

Lonza (formerly Arch Chemicals) - Condensing Economizer Project

- **\$450,000** **Stimulus funds dispersed for Arch project**
- **4,800** **Brandenburg worker hours used in Kentucky to complete the project**
- **1,800** **Kentucky contractor worker hours used to complete the project**
- **1,975** **Estimated annual tons of greenhouse gases/CO2 emission reduction**
- **\$186,500** **Projected annual natural gas cost savings**

Lonza Microbial Control's Performance Urethanes manufacturing facility in Brandenburg, Kentucky (formerly an Arch Chemicals business), has completed a major sustainability project that more efficiently recovers heat from natural gas boilers. This project eliminates approximately 1,975 tons of greenhouse gas emissions per year and saves an estimated \$186,500 annually in reduced consumption of natural gas fuel.

Lonza's Brandenburg operation was one of seven Kentucky companies that received an Industrial Facility Retrofit grant from the Kentucky Economic Development Cabinet in 2010. The stimulus funds provided 60% of the project cost. The funding, which was provided to the state by the U.S. Department of Energy through the American Recovery and Reinvestment Act of 2009, was used by the companies for energy-efficiency upgrades of their manufacturing facilities. Lonza is pleased to share this vital sustainability project as a "showcase" for other Kentucky businesses that may have an interest in this type of heat recovery technology.

Ron Gombos, Production Superintendent at the Lonza Kentucky plant, explains that the grant money was used to add a condensing economizer to two of the plant's steam boilers (350 psi) to reduce the consumption of natural gas. The economizer lowers the flue gas temperature and condenses a portion of the water in the flue gas into a liquid. The heat that comes from the condensation is used to assist in pre-heating the water that is used to produce steam.

Propelled by Lonza's focus on sustainability, the Brandenburg plant team identified the need for and value of this project after reviewing the performance of the plant's three package boilers. They all were equipped with standard economizers to recover "sensible heat" from the combustion exhaust gas. This recovery method leaves a significant amount of energy ("latent heat") in the air stream that leaves the exhaust stack. Moreover, if the plant removed all of the sensible heat, the stacks on the boilers would experience severe corrosion. The new condensing economizer not only recovers the remaining sensible heat, but it recovers heat from the water vapor as it condenses.

The initial phase of the project involved capturing a portion of that lost energy by installing a condensing economizer on one of three boiler stacks. The scope of the project included installing a pre-engineered, skid-mounted, condensing economizer unit; ductwork and piping to tie into the existing boiler stack and water piping; an electrical feed to the new fan and damper; new instrument lines and programming for control of the unit through the plant's existing system; as well as the concrete and steel required to support the condenser and associated equipment.

The new condensing unit was integrated into the facility's existing distributive control system platform. The flow rate through the economizer varies based on steam demand. The operator-friendly unit is very reliable and provides easy startup and shut down. The recovery system operates independently of the steam generation equipment eliminating any potential disruption to plant production.

The second phase of the project involved tying in the exhaust gas from a second boiler. The plant has been recovering energy since May of 2011 and continues to optimize energy savings. Current natural gas savings obtained from recovering heat from one boiler is \$110,000 per year. Currently, operational issues have limited heat recovery from the second boiler. When the operational issues are resolved, natural gas savings are expected to be \$186,500 per year.

Lonza is very appreciative of the opportunity to partner with the Kentucky Economic Development Cabinet on this important sustainability project. We expect the project to provide positive benefits for many years to come.

Original exhaust configuration of boiler with primary economizer going directly to outlet stack



New Condensing Economizer with exhaust gas from two boilers being rerouted to take advantage of remaining "latent heat"

