

Pollution in Texas: Closing Coal Plants Cleans the Air

Executive Summary

- In January, Texas released the 2018 Point Source Emissions Inventory (PSEI), a report of all legal pollution from stationary sources such as power plants and refineries.
- The 2018 inventory showed fewer emissions than the year before, with carbon monoxide, fine particulate matter, and sulfur dioxide declining most.
- Electric utilities were responsible for most of the pollution reduction in 2018, **due to the closure of three large coal plants** owned by Texas-based Luminant: Big Brown, Monticello, and Sandow.
- All told, the closure of these three sources removed 151,891 tons of pollution from the air.
- Texas must get serious about reducing pollution from other sources if air quality is to continue to improve.

Introduction

Texas is plagued by a great deal of air pollution. Most of it is unauthorized, meaning it is illegal pollution that represents a violation of a permit and the law. In 2018 there was [135 million pounds](#) of this pollution, more than double the 63 million pounds that occurred in 2017.

Companies are required to report both legal and illegal pollution to the Texas Commission on Environmental Quality (TCEQ). The illegal pollution is reported in near real time at the [Air Emissions Event Report Database](#). The legal pollution is reported over the course of several months. Nearly 2,000 companies have to report their legal air pollution; they do so into a database known as the [Point Source Emissions Inventory \(PSEI\)](#). (Point sources are stationary sources of pollution such as factories and power plants; the term does not include mobile sources such as cars and trucks.)

In January the TCEQ finally release the point source emissions inventory for 2018. In total 1,947 sources reported 907,778 tons of air pollution—more than 1.8 billion pounds.

That is a staggering amount of pollution but believe it or not there was *less* legal pollution emitted in 2018 than in previous years. The Texas Commission on Environmental Quality provides a high-level analysis of this data on their [website](#) (see below).

Annual Inventory Trends					
Pollutant (tpy)	2014	2015	2016	2017	2018
VOC	99,000	98,000	89,000	89,000	89,000
NOx	285,000	259,000	251,000	250,000	248,000
SO2	422,000	335,000	319,000	353,000	282,000
CO	296,000	251,000	270,000	288,000	246,000
PM10	48,000	46,000	44,000	46,000	41,000
PM2.5	34,000	33,000	32,000	33,000	30,000
Total (does not include PM2.5 to avoid double counting particulate matter)	1,150,000	989,000	973,000	1,026,000	906,000

As we combed through this data, we noticed a trend. Most of the pollution reductions were coming from one industry: coal. Specifically, from three coal plants that were closed early in 2018: Big Brown, Monticello, and Sandow. These three plants, all of them owned by Luminant, are responsible for most of Texas' reduction in legal carbon monoxide (CO), fine particulate matter (PM2.5), and sulfur dioxide (SO2) pollution.

Coal Plant Closures

In October 2017 Luminant Energy [announced](#) it would [close](#) three coal plants in Texas. Coal plants are closing because cleaner sources of energy such as wind and solar are becoming cheaper to build and operate. Luminant cited the poor economics of coal in its closure announcements.

The Sandow Plant in Milam County between Georgetown and College Station had two coal units and a total capacity of 1137 MW; it was slated for closure on January 11, 2018. The Three Oaks Mine that supported it also closed.

The Big Brown plant in Freestone County in east Texas had two coal units and a capacity of 1150 MW. Big Brown was supplied by the Turlington Mine which closed in 2017. Big Brown was scheduled to close on February 12, 2018.

