

COAL-FIRED POWER PLANT EMISSIONS FACTSHEET

TAYLOR RESIDENTS UNITED FOR THE ENVIRONMENT (TRUE) & WILDLAW¹

WHAT ARE COAL-FIRED POWER PLANTS?

Coal-fired power plants are power plants or energy conversion centers that utilize coal to produce electricity.

WHAT ARE THE DIFFERENT TYPES OF COAL-FIRED POWER PLANTS AND HOW DO THEY WORK?

PULVERIZED FUEL (PF)

Coal from mines are transported to the power plant and crushed into a fine powder. The powder is then mixed with air and blown into the furnace, which quickly catches on fire. Millions of gallons of water are pumped into the furnace to create steam, which is then used to spin turbines. The spinning turbines turn shafts inside generators, creating electricity. PFs have been in use for more than 60 years, are highly inefficient, and are the dirtiest type of coal-fired power plants (*i.e.* produce the most pollution). The majority of the coal-fired power plants in the world are this type.

INTEGRATED GASIFICATION COMBINED CYCLE (IGCC)

IGCC is a breakthrough process, which uses coal in a clean, economical and environmentally efficient manner to produce power. The process is accomplished by treating domestic coal to remove its sulfur content prior to burning. In this process, the coal is converted to gas. Air used in the combustion process is separated into nitrogen and oxygen: the nitrogen is used to cool the turbine and the oxygen is mixed with the gasified coal, then burned. The outcome is power production requiring 15 percent less fuel, achieving 10-12 percent more efficiency than normal generating stations. And, by reusing exhaust heat, additional electricity is produced. This combined-cycle process is the most cost-efficient method today of producing commercial electricity. If a coal-fired power plant is going to be built in your community, then this is the type that is the most environmentally friendly with respect to air emissions.

FLUIDIZED BED COMBUSTION (FBC)

FBCs are the most important, being applied often to small markets for co-firing of coals with various waste streams. Of the variations of FBCs in operation, circulating FBCs are the most commonly used for power generation purposes. There are only a handful of pressurized (PFBC) plants in operation in the world; This may not be a feasible option for Taylor County.

WHAT IS COAL AND HOW IS IT CREATED?

Coal is a combination of prehistoric plants and greenery that originally accumulated in swamps and peat marshlands. The movement of the earth's surface and the build-up of soil and other residues buried these swamps and peat marshlands deep into the earth. The combination of high temperatures and pressures physically and chemically changed the buried prehistoric plants and greenery, thus creating coal.

WHAT ARE THE DIFFERENT TYPES OF COAL?

ANTHRACITE

Anthracite has the highest carbon content (the higher carbon content = the better it burns) and represents a small segment of the United States coal market. There are only 7.3 billion tons of anthracite in the United States, most of which is found in 11 northeastern counties in Pennsylvania. It is the best and most environmentally friendly type of coal, commonly referred as "smokeless coal."

BITUMINOUS

Bituminous is the most common form of coal in the United States. It has a medium to high carbon content and, it is primarily used for generating electricity through coal-fired power plants and making coke for the steel industry. This type of coal is not as environmentally friendly as Anthracite or Sub-Bituminous.

SUB-BITUMINOUS

Sub-bituminous has a low to medium carbon content, and it is most commonly found in Alaska and the Western United States. Although its carbon content is lower than Anthracite and Bituminous, its Sulfur content is less making it a cleaner burning coal.

LIGNITE

Lignite has the lowest carbon content of the four types of coal. It is common called "Brown Coal" and is mainly used for steam-electric power generation. This the worst type of coal.

¹Factsheet created by Shereitte C. Stokes IV, Florida A&M University, for TRUE and WildLaw. This activity was funded by ATSDR/MHPF (Grant # U50/ATU473408-03).

WHAT KIND OF AIR POLLUTION IS MADE BY COAL-FIRED POWER PLANTS?

MERCURY (Hg)

Mercury is a metal that is found in air, water, and soil. It exists in several forms: elemental or metallic mercury, inorganic mercury compounds, and organic mercury compounds.

SULFUR DIOXIDE (SO₂)

Sulfur dioxide is a colorless gas with a pungent odor. It is a liquid when under pressure, and it dissolves in water very easily.

NITROGEN OXIDES (NO_x)

Nitrogen oxides are a mixture of gases that are composed of nitrogen and oxygen. Two of the most important nitrogen oxides are nitric oxide and nitrogen dioxide; both are nonflammable and colorless to brown at room temperature. Nitric oxide is a sharp sweet-smelling gas at room temperature, whereas nitrogen dioxide has a strong, harsh odor and is a liquid at room temperature, becoming a reddish-brown gas above 70°F.

PARTICULATE MATTER (PM)

Particulate Matter, also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles.

LEAD

Lead is a bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

CARBON DIOXIDE (CO₂)

Carbon Dioxide is a colorless, odorless, non-poisonous gas that is a normal part of air and, is product of fossil fuel combustion. It is a greenhouse gas that contributes to global warming.

HOW CAN THIS POLLUTION AFFECT YOUR HEALTH?

Pollution from coal-fired power plants can cause the following health problems:

- Asthma
- Bronchitis
- Breathing difficulties
- Shortness of breath
- Severe airway obstruction
- Eye, nose, & throat irritation
- Lung damage
- Anemia
- Diarrhea & Vomiting
- Drowsiness & Tiredness
- Dizziness & Unconsciousness
- Convulsions & Tremors
- Nausea
- Shyness
- Irritability
- Loss of Controlled & Purposeful Activity
- Weakness in Fingers, Wrists, & Ankles
- Changes in Vision or Hearing
- Brain damage
- Kidney damage
- Heart Attack (non-fatal)
- High blood pressure
- High or irregular heart beat
- Damage to unborn children including miscarriage
- Decrease in sperm production which may lead to infertility
- Skin rashes
- Spasms
- Coma
- Death

Taylor County ranks among the worst Counties in Florida in:

- Asthma Hospitalizations
- Lung Cancer Deaths
- Chronic Lower Respiratory Disease Hospitalizations

NOW ASK YOURSELF, HOW CLEAN IS YOUR AIR?