

Human health and life expectancy influenced by many factors

Critics of coal-based electricity often attempt to link human health solely to the quality of the environment. However, many researchers view this focus as too narrow. There are several contributing factors that have led Americans to improved health, which in turn have led to longer life expectancy.

Consider, for example, the average life expectancy in the United States increased by 31 years from 1900 to 2014. A variety of factors account for this huge increase including improvements in medicine, lower infant mortality rates, better diets, more exercise and better living conditions.

No doubt about it, Americans are living longer – and living better lives than ever before. Americans today, on average, live safer, healthier and longer lives than any generation before them. With affluence afforded by living in the United States, Americans tend to spend more on health care for themselves and their loved ones. They also eat a more nutritious diet and take other precautions that decrease the likelihood of premature deaths from heart disease, cancer and strokes.



78.8
YEARS

the average life expectancy for an American, 2014

A Century of Advancement

The standard of living in the United States over the past 110 years has improved immensely. Think for a minute about living conditions on the North Dakota plains when Theodore Roosevelt was president. Outhouses would dot the towns and the farms. Hospitals would have no penicillin or other antibiotics. Fresh vegetables and fruits were only available locally and in season. Storing meat often meant that it was heavily salted.

Electricity was also considered a luxury. Only people living in towns had electricity, and it was expensive and available mostly for lights at night, and for washing and ironing clothes. Some had automobiles, but most still had horses. Much has changed in the past century.

Today, it is not uncommon to find households with one or more homes – one for living and one for recreation. Likely, both have central heating and air conditioning for personal welfare and comfort, plus refrigerators and freezers to keep food fresh.

Not surprisingly, Americans are demanding more electricity than ever before, not only at home but also at work. Computers and copiers in office buildings and programmable robotics in manufacturing are examples of how America is putting electricity to work and making workers more productive.

In North Dakota, the average age of death in 2010 was 77.5 years, which is up from 71.6 years just 30 years ago.

OTHER FACTORS:

EMPLOYMENT >>

ECONOMY >>

INCREASINGLY
CLEANER >>

Importance of Employment

The importance of a strong economy to human health is an issue that cannot be discarded. Researcher M. Harvey Brenner, Ph.D., has stated that employment and economic growth are the most important factors relating to length of life. Brenner, who is a senior professor of epidemiology at the Berlin University of Technology, and also a professor at the Johns Hopkins University School of Public Health, says that “full employment equals lower mortality rates.”

Low cost, reliable power from coal-based electric generating stations has closely tracked growth in the U.S. economy. In the United States, coal-based power plants account for one-third percent of all the electricity generated on a yearly basis. In the Upper Midwest region, which includes Minnesota and North Dakota, the percentage of coal-based electricity is even higher – roughly two-thirds.

“Employment and economic growth are the most important factors relating to length of life”

Compared to other fuels, North Dakota’s coal-based electricity is less expensive than electricity generated from natural gas or oil. It is more reliable than some intermittent sources, including wind and solar. It also doesn’t have the long-term waste storage issues associated with nuclear power.



Over-regulation could harm domestic economy

Under the Obama Administration, the United States Environmental Protection Agency (EPA) and other federal agencies proposed a number of rules that could have impacted coal-based electricity prices, both nationally and regionally. These proposals could have increased the cost of mining coal, generating electricity from coal along with managing coal ash, and would have made it more difficult to build new coal-based power plants and keep existing plants operating. This “regulation push” increased the uncertainties facing the lignite industry and chilled future growth potential.

The Lignite Energy Council, an association comprised of lignite mines, major lignite users and companies that provide goods and services to the industry, believes the “regulatory push” would have hurt the lignite industry and our regional economy by introducing unrealistic regulatory time frames along with uncertainty as to how the regulations would affect existing and new facilities.

