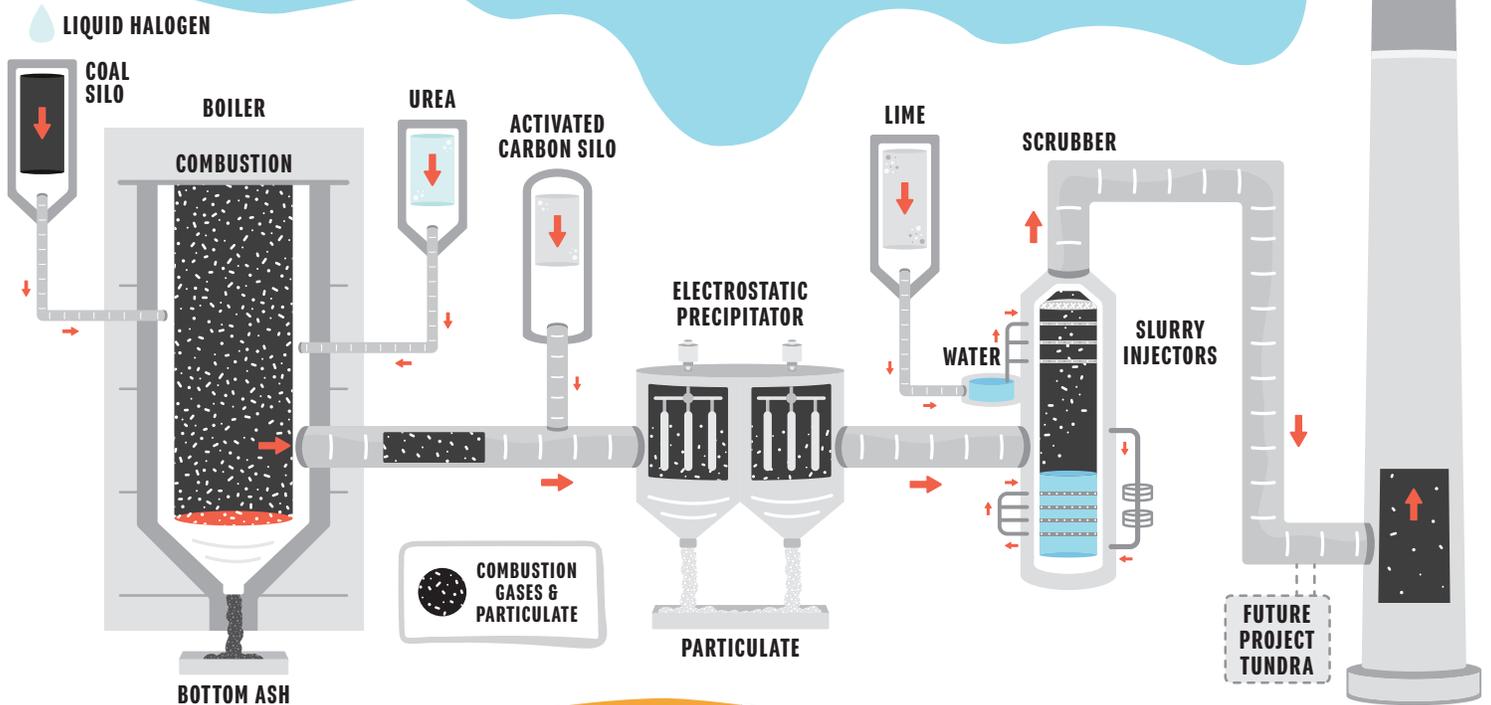


REDUCING EMISSIONS

Cass County Electric Cooperative and Minnkota Power Cooperative, the region's wholesale power provider, are committed to maintaining a clean and healthy environment. One of the greatest success stories in recent years is the significant reduction in emissions levels at the coal-based Milton R. Young Station. From 2007 to 2011, about \$425 million was invested in cutting-edge air quality technologies. Efforts are also under way to advance innovative carbon dioxide (CO₂) capture systems at the Young Station – an initiative known as Project Tundra.

While about 42% of our electric generating capacity comes from carbon-free resources, coal-generated electricity remains vital to ensuring reliability and resiliency of electric service. The Young Station operates at high production levels throughout the year, including during extreme hot and cold weather periods. And thanks to technology advancement, the energy produced is cleaner than ever before.



MERCURY REMOVAL

Liquid halogen and activated carbon

A combination of liquid halogen and activated carbon absorb mercury from the flue gas. Fly ash and mercury will be removed by the electrostatic precipitator later in the emission control process.

NITROGEN OXIDES (NO_x) REDUCTION

Selective Non-Catalytic Reduction (SNCR) and Over-Fire Air (OFA)

The Young Station uses a combination of SNCR and OFA to reduce NO_x emission. SNCR includes injecting urea into the boiler to break down the NO_x, while OFA includes diverting a portion of the combustion air from the cyclones to limit the formation of NO_x in the boiler.

PARTICULATE MATTER (PM) REMOVAL

Electrostatic precipitator

The flue gas passes through electrodes, which charge particulates (like dust) either positively or negatively. The charged particles are then attracted to collector plates carrying the opposite charge and removed.

SULFUR DIOXIDE (SO₂) REMOVAL

Scrubber

When the flue gas passes through the scrubber, it flows against multiple levels of spray nozzles containing lime slurry. A chemical reaction occurs between the sulfur dioxide in the flue gas and the lime slurry, effectively capturing the SO₂ and forming a common mineral called gypsum.