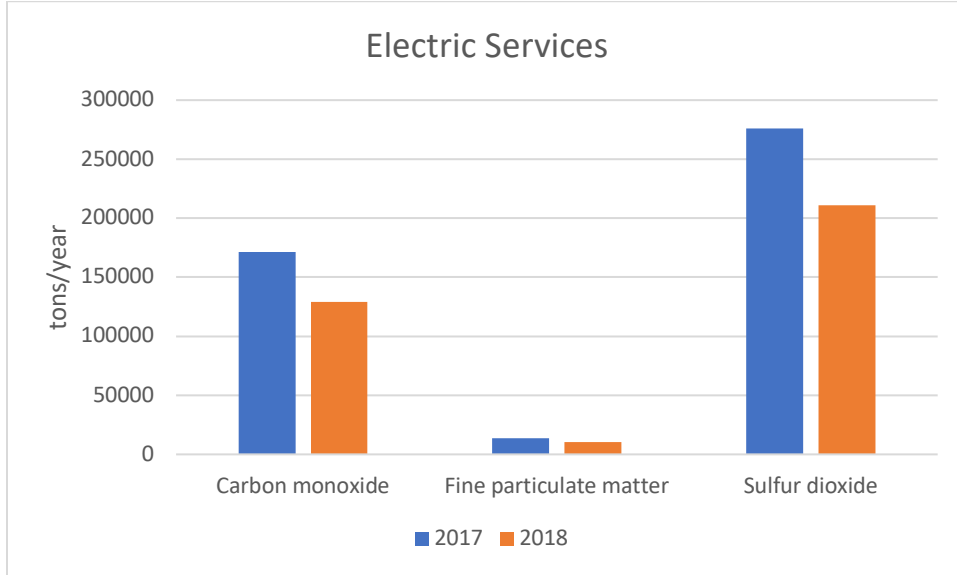
Luminant also announced closure of the Monticello Power Plant in Titus County, also in east Texas. Monticello was a three-unit coal plant with a capacity of 1800 MW. Monticello was expected to close on January 4, 2018.

Pollution by Industrial Sector

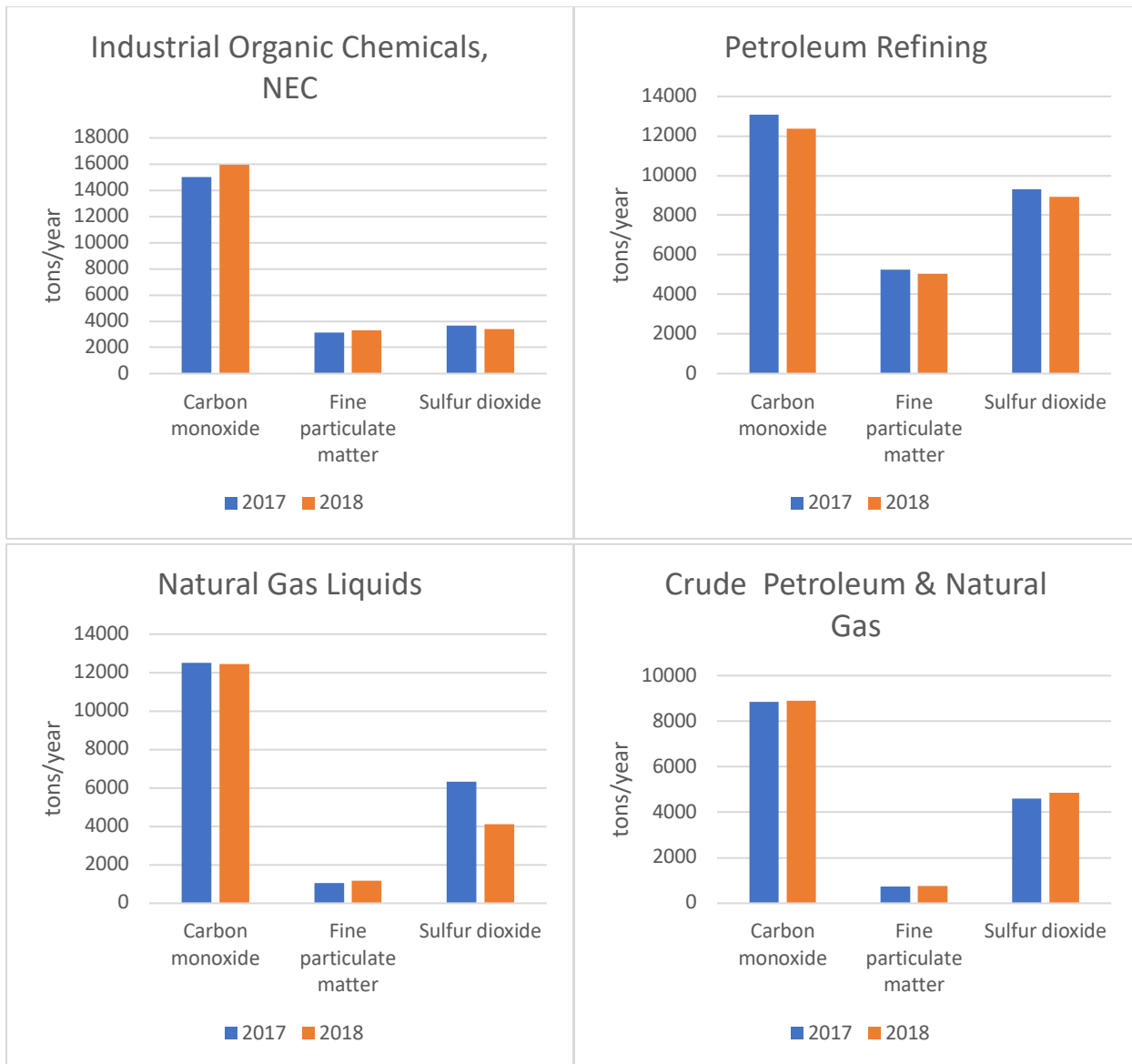
The PSEI organizes point sources by industrial sector using Standard Industrial Classification or SIC codes. Electric services, that is, power generation, is by far the largest source category, with 133 sources putting out 470,625 tons of pollution in 2018. This is more than the rest of the inventory combined, and more than seven times greater than the next largest source. After power generation, the next four most