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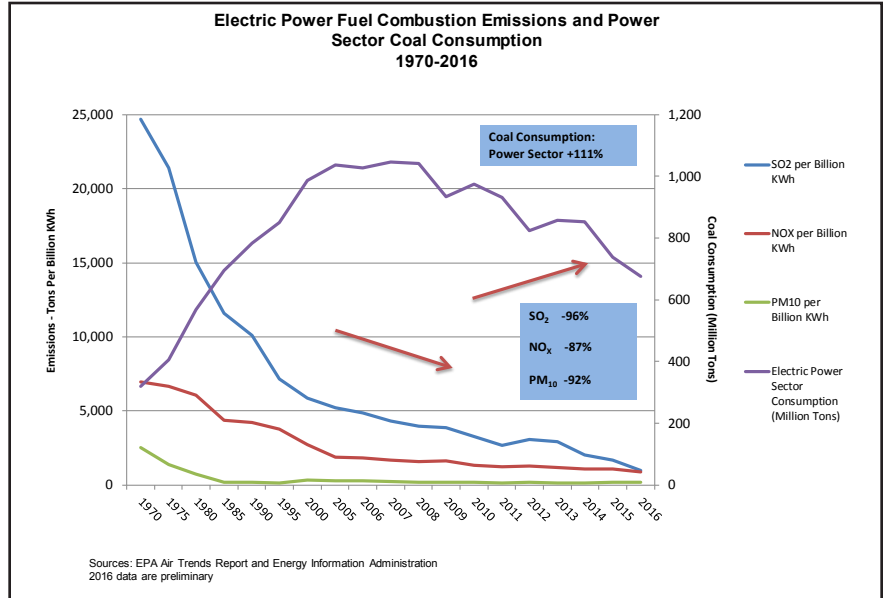
Currently, we have both a clean environment and an expanding energy supply to power our growing, fast-paced economy. However, through over-regulation, the EPA could have markedly changed the economic situation by increasing the price of electricity to the detriment of homeowners and businesses alike.

Increasingly Cleaner

Since the passage of the Clean Air Act in 1970, the amount of coal consumed for electric generation in the United States increased by 111 percent. When taking into consideration the coal-based electricity sector's emissions reductions, combined with increased output, there has been a 96 percent reduction in SO₂, 82 percent reduction in NO_x, and 92 percent reduction in particulates over the past 40 years. These reductions have been made through the investment in several technologies to reduce emissions, including electrostatic precipitators, scrubbers and baghouses, as well as altering the fuel mix.

In North Dakota, home to seven power plants and the nation's only synfuels plant, utilities have invested about \$2 billion in technology to protect the environment and operate this equipment at a cost of \$100 million per year. This has led to significant reductions in three pollutants targeted by the EPA under the Clean Air Act – particulates, sulfur dioxide and nitrogen oxides.

The North Dakota Department of Health notes that the state



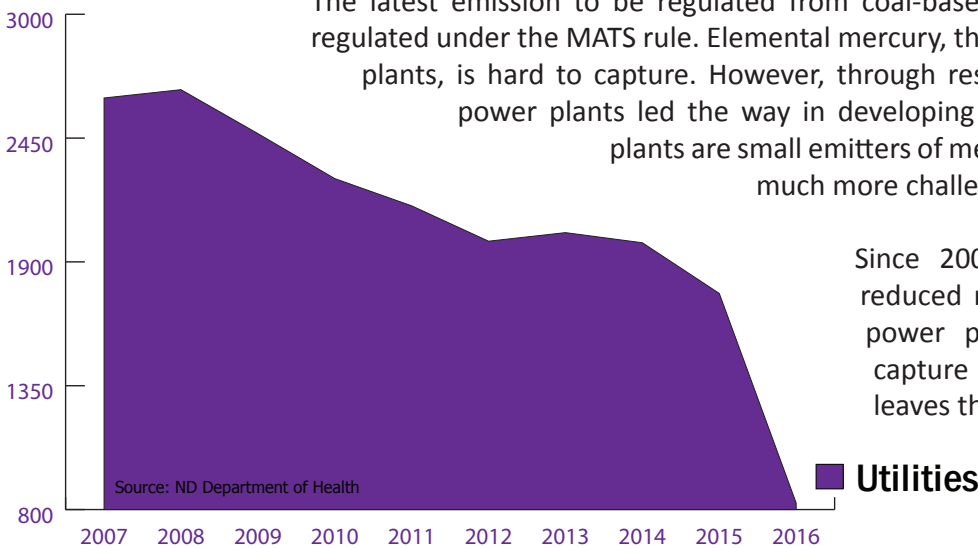
has “relatively clean air” and is one of only 7 states to comply with all federal ambient air quality standards. The air in North Dakota also meets all state ambient air quality standards.

