

Cardinal Power Plant: How We Generate Electricity



Coal arrives at the station by truck, rail, or barge and is stored in the coal yard. Conveyor belts carry the coal into the plant, where pulverizers grind it into a fine, talcum-powder-like consistency. The powdered coal is injected into the steam generators, where it burns at high temperatures, turning water into steam.

The steam is directed into the turbines, where it turns blades, much like wind turns a windmill. The spinning turbine drives a generator that produces electricity. Exhaust steam from the turbine is cooled in the condenser and returned to the steam generator to start the process again.

Electricity is generated the instant that a customer needs it. Cardinal's generators produce electricity at 23,000 to 25,000 volts. Transformers outside the plant step up the voltage to 138,000 and 345,000 volts so it can be transmitted efficiently to consumers' homes, farms, and businesses.

Cardinal Plant occupies a unique place in the history of electric power generation. Built in 1967,

it represents the first alliance of an investor-owned electric utility — **American Electric Power (AEP)** — and a consumer-owned electric utility — **Buckeye Power**, the power generation arm of **Ohio's Electric Cooperatives** — to build and operate a power plant to serve both sets of consumers. Buckeye Power is owned and governed by 25 rural and suburban electric cooperatives that collectively serve about 1 million Ohioans.

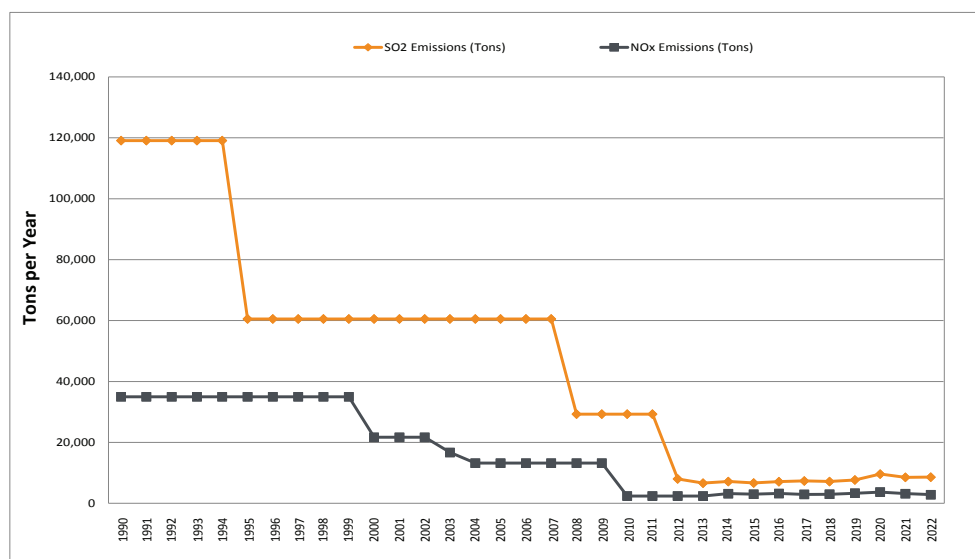
In August 2022, the co-ownership of Cardinal Plant ended. Buckeye Power bought Unit 1 from AEP, and now owns all 3 units at Cardinal Plant. Buckeye Power has an agreement with AEP to sell AEP the power from Unit 1 through December 2028. Units 1 and 2 each have a generating capacity of 590 megawatts (MW). Unit 3 has generating capacity of 620 MW. Buckeye Power operates the facility on behalf of all owners. Over a decade and culminating in 2012, Buckeye Power invested \$1.2 billion in emissions-control equipment on Units 2 and 3, making it one of the cleanest power plants of its kind in the world.

Ohio's Electric Cooperatives

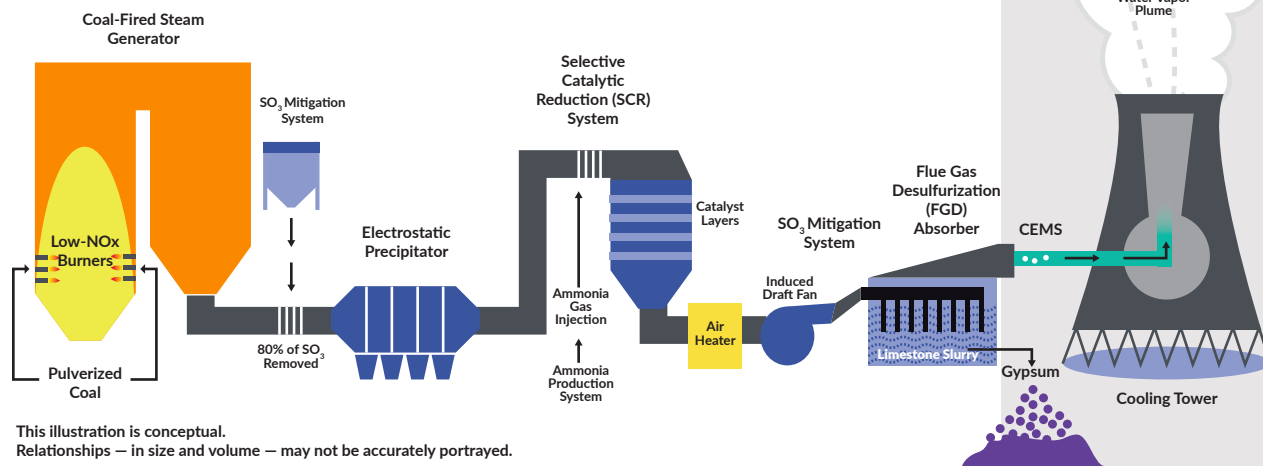
Buckeye Power is a generation and transmission cooperative owned by and supplying electricity to the electric distribution cooperatives in Ohio. The cooperatives' certified service territory covers nearly 40 percent of the land area in the state and encompasses 77 of Ohio's 88 counties. The cooperatives collectively serve nearly 400,000 homes, farms, and businesses — about 1 million Ohioans in total.



SO₂ and NO_x Emissions Trends from Cardinal Plant



Unit 3 Cardinal Plant Emission Control Systems — \$1.2 billion



Quick Facts About Cardinal Power Plant

- Location: Along the Ohio River, south of Brilliant, Ohio
- Capacity: 1,800 MW total
- Units: 3
- Stack height of units 1 and 2: 1,000 feet
- Unit 3 cooling tower capacity: 16.8 million gallons per hour
- Average annual coal use: 5.2 million tons
- Coal yard storage capacity: 1.3 million tons
- Average daily coal use: 15,800 tons
- Employees: 260