polluting categories are Industrial Organic Chemicals, petroleum refining, natural gas liquids, and crude petroleum & natural gas.

Electric services showed a clear downward trend for carbon monoxide, fine particulate matter, and sulfur dioxide:



We were curious whether other large source categories showed similar trends, so we looked at the next four largest sources:

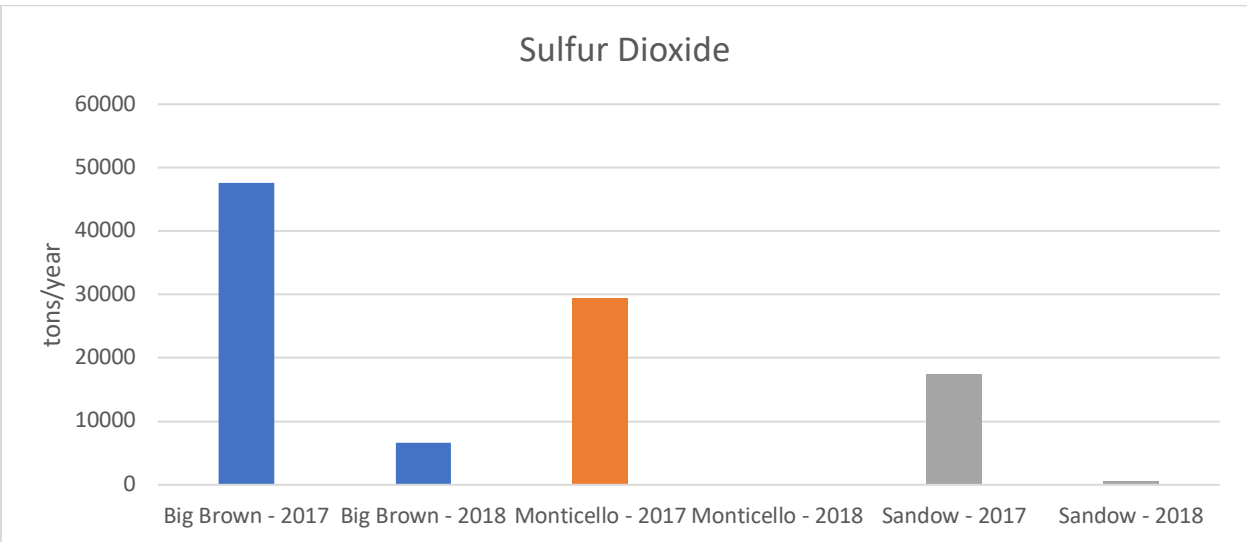