More recently, mercury has also been regulated from coal-based power plants.

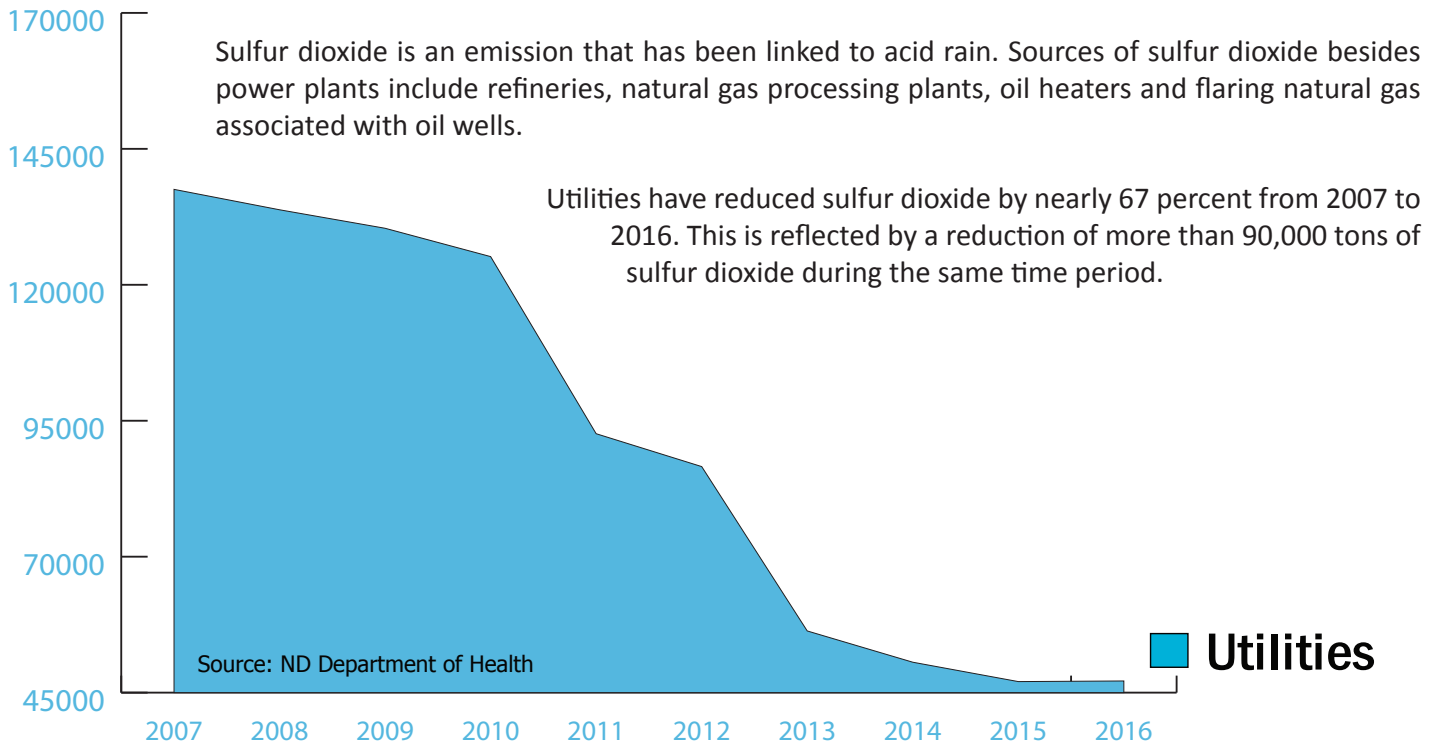
Mercury (Pounds)

The latest emission to be regulated from coal-based power plants is mercury. Mercury is regulated under the MATS rule. Elemental mercury, the type generated by lignite-based power plants, is hard to capture. However, through research and development, North Dakota power plants led the way in developing techniques to capture mercury. Power plants are small emitters of mercury, which made technology discovery much more challenging.

Since 2007, North Dakota power plants have reduced mercury emissions by 68 percent. Each power plant is equipped with technology to capture mercury from the exhaust before it leaves the chimney.



Sulfur Dioxide (Tons)



Nitrogen Oxides (Tons)

