forest tree species common in Arkansas. Any impacts on forest and agricultural crops would impact the economics of these industries in the state. Decreases in forest tree growth and stomatal damage due to ozone pollution can impact fundamentally important ecosystem services including carbon uptake and primary productivity, nutrient cycling, and stomatal functioning and water cycling.⁷

Many crops species—including wheat, rice, soybeans, and other legumes—important to human diets and health have shown large declines in yield after exposure to elevated ozone concentrations.⁸ Sunlight, humidity, temperature, and soil moisture are key factors that influence plant reactions to ozone.⁹

C. Air Quality in Arkansas

With the redesignation of Crittenden County to attainment for the 2008 Ozone NAAQS, all of Arkansas is in compliance with all NAAQS, including the 2015 ozone NAAQS. Recent ozone

³ Rich, DQ, Mittleman MA, Link MS, Schwartz J, Luttmann-Gibson H, Catalano PJ, Speizer FE, Gold DR, Dockery DW. Increased Risk of Paroxysmal Atrial Fibrillation Episodes Associated with Acute Increases in Ambient Air Pollution. *Environ Health Perspect.* 2006; 114:120-123.

⁴ Ruidavets J-B, Cournot M, Cassadou S, Giroux M, Maybeck M, Ferrières J. Ozone Pollution is Associated with Acute Myocardial Infarction. *Circulation.* 2005; 111:563-569.

⁵ Azevedo JM, Gonçalves FL, de Fátima Andrade M. Long-range ozone transport and its impact on respiratory and cardiovascular health in the north of Portugal. *Int J Biometeorol.* 2011; 55: 187-202;

Linares C, Diaz J. Short-term effect of concentrations of fine particulate matter on hospital admissions due to cardiovascular and respiratory causes among the over-75 age group in Madrid, Spain. *Public Health.* 2010; 124: 28-36;

Middleton N, Yiallourous P, Kleanthous S, Kolokotroni O, Schwartz J, et al. A 10-year time-series analysis of respiratory and cardiovascular morbidity in Nicosia, Cyprus: The effect of short-term changes in air pollution and dust storms. *Environ Health.* 2008; 7: 39;

Lee JT, Kim H, Cho YS, Hong YC, Ha EH, Park H. Air pollution and hospital admissions for ischemic heart diseases among individuals 64+ years of age residing in Seoul, Korea. *Arch Environ Health.* 2003; 58: 617-623;

Wong TW, Lau TS, Yu TS, Neller A, Wong SL, Tam W, Pang SW. Air pollution and hospital admissions for respiratory and cardiovascular diseases in Hong Kong. *Occup Environ Med.* 1999; 56: 679-683.

⁶ Source: http://icpvegetation.ceh.ac.uk/publications/documents/CEH_BIODIVERSITY_SINGLES_HIGH.pdf

⁷ Source: http://icpvegetation.ceh.ac.uk/publications/documents/CEH_EVIDENCE_SINGLES_HIGH.pdf

⁸ Id.

⁹ Mills et al. *Atmospheric Environment* 45:5064-5068

design values for Crittenden County show that the 2013–2015 design value in the area is within six percent of the 2015 ozone NAAQS and further development or shifts in seasonal temperature could put the area at risk of nonattainment of the 2015 eight-hour ozone NAAQS.

Crittenden County, a part of the Memphis TN-MS-AR MSA, reached nonattainment levels with a marginal classification for the 2008 Ozone NAAQS for the 2007–2009 ozone seasons. However the Memphis MSA reached attainment in 2014 based on the 2012–2014 design value and Arkansas requested in October 2015 that the EPA simultaneously process and review both a redesignation request and the adequacy of the maintenance plan submitted for Crittenden County. Crittenden County was redesignated to attainment as a maintenance area on May 25, 2016. Crittenden County is expected to maintain attainment under the 2015 Ozone NAAQS, which lowers the standard to seventy ppb from seventy-five ppb, as the level for the county was sixty-six ppb in 2015. New initiatives included in this Path Forward plan should aid the county in maintaining attainment.

D. Ozone Sources

Ozone is formed in the atmosphere by the reaction of volatile organic compounds (VOCs) and nitrogen oxides (NO_x) in the presence of sunlight. In many states, such as Arkansas, the ozone levels tend to be higher in the summer months, thus the ozone NAAQS monitoring season extends from March to November. VOCs and NO_x are often referred to as ozone precursors and are emitted by many anthropogenic and biogenic sources.

