



Advocating Economic, Energy & Environmental Solutions for Arkansas' Future

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Clearing the Air

-An Overview of Air Pollution Abatement Regulation and Progress

Introduction

One of the issues on the forefront of the news today involves increased federal oversight to address carbon dioxide and other emissions resulting from transportation, electricity generation, and other sources. However, this debate is not a new one. For over half a century, the federal government has had regulations in place that address air quality and pollution. At the same time, the electric utility industry has been increasing its efforts to identify and utilize cleaner, more cost-efficient methods of electricity generation. The transportation and building sectors have also seen remarkable improvements. Air quality has significantly improved over the past 55 years as a result of the combination of the federal government and companies taking proactive steps to protect the environment and public health.

President Dwight D. Eisenhower signed into law the Air Pollution Control Act of 1955, the first federal legislation to address air quality which authorized the federal government to study the health effects of air pollution.¹ Although the law did little to restrict pollution, it was the first step in providing research into the health effects associated with pollution, as well as raising public awareness of the issue.

Eight years later, President John F. Kennedy signed the Clean Air Act of 1963, which offered federal research dollars to state and local governments to create air pollution control boards. It also recognized the pollution associated with the burning of high sulfur coal and coal, and it encouraged the use of technology to remove these toxins.

In 1970, President Richard Nixon signed an executive order creating the U.S. Environmental Protection Agency (EPA), which shifted the federal government's role from an advisory position to one that enforced pollution laws. A short time later, Congress passed the Clean Air Act of 1970, which amended the 1963 law by establishing national air quality and vehicle emissions standards as well as criteria for controlling pollution from certain industries.

Though this act has since been amended, it remains the basis for the federal air pollution control policy. In 1977 and again in 1990, Congress amended the Clean Air Act to address issues such as ozone depletion and acid rain.

¹ "Origins of Modern Air Pollution Regulations." EPA. <http://www.epa.gov/apt/course422/apc1.html>

Air Quality Today

Since these early efforts at improving air quality, much progress has been made and new technologies have facilitated new opportunities.

It is important to reflect upon the progress that has occurred since the 1960s. Here are a few examples:

- It would take 20 of today's new automobiles to release the same number of emissions as one 1960s model.
- Sulfur dioxide (SO₂) emissions have been reduced by 38 percent or 13 million tons per year. These emissions are typically associated with large boilers and have been linked to acid rain.
- Dropping 14 million tons per year, volatile organic compound (VOC) emissions have decreased by 42 percent. VOCs react with nitrogen oxides on hot days to form ground level ozone (smog), a respiratory toxicant.
- Particulate matter emissions have been reduced by 9 million tons per year, a 75 percent reduction. Particulates have been linked to respiratory illnesses such as asthma.
- EPA statistics indicate that the total decrease in emissions is about 48 percent across the board, reducing pollution by 109 million tons.

Changing Energy Trends at the National and State Levels

There are numerous changes within the energy industry today, including the development of more energy efficient technologies, new energy sources, and a major focus on improving air quality and reducing greenhouse gas emissions.

Arkansas is playing a key role in the emerging clean-energy sector. According to a June 2009 study by the Pew Charitable Trusts, Arkansas' jobs in the clean-energy sector have grown twice as fast as the overall job-growth rate. In addition to global wind energy companies establishing a presence in the state, such as LM Glasfiber, many of the state's universities are at the forefront of energy research.

Like the nation as a whole, the sources of Arkansas' electricity generation portfolio have improved over the years, as have the technologies which produce or process those sources. Nationwide, the U.S. generated 308,879 thousand megawatt hours (MWh) of electricity in May 2009. The charts below compare the source, number of megawatt hours, and percentage of energy that comes from each source for both the U.S. and Arkansas:

Net Generation of Electricity: United States (January - May 2009)		
Source	Thousand MWh	Percentage
Petroleum	2,061	0.67%
Natural Gas	68,471	22.17%
Coal	132,723	42.97%
Nuclear	65,229	21.12%
Hydroelectric	29,142	9.43%
Other Renewables	11,253	3.64%
TOTAL UNITED STATES	308,879	100.00%

Net Generation of Electricity: Arkansas (January - May 2009)		
Source	Thousand MWh	Percentage
Petroleum	7	0.17%
Natural Gas	604	14.36%
Coal	1807	42.95%
Nuclear	1385	32.92%
Hydroelectric	279	6.63%
Other Renewables	125	2.97%
TOTAL ARKANSAS	4207	100.00%

(Source: U.S. Energy Information Administration²)

Oil, once a primary source of electricity generation because it was convenient and inexpensive, was a major contributor to air pollution. In 1970, 13 percent of U.S. electric power came from oil. Today it is less than one percent, having been replaced by cleaner and more efficient energy sources.