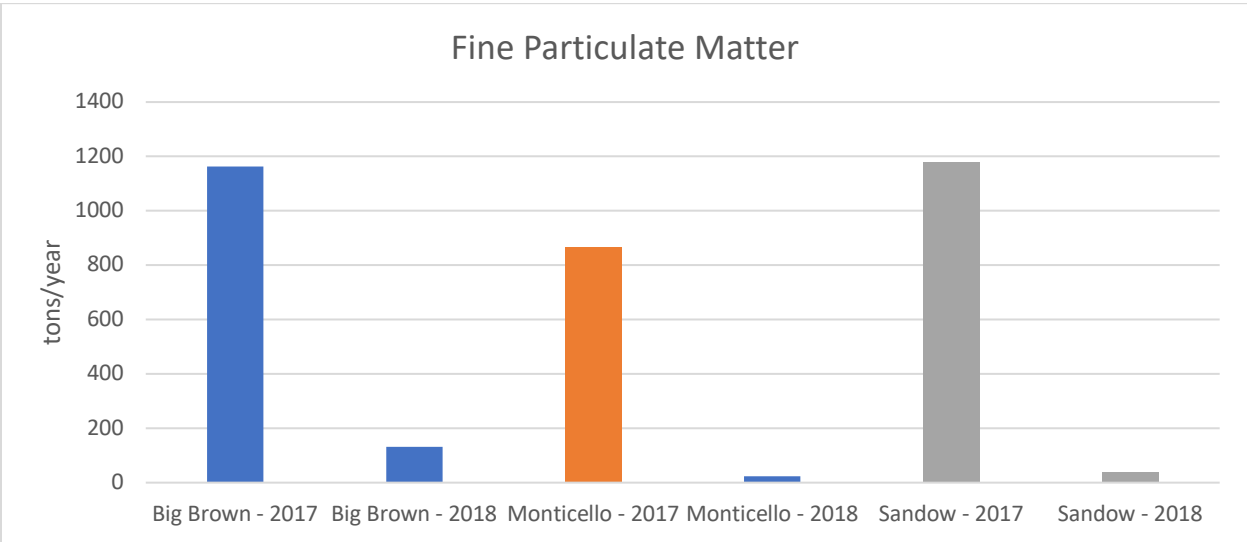
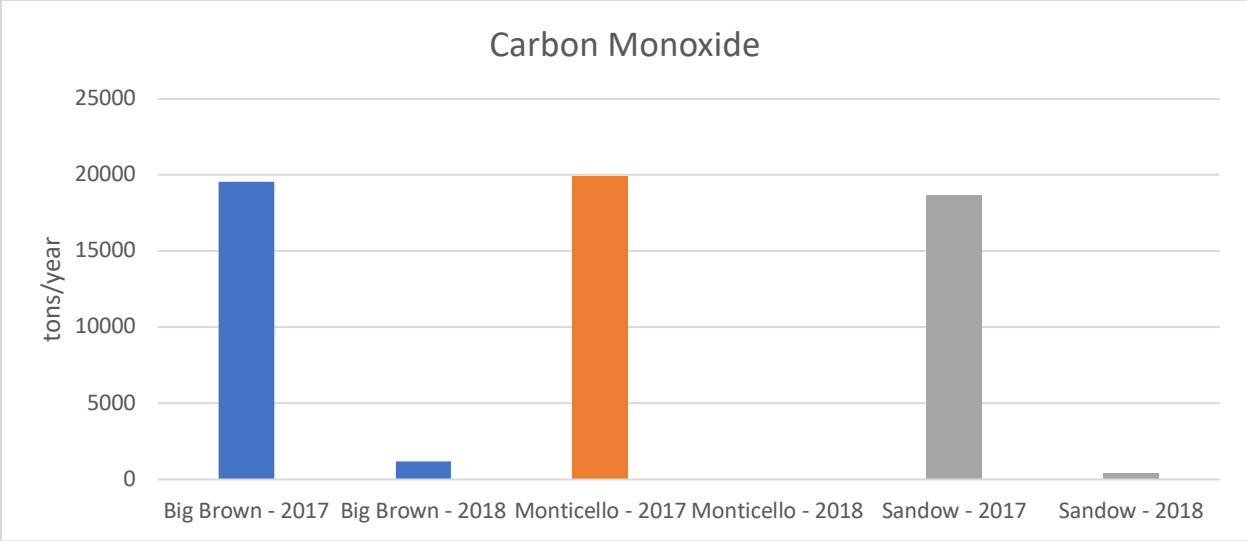


You can see a slight downward trend in petroleum refining, and significant reductions in sulfur dioxide from the natural gas liquids sector, but nothing like the clear trend in electric services. Power generation is clearly responsible for most of our reductions in legal air pollution. And most of those reductions come from just three closed sources.