The Department and EPA keep an inventory of emissions of NO_x and VOCs emitted from larger stationary sources and the EPA inventories emissions from other emission source categories. The major categories of emission sources are point, area, non-road mobile, on-road mobile, and event. Point sources are large, stationary emissions sources that include many industrial sources, such as electricity generating units, factories, refineries, chemical plants, bulk terminals, and utilities. Area sources can be small-scale industrial, commercial, and residential sources that generate emissions but are individually too small to qualify as point sources. Off-road mobile sources include agricultural machinery (e.g., tractors and combines), construction equipment (e.g., graders and backhoes), industrial and commercial equipment (e.g., fork lifts and street sweepers), residential and commercial lawn and garden equipment, and recreational vehicles (e.g., four-wheelers and off-road motorbikes). On-road mobile sources include passenger cars, passenger trucks, motorcycles, buses, heavy-duty trucks, and other motor vehicles on public roadways. The event source category captures emissions from wildfires, prescribed burns, and wild land fires.

Figure 1 shows trends in NO_x emissions in Crittenden County by source category. The primary contributor to NO_x emissions in Crittenden County is the on-road mobile category. Figure 2 shows trends in VOC emissions in Crittenden County by source category. The primary

contributor to VOC emissions in Crittenden County is biogenics, which are included in the nonpoint source category. Because emissions from biogenic sources, which cannot be controlled, comprise approximately ninety percent of VOC emissions in the State, measures to reduce ozone should focus on reducing emissions of NOx.

Figure 1 Crittenden County NOx Emissions by Category

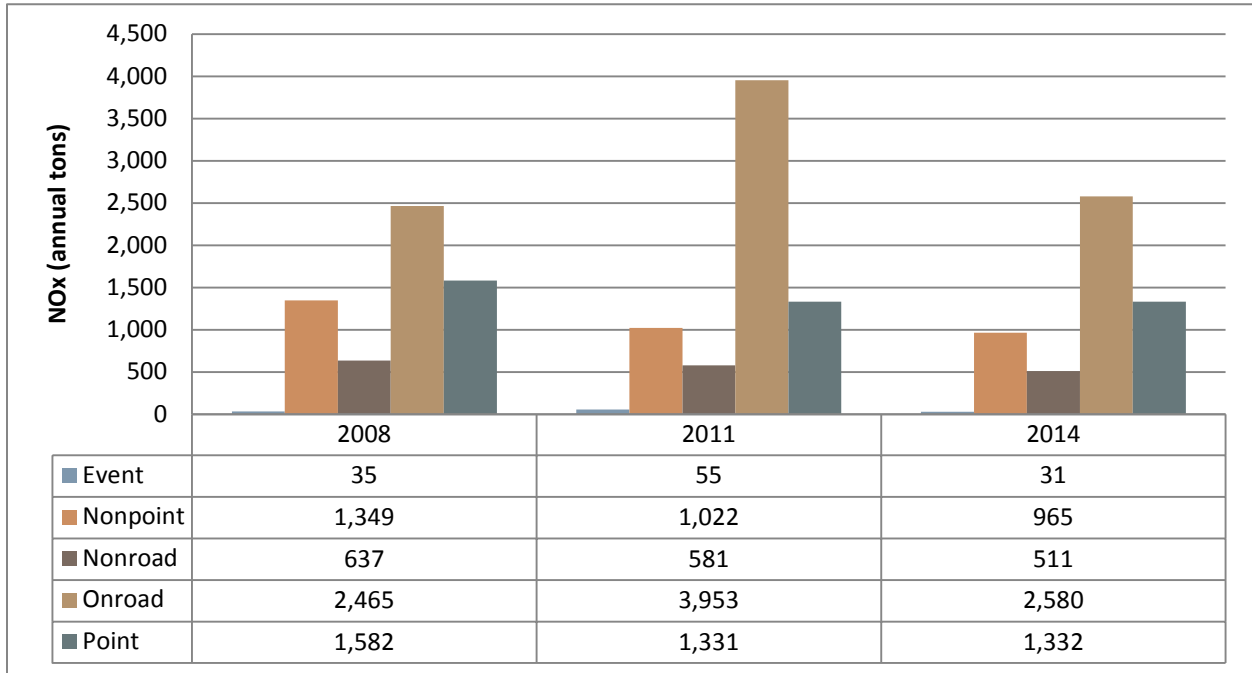
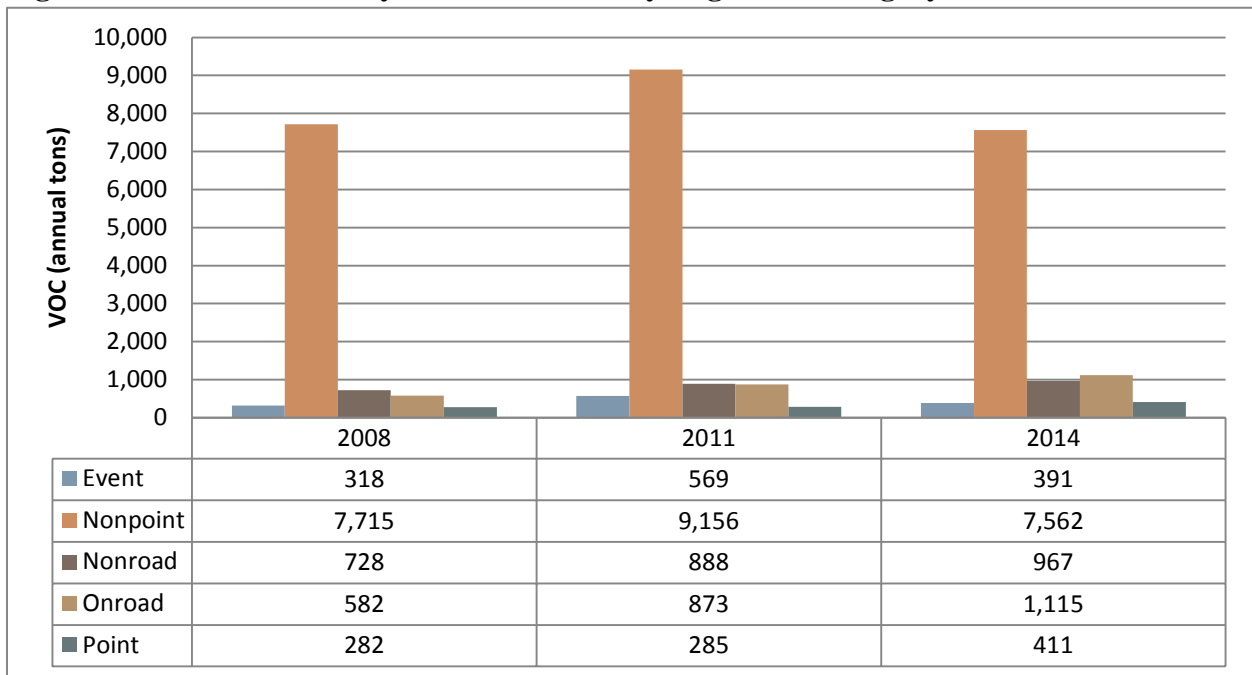