An energy source that produces zero emissions at the point of electricity generation, nuclear energy has played a key role in improving the nation's air quality and environment. In 1970, nuclear energy accounted for less than two percent of total U.S. electricity generation; today it makes up 21 percent. Arkansas has been an even bigger beneficiary from nuclear energy, which today comprises over 30 percent of Arkansas' total electricity generation.

As noted above, 22 percent of the country's electricity supply comes from natural gas, and the EPA estimates that 900 of the next 1,000 power plants constructed will use natural gas.³ One of the drawbacks of natural gas has been its volatile prices, as evidenced during the dramatic spike in prices in 2008.

Additionally, renewable sources such as hydro, solar wind, and biomass have increased in use over the years and this trend is expected to continue. The U.S. Energy Information Administration (EIA) states that renewable energy consumption grew by seven percent from 2007-2008.⁴ Solar energy is expected to become more widely used as utility companies, mostly located in the southwest, add solar power to their portfolio.⁵ According the EIA, total wind capacity was over 23,000 megawatts by the end of 2008 - up from just over 6,000 megawatts in 2004.⁶ Here in Arkansas, biomass (predominantly wood and wood waste) generated nearly two percent of Arkansas' electricity generation in 2007.⁷ For the foreseeable future however, these renewable energy sources will only be able to augment the massive amounts of electricity generated around the clock by base load sources such as coal, nuclear, and conventional hydro.

² Net Generation by State by Sector. EIA. http://www.eia.doe.gov/cneaf/electricity/epm/table1_6_a.html

³ "Energy Sources – Natural Gas." EPA. <http://www.energy.gov/energysources/naturalgas.htm>

⁴ "Renewable Energy Consumption and Electricity Preliminary Statistics 2008." EIA. http://www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/rea_prereport.html

⁵ "Large-Scale U.S. Solar Power Facilities Becoming Commonplace." DOE. http://apps1.eere.energy.gov/news/news_detail.cfm/news_id=11884

⁶ "Renewable Energy Consumption and Preliminary Statistics 2008" EIA. http://www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/rea_prereport.html

⁷ "Arkansas Renewable Electricity Profile." EIA. http://www.eia.doe.gov/cneaf/solar.renewables/page/state_profiles/arkansas.html

Looking Ahead - The Potential of New Technologies

As we look to make our existing energy sources and energy use more clean and efficient, the potential of new technologies cannot be underestimated, and will only continue to improve upon the progress that has been made over the course of the past several decades. Critical to improving our air quality and environment is figuring out the best way to reduce the emissions from our nation's fleet of coal plants.

Technology now exists to remove significant amounts of emissions from coal, and new technologies show great promise to improve the potential for cleaner coal. Here in Arkansas, the White Bluff coal plant, which generates 1,659 megawatts of electricity (enough to power more than 1.5 million average Arkansas homes), plans to install a new coal "scrubber" system that will remove the majority of sulfur dioxide and nitrogen oxides from the plant's emissions. This will be a major step forward for improving Arkansas' energy portfolio. Additionally, the potential of clean coal, as well as the possibility of expanding the nation's nuclear energy capacity and renewable energy sources, can also lead to significant reductions in emissions.

Coupled with new developments in transportation, such as plug-in electric vehicles – and in homes and businesses – such as Leadership in Energy and Environmental Design (LEED) certification and the increased efficiency of ENERGY STAR homes and appliances, we can continue to see steady changes that will enhance our air quality, environment, and quality of life throughout the nation and right here in Arkansas.

Progress Arkansas' mission is to build consensus and support for economic, energy, and environmental policies that will support growth and prosperity for the State of Arkansas. Our membership is comprised of business and community-based leaders dedicated to promoting key solutions that will ensure that the State of Arkansas remains a great place to live, work and do business. www.progressarkansas.com