How Power Plants Are Reducing Air Emissions

This simplified diagram is illustrative of the operations at a large coal-based electric power plant. It explains the various control technologies in place at many U.S. power plants to reduce emissions to air, land, and water. These technologies are designed to control emissions of nitrogen oxide (NOx), sulfur dioxide (SO2), and particulate matter (PM). In addition, these control technologies capture significant amounts of other air emissions, including mercury. The diagram also illustrates the ways that byproducts of coal combustion are recycled into useful products.

**Steam Generator (Boiler)**
A large vessel that contains an assembly of tubes in which water is heated to steam that is then used to drive a turbine.

**Coal**
The most abundant and cost-effective domestic fuel for generating electricity.

**Primary Air Fan/Pulverizer**
Devices used to prepare coal for burning by grinding it to a fine powder, and drying and mixing it with hot air to create an efficiently combustible fuel.

**Burner**
A nozzle device, generally located in the lower boiler walls, which introduces the pulverized coal into the boiler and mixes with the correct amount of additional air to burn the fuel efficiently and to reduce NOx and carbon monoxide emissions.

**Cooling System**
A system that cools steam passing through the condenser.

**Transformer**
An electromagnetic device that increases the output voltage of the generator while reducing the current (amperage) to make the transmission of electricity more efficient.

**Stack**
A chimney used to exhaust and disperse the hot flue gases from the boiler.

**Precipitator/Baghouse**
Devices used to capture PM and fly ash.

**Precipitator**
A device used to remove SO2 from the boiler exhaust (flue) gas.

**Emissions Monitoring**
Utilities continuously measure many different types of air emissions.

**Cooling Water**
A device that converts the steam from the turbine back into water, to be recirculated to the boiler, where it is heated and used again.

**Electricity**
Electric utilities have reduced air emissions significantly, while increasing electricity production and tripling the use of coal since 1970.

**Source:** Edison Electric Institute
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