Figure 2 Crittenden County VOC Emissions by Regulated Category



II. Measures to Improve Air Quality

Arkansas currently implements programs to reduce emissions of ozone precursors in Crittenden County and across the State.

The Go RED! is a program developed by ADEQ with awarded funding from the EPA's State Clean Diesel Grant Program (part of EPA's Diesel Emission Reduction Program [DERA]). Emission reductions of NO_x, SO_x, PM, carbon monoxide (CO), and VOC are achieved through the Go RED! Program by installing exhaust control devices, engine upgrades, idling reduction technologies, engine replacements, vehicle equipment, and/or equipment replacement.

Air quality in Arkansas and across the nation has also been aided by new EPA requirements and funding regarding many polluting sectors including:

- Tier Three Motor Vehicle Emissions and Fuel Standards (79 FR 23414, April 28, 2014)
- Mercury and Air Toxic Standards (MATS) (77 FR 9304, February 16, 2012)
- Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (Final Rule) (U.S. EPA, 2015a)
- 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards (U.S. EPA, 2012)
- Cross State Air Pollution Rule (U.S. EPA, 2011)
- Cross State Air Pollution Rule Update (U.S. EPA, 2016)
- Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles (U.S. EPA, 2011b)
- Reciprocating Internal Combustion Engines (RICE) NESHAPs (U.S. EPA, 2010a)
- Regulation of Fuels and Fuel Additives: Modifications to Renewable Fuel Standard Program (RFS2) (U.S. EPA, 2010b)
- Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule for Model-Year 2012–2016 (U.S. EPA, 2010c)
- Hospital/Medical/Infectious Waste Incinerators: New Source Performance Standards and Emission Guidelines: Final Rule Amendments (U.S. EPA, 2009)
- Emissions Standards for Locomotives and Marine Compression-Ignition Engines (U.S. EPA, 2008a)
- Control of Emissions for Nonroad Spark Ignition Engines and Equipment (U.S. EPA, 2008b)
- NO_x Emission Standard for New Commercial Aircraft Engines (U.S. EPA, 2005)
- Regional Haze Regulations and Guidelines for Best Available Retrofit Technology Determinations (U.S. EPA, 2005a)