Avoided Pollution: Big Brown, Monticello, and Sandow

The closures of Big Brown, Monticello, and Sandow led to a dramatic reduction in air pollution. The Point Source Emissions Inventory reports on seven pollutants: carbon monoxide (CO), nitrogen oxides (NOx), lead (Pb), coarse particulate matter (PM10), fine particulate matter (PM2.5), sulfur dioxide (SO2), and volatile organic compounds (VOC). We looked at three of these pollutants—CO, PM2.5, and SO2—because they are common pollutants for coal plants that showed dramatic reductions in the 2018 PSEI.

The charts below show emissions of these three pollutants for each plant in 2017 and 2018. You can see that pollution emissions for 2018 dropped to almost zero.

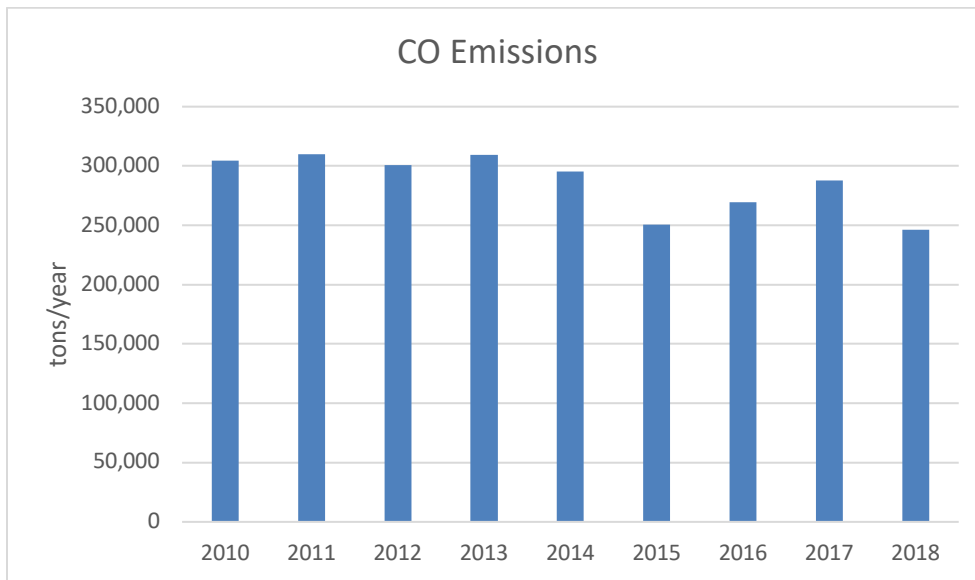


Comparing these reductions to the entire point source emissions inventory for 2018, we can see that most of the reductions statewide came from the closure of these three coal plants.

