Technology Overview

ECO®

Our patented Electro-Catalytic Oxidation technology, known as ECO, is an advanced multi-pollutant control technology that reduces emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_X), oxidized mercury, and fine particulate matter ($PM_{2.5}$) in a single system. The ECO process also produces a commercial grade ammonium sulfate fertilizer co-product.

Our technology can be applied to new coal-fired electric power plants or retrofit into existing plants.

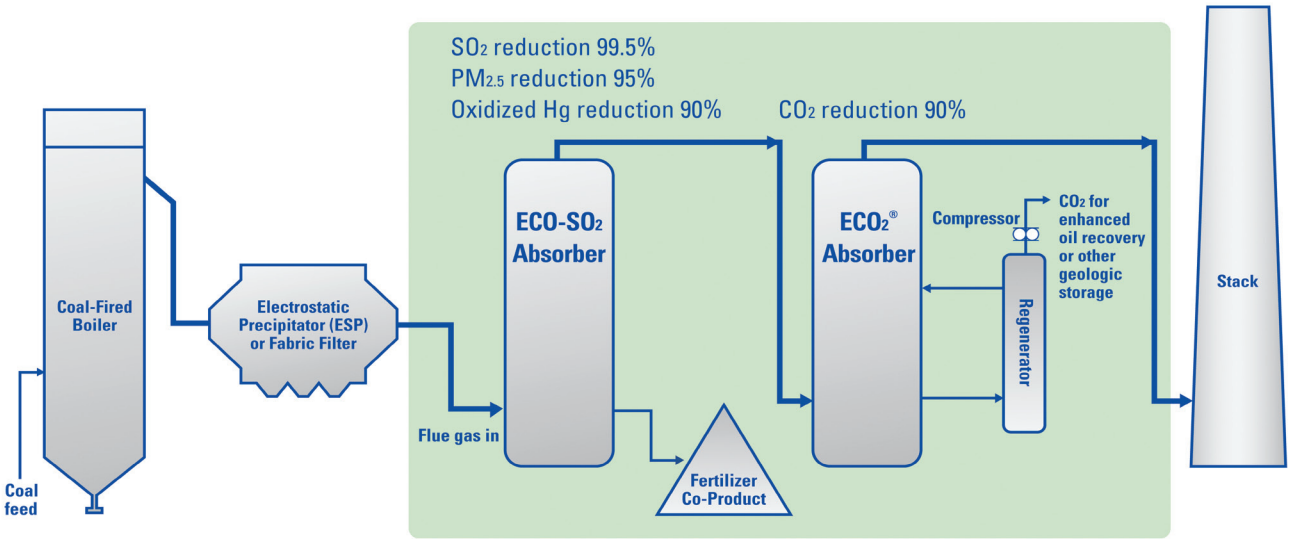
ECO-SO_2

In applications where NO_X removal is not required, our ECO technology is installed without the NO_X control component. Our resultant ECO-SO_2 absorber installation achieves major reductions in emissions of SO_2, $PM_{2.5}$, and oxidized mercury. This process also produces a valuable fertilizer co-product that is ready for sale to the fertilizer market.

ECO_2®

ECO_2 is a post-combustion CO_2 capture process designed to capture 90 percent of CO_2 from the flue gas of coal-fired power plants. Once the CO_2 is captured, it is dried and compressed and then is ready for pipeline transport and sequestration. This technology has been pilot tested at FirstEnergy Corp.'s R.E. Burger Plant and as concluded in a 2010 independent assessment, the technology is ready for scale-up for use in commercial scale (200 MW or larger) generating plants. The ECO_2 technology can be installed following conventional SO_2 scrubbing technology (such as a limestone forced-oxidation SO_2 scrubber) or following our ECO or ECO-SO_2 technologies.

ECO-SO_2 and ECO_2® System Installation



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Project Highlights

FIRSTENERGY ECO® COMMERCIAL UNIT

The 50-MW ECO unit was built at FirstEnergy's R.E. Burger Plant, which is situated on a 100-acre site in south-eastern Ohio on the Ohio River. The ECO unit was designed and constructed to utility standards and has processed flue gas from high sulfur Ohio coals, and blends of Eastern bituminous and Powder River Basin coals.

- 50-megawatt (MW) ECO commercial unit
- In operation from February 2004 - December 2010
- 180-day performance test specified by US EPA completed successfully; ECO qualified as best available control technology (BACT)
- EPRI-sponsored study concluded ECO is as reliable as conventional emissions control technology (>99% available)
- Operated in ECO and ECO-SO_2 configurations
- ECO and ECO-SO_2 performance provides ultra-low SO_2 and SO_3 emissions (~1 ppm)

FIRSTENERGY ECO_2® PILOT FACILITY

Our ECO_2 pilot facility draws flue gas downstream of our 50-MW ECO unit at FirstEnergy's R.E. Burger Plant. An independent assessment completed by WorleyParsons Group Inc. in 2010 concludes that the ECO_2 pilot facility is well designed, instrumented, and operated, and that it provides a sound basis for the design and construction of a full-scale commercial ECO_2 system.

- 1-MW unit; designed for 20 tons per day CO_2 capture; >25 tons CO_2 per day achieved
- Uses commercial equipment
- Commissioning completed and operations began in December 2008; testing concluded December 2010
- CO_2 removal >90% at full design flow from inlet gas containing 11-12% CO_2
- Product CO_2 was purified to meet industrial pipeline specifications
- Pilot has demonstrated it can adapt to the normal changes of an operating power plant
- Provides design basis for commercial systems

Rev. 03/2011

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