Arkansas also will have access to funds to reduce emissions of NO_x, an ozone-precursor, in the State through two programs: The ADEQ Go RED! Program (should Congress continue to fund DERA) and programs established under the Volkswagen Environmental Mitigation Trust.¹⁰

III. Implementation Schedule

ADEQ solicits comment on what projects should be implemented in Crittenden County as part of the Ozone Advance Path Forward plan. A list of possible strategies for implementing emission reduction projects in Crittenden County under the Ozone Advance program is included in Appendix A; however, ADEQ is also interested in suggestions for other emission reduction projects. A list of potential funding sources that could be used to develop and implement projects as part of Crittenden County's Ozone Advance Path Forward plan is included in Appendix B.

IV. Provisions for Public/Stakeholder Involvement

It is important to identify, contact, and secure the participation of key stakeholders to achieve the goals of the Ozone Advance Program. Local air quality committees will consist of representatives from local government, industry, environmental and citizens groups, and other interested parties. As the program develops, other stakeholders may need to be added as emission sources and control measures are identified, added, or altered. ADEQ has established a webpage for persons interested in the Ozone Advance program in Crittenden County. Stakeholders can also sign up for email updates via the webpage.

V. Conclusion

Participation in the Ozone Advance Program is anticipated to provide Arkansas with opportunities to further efforts for improving air quality in Crittenden, Pulaski and other counties in the state. The Ozone Advance Program will provide some flexibility in developing regional, state, or local specific programs and strategies for achieving and maintaining attainment for an area thereby avoiding regulatory impacts associated with a nonattainment designation. Additionally, technical support from EPA on developing plans for improvement of air quality in the state would also be beneficial. ADEQ will take advantage of current programs and new grant opportunities to implement measures in Crittenden County to improve air quality.

¹⁰ Arkansas is poised to receive \$14,647,709.09 to mitigate NO_x emissions in Arkansas. (Case 3:15-md-02672-CRB [JSC])

Appendix A Potential Ozone Advance Path Forward Strategies

The tables included in this Appendix list various strategies for achieving emission reductions under the Crittenden County Ozone Advance Path Forward plan. This list is not comprehensive and Arkansas already engages in some of the listed strategies. Table A-1 contains a list of general strategies. Table A-2 contains a list of strategies for State, county, and local governments, as well as school districts. Table A-3 contains a list of strategies for electric utilities and Table A-4 contains a list of programs targeting other industrial facilities.

Table A-1 General Strategies

Category	Strategy
Institutional Policies	Make a commitment to energy efficient buildings for all new construction and renovations
	Facilitate carpools/vanpools
	Provide a bus pass program for employees
	Provide compressed work schedules and teleworking
	Provide direct deposit and online government services (trip reduction)
	Curtail vehicle use, landscaping activities, and/or vehicle refueling during high ozone events
	Use of low-emission equipment/alternative fuel vehicles (AFV) in construction, landscaping, and sanitation contracts
	Provide cafeteria services to employees to discourage driving to lunch
Infrastructure Development—Green Buildings	Pursue LEED/Green Globe certification
	Make LED lighting upgrades
	Install timers and motion sensors on lighting
	Install energy-efficient windows
	Replace/upgrade HVAC systems to more energy efficient systems
	Install renewable energy systems (wind/solar/geothermal)
	Replace computers and/or office equipment with more energy efficient versions
Infrastructure Development—Fleet Management	Obtain alternative fuel vehicles replacements/retrofits
	Install alternative fuel vehicle fueling stations
	Install anti-idling technology and enact voluntary idling reduction policies
	Institute voluntary vapor recovery
	Institute voluntary emissions testing
Infrastructure Development—Miscellaneous Infrastructure	Replace powered equipment with more energy efficient or Energy Star-rated units
	Use low-VOC asphalt and road-striping
	Provide shaded parking to reduce engine load and evaporative VOC emissions on hot days
Leveraging of Services from Existing Emissions Reduction Programs	A list of existing emissions reduction programs is included in Appendix B