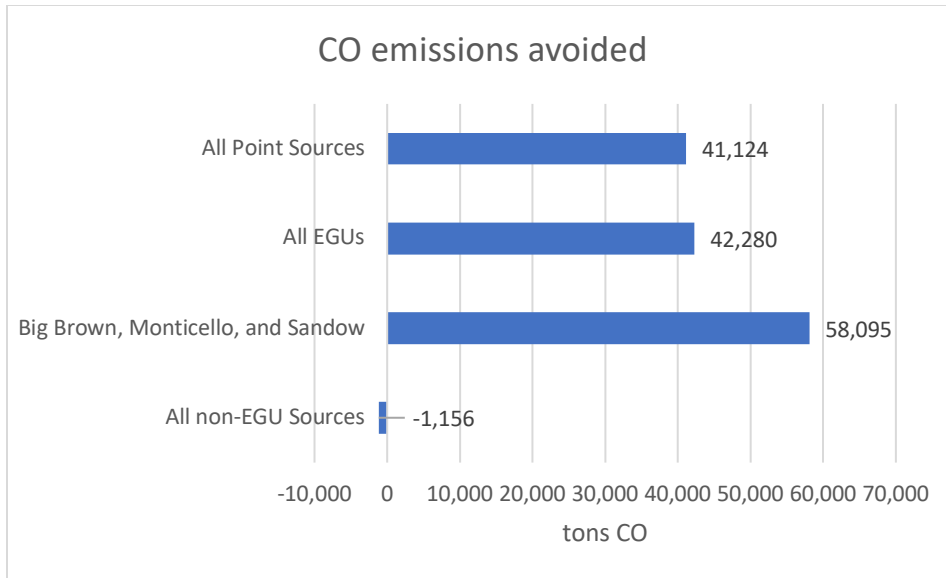
Carbon Monoxide

Carbon monoxide is a colorless, odorless gas that can be dangerous at high concentrations. Exposure to carbon monoxide affects the flow of oxygen in the blood and can cause dizziness, confusion, unconsciousness and death. Carbon monoxide exposure is especially dangerous for people with heart disease, and particularly if they are exercising or under stress.

Reported carbon monoxide pollution decreased from 287,592 tons in 2017 to 246,468 tons in 2018, for a total of 41,124 fewer tons of carbon monoxide—a 14 percent reduction. This is one of the larger reductions in CO in the last decade:



The Big Brown, Monticello, and Sandow coal plants together saw a reduction in 56,583 tons of carbon monoxide. This means that CO pollution *increased* elsewhere in the emissions inventory. This can be seen in the chart below, which plots the change in CO pollution for the entire point source emissions inventory, only the electric generating units (EGUs, 133 sources), just the three closed coal plants, and all of the non-EGU sources in the inventory.

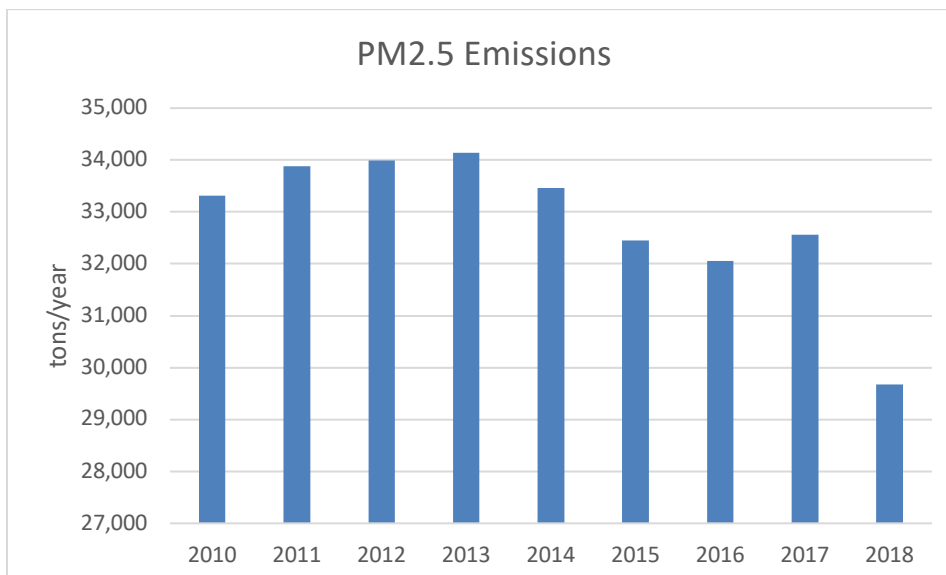


The data clearly shows that EGUs, and especially the closures of Big Brown, Monticello, and Sandow, led reductions in carbon monoxide pollution for 2018.

