

West Campus Cogeneration Facility

Air Quality

The West Campus Cogeneration Facility provides reliable heating and cooling for the UW-Madison campus and 150 megawatts of electricity for MGE customers.

Through the efficiency of cogeneration, this single facility can responsibly meet the multiple energy demands of the community and campus. The facility began producing power in spring 2005.

The natural gas-fired plant is one of the cleanest in the Midwest. MGE worked with community members to take steps beyond current environmental regulations. Through innovative mitigation measures, MGE is offsetting air emissions and water use from the power facility.

Proven technology reduces emissions

When designing the plant, MGE worked to ensure the facility meets all air quality standards that are set to protect human health and the environment.

As part of the permitting process, MGE surveyed proven pollution control technologies and practices available worldwide. The company then ranked those technologies in order of performance and chose the top performers to control the facility's air emissions. This is called the "Best Available Control Technology" (BACT) process.

For example, the facility's emission levels that contribute to ozone are lowest compared to any other similar plant in the state. BACT, combined with the efficiency of cogeneration, also produces markedly fewer greenhouse gases.

The plumes from the facility's exhaust stacks are mainly comprised of condensed water vapor with carbon dioxide (CO₂) and a small component of other emissions. Complete combustion of any fuel creates these by-products. The facility's efficient use of natural gas reduces the CO₂ about 15% and nitrogen oxide (NO_x) emissions about 80% compared to separate electric generation and heating/cooling facilities.

Emission control strategies

These BACT technologies and practices reduce emissions:

- A selective catalytic reduction unit that minimizes the NO_x emissions.
- Catalytic oxidation that reduces carbon monoxide (CO) and volatile organic compounds (VOCs) emissions.
- Use of natural gas that minimizes impacts associated with coal such as heavy metals (mercury), sulfur dioxide (SO₂)—a main contributor to acid rain—and solid waste from coal ash.
- Relying on ultralow sulfur diesel fuel for a backup fuel that reduces SO₂ and particulate emissions.
- Good combustion practices that minimize NO_x, VOCs and particulate matter (PM) emissions.

Emissions modeling protects human health

The Wisconsin Department of Natural Resources performed extensive modeling to ensure that emissions from this facility meets stringent National Ambient Air Quality Standards (NAAQS). An analysis was done for NO_x and for all PM, CO and SO₂ emissions. The

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NAAQS standards were set in the Clean Air Act at levels to protect human health, including sensitive populations, with an adequate margin of safety.

Working with the community

MGE worked with the community to take steps beyond current state and federal regulations. MGE signed memorandums of understanding with environmental, consumer and neighborhood groups and with the City of Madison.

These memorandums established steps to offset the facility's emissions of PM, NO_x and SO₂.

MGE accomplishes these offsets through a variety of voluntary strategies, including fuel switching and the combustion of preconsumer waste at other energy-producing facilities.

In addition, MGE made these commitments:

- PM 2.5 monitor and data - MGE and the City of Madison installed equipment on the near-west side to monitor PM. Data is available at www.cogenadvisory.com/advisory/air_monitoring.htm.
- VOC reductions - MGE installed advanced vent caps on the gasoline storage tanks on local gas stations. The caps reduce VOC emissions, a significant contributor to ozone.

- A \$220,000 renewable energy project - We are installing 37 photovoltaic fixtures that use clean solar energy to light a section of a bike path along Campus Drive. The bike path will open in spring 2008.

- Ultralow sulfur diesel fuel – This cleaner fuel was used in all MGE generators using backup diesel fuel before it was required by regulations. MGE also provided \$200,000 to purchase ultralow sulfur diesel for metro buses in 2005 to reduce particulate and sulfur dioxide emissions.

- Watershed model - MGE provided \$200,000 to help develop a Dane County watershed hydrological model, which helps improve the understanding and management of both underground and surface water resources in the Dane County area.

- Water use mitigation – MGE implemented a comprehensive plan to mitigate water use by the facility.

MGE will continue to work cooperatively with others to comprehensively address air quality issues in Dane County. The complete memorandums of understanding are posted on our Web site.

For more information:

- Visit www.mge.com/about/powerplants/cogen.
- Direct any questions to Bob Stoffs, an MGE community services manager, at rstoifs@mge.com or (608) 252-7906.