Table A-2 Government-Specific Strategies (State/County/Local/Schools)

Category	Strategy
Laws/Regulations/Codes	Enforce open burning prohibitions
	Provide tax credits for purchasing alternative fuel vehicles
	Adopt electrical codes and building codes that promote energy efficiency
	Provide free downtown parking for alternative fuel vehicles)
Improvements to Emissions Data Collection	Upgrade air monitors/install additional air monitors
	Require additional reporting requirements by permitted sources
	Update emissions inventories
	Update air modeling
Public Outreach/Education	Develop public awareness/information portals
	Provide ozone alerts/public service announcements
	Provide electricity and water conservation education
	Provide grants and zero- or low-interest loans for purchasing solar photovoltaics, weatherization, and alternative fuel vehicles, etc.
	Develop lawn mower exchange program
	Promote energy reduction with recognition awards programs
	Develop/provide AFV technician training
	Recommend use of air curtain incinerators to replace open burning of wood waste
	Encourage use of vapor recovery technology at gas stations
Infrastructure Development—Energy Efficiency	Replace and/or retrofit vehicles with alternative fuel vehicle technology (school buses/sanitation trucks/fleet/heavy equipment)
	Install LED street lights
Infrastructure Development—Alternative Fuel Vehicle Refueling Stations	Establish distribution goals
	Install highway exit signage to promote availability
	Install electric vehicle charging stations
Infrastructure Development—Traffic Management	Conduct traffic flow studies
	Design and develop highway improvements/lane widening
	Design and develop construction/routing bypasses
	Design and develop turn lanes/intersection improvements

	Install signal light synchronization technology
	Provide faster incident management/alternate route alerts
Infrastructure Development—Public Transit	Replace and/or retrofit vehicles with alternative fuel vehicle technology
	Provide free ride days or lower fares during ozone season
	Provide rapid transit routes (fewer stops on most utilized routes)
	Provide bus availability for special events
	Enhance bicycle and pedestrian corridors and infrastructure
	Provide bike sharing services

Table A-4 Electric Utility-Specific Strategies

Category	Strategy
Consumer outreach/incentives	Provide rebates on energy efficient appliances/air conditioners/weatherization
	Provide variable pricing during ozone season (peak vs. non-peak) subject to Arkansas Public Service Commission approval
	Provide free air conditioner tune-ups, duct inspections and repairs
	Provide weatherization assistance/education

Table A-5 Other Industry-Specific Strategies that could be Implemented on a Voluntary Basis

Category	Strategy
Cement Industry	Install SNCR (selective non-catalytic reduction) on emission sources
	Use feeds that require less energy to process
Water/Wastewater Systems	Install in-conduit hydropower generation
	Install methane capture on digesters
Chemical Plants	Install HRVOC (highly reactive VOC) fugitive emission monitoring
	Install SCR (selective catalytic reduction) on emission sources
Oil and Gas Industry	Use bottom-filling/submerged-filling to load tank trucks with petroleum products
	Retrofit tanks with VOC capture and control systems
	Install fugitive emission monitors
	Increase frequency of tank inspections
Natural Gas Industry	Install catalytic converters on compressor engines that run twenty-four hours per day

Appendix B Potential Funding Sources for Ozone Advance Actions and Measures

The tables included in this Appendix list various programs that could be used to provide funding for emission reduction actions and measures under the Crittenden County Ozone Advance Path Forward plan. This list is not comprehensive and other programs could also be used to implement actions and measures in Crittenden County. Some of the programs listed are already implemented to some extent in the State. Table B-1 contains a list of programs targeting government agencies. Table B-2 contains a list of programs targeting learning institutions. Table B-3 contains a list of programs targeting transit authorities. Table B-4 contains a list of programs targeting commercial and industrial facilities. Table B-5 contains a list of programs targeting residential property owners. Table B-6 contains a list of programs targeting nonprofit organizations.