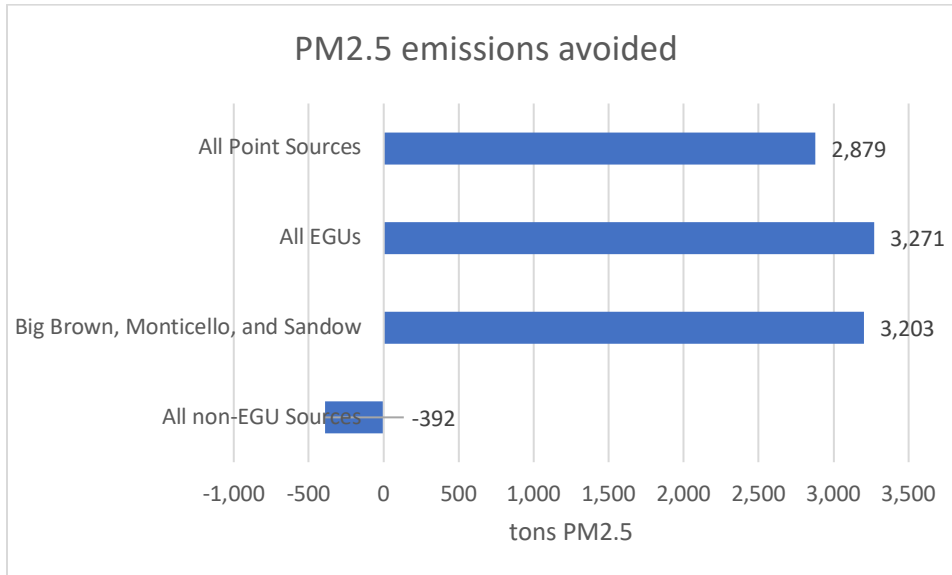
Particulate Matter

Particulate matter consists of liquid and solid particles of various sizes and can be composed of organic matter, chemicals, carbon (soot), heavy metals, and other substances. Coarse particulate matter (PM10) includes particles such as dust that are 10 microns in diameter. Fine particulate matter (PM2.5) consists of particles smaller than 2.5 microns, which is small enough to pass from the lungs directly into the bloodstream. Exposure to particulate matter can cause everything from premature death to heart attacks, stroke, aggravation of asthma, decreased lung function, and an increase in respiratory symptoms such as irritation of the airways, coughing or difficulty breathing.

Fine particulate matter showed the single steepest decline in the dataset, which goes back to 2010. PM2.5 emissions dropped by 2,879 tons, reaching a record low of 29,675 tons.



Comparing net reductions, we again see that EGUs and especially Big Brown, Monticello, and Sandow led the trend of emissions reductions.

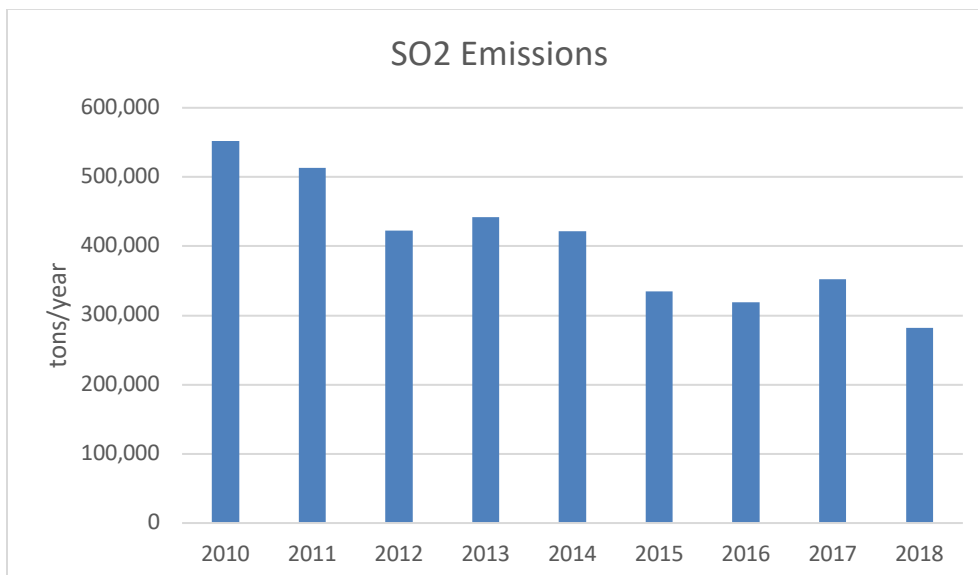


The non-EGU sources in the emissions inventory recorded an increase in 392 tons of PM2.5 pollution in 2018.