Table B-1 Government Agencies

Entity	Emission Reduction Project	Description	Status
Arkansas Department of Environmental Quality	Go RED!	Provides public/private funding for diesel emission reduction projects including vehicle replacement	Applications are accepted December–April until available funds are depleted
Arkansas Energy Office	Arkansas Energy Performance Contracting	Provides financing for efficiency upgrades such as lighting, chillers, boilers, water systems, and renewable generation over time	Ongoing
	Clean Cities	Provides information resources regarding energy security, energy independence and environmental quality in Arkansas	Ongoing
Entergy Arkansas	City Smart Program	Provides support and incentives to institutional and public/private entities	Ongoing
	Lighting and Appliances Program	Provides discounts for on-line purchases of LED lighting and Energy Star appliances	Ongoing
Federal Highway Administration (U.S. DOT)	Accelerated Innovation Deployment Demonstration	Provides grants to state departments for innovation in highway transportation projects including adaptive signal control technology	Applications are now being accepted each year for project ready to start within 12 months
U.S. Department of Energy	Property Assessed Clean Energy (PACE) Program	Provides funds that allow state and local governments to provide financing to commercial and residential property owners for installation of energy efficiency and solar energy technology on private property	Ongoing
	Solsmart Technical Assistance	Provides technical assistance to help local governments reduce barriers to solar energy growth	Ongoing
U.S. Department of Transportation	Act FAST	Provides grants to state and local governments for highway improvements including congestion mitigation projects	Solicitation for applications are expected in Spring 2017

	Congestion Mitigation and Air Quality (CMAQ) Improvement Program	Provides funding to state highway agencies for a variety of transportation-related environmental projects	Funding is apportioned primarily to states with nonattainment areas but all other states receive a “minimum apportionment”
U.S. Environmental Protection Agency	Building Blocks for Sustainable Communities	Provides grants for assisting communities with achieving sustainability goals	Requests for proposals are announced when funding is available (none at this time)
	Environmental Education Grant	Provides funding to state/local agencies and colleges/universities for environmental education funding	Requests for proposals are announced when funding is available (none at this time)

Table B-2 Learning Institutions

Entity	Emission Reduction Project	Description	Status
Arkansas Department of Environmental Quality	Go RED!	Provides public/private funding for diesel emission reduction projects including vehicle replacement	Applications are accepted December–April until available funds are depleted
Arkansas Energy Office	Arkansas Energy Performance Contracting	Provides financing for efficiency upgrades such as lighting, chillers, boilers, water systems, and renewable generation over time	Ongoing
	Energy Efficiency Arkansas	Provides incentives and information resources from participating utility companies	Ongoing
Arkansas State Highway and Transportation Department	Transportation Alternatives Program	Provides grants for assisting local governments, school districts, and transportation authorities with a variety of alternative transportation projects	Ongoing
Entergy Arkansas	City Smart Program	Provides support and incentives to institutional and public/private entities	Ongoing
	Lighting and Appliances Program	Provides discounts for on-line purchases of LED lighting and Energy Star appliances	Ongoing
U.S. Environmental Protection Agency	Environmental Education Grant	Provides funding to state/local agencies and colleges/universities for environmental education funding	Requests for proposals are announced when funding is available (none at this time)

Table B-3 Transit Authorities

Entity	Emission Reduction Project	Description	Status
Arkansas Department of Environmental Quality	Go RED!	Provides public/private funding for diesel emission reduction projects including vehicle replacement	Applications are accepted December–April until available funds are depleted
Arkansas Energy Office	Clean Cities	Provides information resources regarding energy security, energy independence and environmental quality in Arkansas	Ongoing
Arkansas State Highway and Transportation Department	Transportation Alternatives Program	Provides grants for assisting local governments, school districts, and transportation authorities with a variety of alternative transportation projects	2017 Application period is now closed
Federal Highway Administration (U.S. DOT)	Accelerated Innovation Deployment Demonstration	Provides grants to state departments for innovation in highway transportation projects including adaptive signal control technology	Applications are now being accepted
U.S. Department of Transportation	Act FAST	Provides grants to state and local governments for highway improvements including congestion mitigation projects	Solicitation for applications are expected in Spring 2017
	Congestion Mitigation and Air Quality (CMAQ) Improvement Program	Provides funding to state highway agencies for a variety of transportation-related environmental projects	Funding is apportioned primarily to states with nonattainment areas but all other states receive a “minimum apportionment”

Table B-4 Commercial/Industrial Facilities

Entity	Emission Reduction Project	Description	Status
Arkansas Department of Environmental Quality	Environmental Assistance Small Business Loan	Provides small business loans for pollution control, pollution prevention, and waste reduction projects	Ongoing
	Go RED!	Provides public/private funding for diesel emission reduction projects including vehicle replacement	Applications are accepted December–April until available funds are depleted
Arkansas Energy Office	Energy Efficiency Arkansas	Provides incentives and information resources from participating utility companies	Ongoing
CenterPoint Energy	Commercial and Industrial Solution Program	Provides commercial customers with rebates and no-cost natural gas and water saving measures	Ongoing
	Efficiency Rebates	Provides customers with rebates for installation of energy-efficient systems and components	Ongoing
Entergy Arkansas	Agricultural Energy Solutions	Provides rebates and technical assistance to agricultural businesses	Ongoing
	Agricultural Irrigation Load Control Program	Provides agricultural customers with annual cash rewards upon installation of remote control hardware that controls well pump usage during peak demand	Ongoing
	Commercial Midstream Program	Provides commercial customers with discounted energy-efficient lighting and lighting fixtures	Ongoing
	Cool Saver Residential and Commercial AC Tune-Up Program	Provides discounts on air conditioner and heat pump tune-ups	Ongoing

	Large Commercial and Industrial Demand Response Program	Provides commercial customers with annual rewards upon installation of remote control hardware that controls energy use during peak demand	Ongoing
	Large Commercial and Industrial Program	Provides support and incentives to large businesses	Ongoing
	Lighting and Appliances Program	Provides discounts for on-line purchases of LED lighting and Energy Star appliances	Ongoing
	Small Business Energy Solutions Program	Provides financial incentives for energy-efficient projects	Ongoing

Table B-5 Residential Property Owners

Entity	Emission Reduction Project	Description	Status
Arkansas Energy Office	Energy Efficiency Arkansas	Provides incentives and information resources from participating utility companies	Ongoing
	Residential Energy Efficiency Loan Loss Reserve Program	Provides funds to participating utility companies that are used for residential customer on-bill repayment or on-bill financing programs for energy efficiency improvements such as insulation, duct sealing and HVAC replacement	Ongoing
	Weatherization Assistance Program	Provides low-income households with energy audits followed by complete weatherization	Ongoing
CenterPoint Energy	Efficiency Rebates	Provides customers with rebates for installation of energy-efficient systems and components	Ongoing
Entergy Arkansas	Cool Saver Residential and Commercial AC Tune-Up Program	Provides discounts on air conditioner and heat pump tune-ups	Ongoing
	Entergy Solutions Online Program	Provides customers that use less energy with reward points that are redeemable at participating stores	Ongoing
	Home Energy Solutions Program	Provides customers with a home energy assessment, air sealing, ceiling insulation, and installation of energy-saving devices at no cost	Ongoing
	Lighting and Appliances Program	Provides discounts for on-line purchases of LED lighting and Energy Star appliances	Ongoing
	Multifamily Program	Provides no-cost energy saving products to multifamily properties	Ongoing
	Summer Advantage Program	Provides residential customers with annual cash rewards upon installation of remote control hardware that controls air conditioning units during peak demand	Ongoing
U.S. Internal Revenue Service	Federal Tax Credits	Provides federal income tax credits for residential energy property expenditures and plug-in electric drive vehicles	Ongoing

Table B-6 Non-Profit Organizations

Entity	Emission Reduction Project	Description	Status
Arkansas Department of Environmental Quality	Go RED!	Provides public/private funding for diesel emission reduction projects including vehicle replacement	Applications are accepted December–April until available funds are depleted
U.S. Environmental Protection Agency	Building Blocks for Sustainable Communities	Provides grants for assisting communities with achieving sustainability goals	Requests for proposals are announced when funding is available (none at this time)
	Environmental Education Grant	Provides funding to state/local agencies and colleges/universities for environmental education funding	Requests for proposals are announced when funding is available (none at this time)
	Environmental Justice Small Grants Program	Provides grants to incorporated non-profit organizations for environmental justice issues including home weatherization and energy conservation education	Application deadline for FY2017 grants was February 10, 2017

For additional information regarding the programs described in this Appendix, please refer to the following web sites:

- Arkansas Department of Environmental Quality
 - Environmental Assistance Small Business Loan (<https://www.adeq.state.ar.us/poa/businessasst/loans.aspx>)
 - Go RED! (<https://www.adeq.state.ar.us/air/planning/gored/>)
- Arkansas Energy Office
 - Arkansas Energy Performance Contracting (<http://www.arkansasenergy.org/incentives-programs/arkansas-energy-performance-contracting>)
 - Clean Cities (<http://www.arkansasenergy.org/arkansas-clean-cities>)
 - Energy Efficiency Arkansas (<http://www.energyefficiencyarkansas.org/>)
 - Residential Energy Efficiency Loan Loss Reserve Program (<http://www.arkansasenergy.org/incentives-programs/residential-energy-efficiency-loan-loss-reserve-program>)
 - Weatherization Assistance Program (<http://www.arkansasenergy.org/weatherization-assistance-program-wap>)
- Arkansas State Highway and Transportation Department
 - Transportation Alternatives Program (<http://www.arkansashighways.com/tap/tap.aspx>)
- CenterPoint Energy
 - Commercial and Industrial Solutions Program (<http://www.centerpointenergy.com/en-us/business/save-energy-money/efficiency-programs-rebates/commercial-industrial-solutions-program?sa=ar>)
 - Efficiency Rebates

- Boiler system and components—for industrial customers (<http://www.centerpointenergy.com/en-us/Documents/2016CIPDocs/150295-AR-Boiler-Fact-Sheet.pdf>)
- Heating system and water heaters—for residential customers (http://www.centerpointenergy.com/en-us/Documents/2016CIPDocs/142007_AR%20combined%20fact%20sheet.pdf)
- Foodservice equipment—for schools and commercial customers (<http://www.centerpointenergy.com/en-us/Documents/2016CIPDocs/150196-AR-Foodservice-Fact-Sheet.pdf>)

- Entergy Arkansas

- Agriculture Energy Solutions (http://www.energy-arkansas.com/your_business/save_money/EE/agricultural.aspx)
- Agricultural Irrigation Load Control Program (http://www.energy-arkansas.com/your_business/save_money/EE/agricultural-irrigation.aspx)
- City Smart Program (http://www.energy-arkansas.com/your_business/save_money/EE/citysmart.aspx)
- Commercial Midstream Program (http://www.energy-arkansas.com/your_business/save_money/EE/commercial-midstream.aspx)
- Cool Saver Residential and Commercial AC Tune-Up Program (http://www.energy-arkansas.com/your_home/save_money/EE/cool-saver.aspx)
- Entergy Solutions Online Program (<https://www.energysolutionsrewards.com/>)
- Home Energy Solutions Program (http://www.energy-arkansas.com/your_home/save_money/EE/home-energy-solutions.aspx)
- Large Commercial and Industrial Demand Response Program (http://www.energy-arkansas.com/your_business/save_money/EE/commercial-demand.aspx)
- Large Commercial and Industrial Program (http://www.energy-arkansas.com/your_business/save_money/EE/commercial.aspx)

- Lighting and Appliances Program (http://www.energy-arkansas.com/your_home/save_money/EE/residential-lighting.aspx)
- Multifamily Program (http://www.energy-arkansas.com/your_home/save_money/EE/multifamily.aspx)
- Small Business Energy Solutions Program (http://www.energy-arkansas.com/your_business/save_money/EE/small-business.aspx)
- Summer Advantage Program (http://www.energy-arkansas.com/your_home/save_money/EE/summer-advantage.aspx)
- Federal Highway Administration (USDOT)—Accelerated Innovation Deployment (AID) Demonstration (<https://www.fhwa.dot.gov/innovation/grants/>)
- Federal Tax Credits
 - Residential Property Tax Credit (<https://www.irs.gov/uac/energy-incentives-for-individuals-residential-property-updated-questions-and-answers>)
 - Plug-in Electric Drive Vehicle Tax Credit <https://www.irs.gov/businesses/plug-in-electric-vehicle-credit-irc-30-and-irc-30d>)
 - Additional tax credits listed on Energy Star web site (https://www.energystar.gov/about/federal_tax_credits)
- U.S. Department of Energy
 - Property Assessed Clean Energy (PACE) Program (<https://energy.gov/eere/slsc/property-assessed-clean-energy-programs>)
 - Solsmart Technical Assistance (<http://www.gosparc.org/>)
- U.S. Department of Transportation
 - Congestion Mitigation and Air Quality (CMAQ) Improvement Program (http://www.fhwa.dot.gov/environment/air_quality/cmaq/)

- FASTLANE Grants (<https://www.transportation.gov/buildamerica/FASTLANEgrants>)
- U.S. Environmental Protection Agency
 - Building Blocks for Sustainable Communities (<https://www.epa.gov/smartgrowth/building-blocks-sustainable-communities>)
 - Environmental Education Grant (<https://www.epa.gov/education/environmental-education-ee-grants>)
 - Environmental Justice Small Grants Program (<https://www.epa.gov/environmentaljustice/environmental-justice-small-grants-program>)