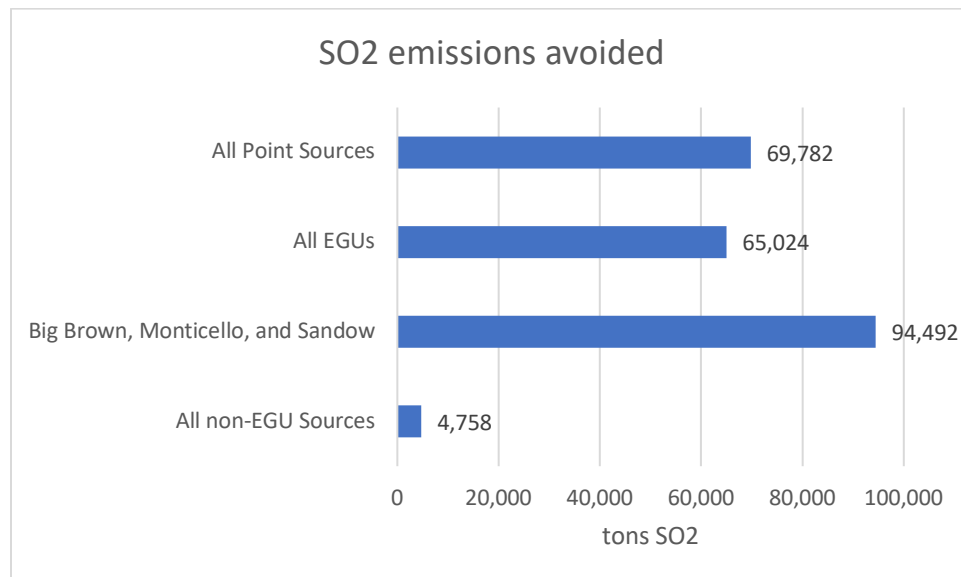
Sulfur Dioxide

Sulfur dioxide (SO₂) is produced from the burning of fossil fuels, particularly those with a high hydrogen sulfide (H₂S) content. Exposure to sulfur dioxide is harmful to the respiratory system and is especially dangerous for people with asthma or other respiratory ailments. Sulfur dioxide pollution can also harm vegetation and contribute to acid rain formation.

Sulfur dioxide may be the pollutant most associated with coal plants. A look at the point source emission inventory for the last several years shows significant reductions in SO₂ pollution in 2018.



Comparing the avoided SO₂ pollution from these plants to the rest of the inventory, we find that three coal plants eliminated far more SO₂ pollution than the rest of the sources across the state.



In this case, all source categories saw SO₂ reductions, with the non-EGU sources contributed 4,758 tons of avoided SO₂ pollution. The EGU industry only reduced SO₂ pollution by 65,024 tons of SO₂. When we remove Big Brown, Monticello, and Sandow from this figure, we find that the remaining EGUs actually *increased* SO₂ pollution by 29,468 tons. Reductions from the non-EGU sources and the especially three retired coal plants drove SO₂ reductions in Texas.

Conclusion

Air pollution affects everyone in Texas, although some are affected more than others. Some communities have higher rates of asthma, cancer, and even shorter life expectancy as a result of air pollution. Communities living near electric power plants—especially coal plants—can be deeply affected by them. **This data clearly shows that closing coal plants as quickly as possible is the best way to reduce legal air pollution.**

If Texas is reducing legal point source pollution, it is only because coal plants are closing. Without the closure of Big Brown, Monticello, and Sandow, certain pollutants would have increased in 2018. There are more coal plants to retire, but Texas must get serious about reducing pollution from other industries as well. The lack of progress in the refining and chemical industries is troubling. This is especially true considering the [massive planned expansion](#) of the oil and gas industry on the Gulf Coast (Note: the linked report discusses carbon pollution emissions, which are not counted in the Point Source Emissions Inventory).

The health and welfare of Texans depends on decreasing pollution from point sources. Texas must get serious about increasing controls on all industrial sources of pollution and limiting permitted air pollution releases.