

Chapter V. Corporate Energy Efficiency and Renewable Energy

The following facilities in the ARC region are examples of the use of energy efficient processes and renewable energy in corporate settings. These cases highlight innovative implementation of waste reuse and energy saving system design. Some of these examples are Federal facilities that have reduced energy consumption through the Department of Energy's Federal Energy Management Program (FEMP). Others are partners in the DOE's Industrial Technologies Program.

1. Dublin, Virginia - Volvo Trucks

Volvo's New River Valley Plant is the largest Volvo Trucks manufacturing facility in the world and assembles all Volvo trucks sold in North America. This facility also makes electric cabs for Volvo's emerging line of fully electric cabs for long-haul trucks. In recent years, the New River Valley plant has made considerable changes in its industrial processes that have focused on reducing consumption of water, energy and materials, while increasing recycling and minimizing waste material. The facility utilized the Siemens Energy Management Program to reduce energy usage through the automation of lighting and building heating and cooling.



Photo: Volvo Trucks New River Valley Plant

Since 2003, the plant has reduced water consumption by half through recycling and reuse of water used for cab leak testing and in painting. A recycling program and increased sorting of refuse cut landfill waste in half since 2000; the plant currently recycles more

than 75% of the waste it generates. The amount of energy consumed for each truck produced has dropped by more than 60% since 2001, through a comprehensive energy management program. The facility was awarded the 2005 Governor's Environmental Excellence Award for its efforts to reduce emissions. These include replacing all paints and lacquers with lead and chromium-free products.

2. Radford, Virginia - Radford Army Ammunition Plant



Photo: Radford Army Ammunition Plant

This 4,080 acre manufacturing area supplies solvent and solventless propellant and explosives to the U.S. Armed Forces. The facility undertook an energy savings program that emphasized low cost energy conservation initiatives. Much of the savings were due to increased nitrocellulose production, which reduced the magnitude of steam line losses as a percentage of total plant steam. Other projects included installing an oxygen trim for powerhouse boilers, reducing reactive power charges from their utility, and varying steam turbine extraction pressures. The facility's energy saving projects allowed cost savings of more than \$350,000 and 230 billion btu per year.

3. Hagerstown, Maryland – Statton Furniture

Statton Furniture is a manufacturer of quality, hand-crafted cherry furniture. The company has operated since 1926. Since 1973 the company has utilized over 40 percent of its wood waste by using this fuel source to operate a boiler within the company's plant facility. The wood waste used to run the boiler is transferred from the company's wood saws to storage where it is eventually fed to the boiler unit. The unit is currently used to heat the entire plant facility. The plant's utilization of wood waste enables the plant to obtain a 60 percent yield on lumber.²⁰

4. Huntington, West Virginia - Steel of West Virginia

Steel of West Virginia is a supplier of structural beams, channels and special shape steel sections made of recycled steel. The company is one of three mills in the U.S. that uses a laser gauge to photograph steel bars for defects, allowing considerable time saving for that stage of production.

Over the past few years, Steel of West Virginia has spent more than \$60 million to modernize its production process. Due to the energy-intensive nature of the operation, virtually every upgrade was related to energy consumption. Upgrades included a new high-speed reheat furnace, quick-change mill roll stands, installation of finger doors on furnaces and a reduction in the amount of time gas torches were on. As a result of these investments, productivity doubled and the facility has seen annual energy savings of \$1.6 million or more. Current plans include more energy saving improvements, including the elimination of one of two scrap melting furnaces, without reducing capacity.



Photo: Steel of West Virginia

²⁰ Interview with Bill Whittington, plant manager, July 11, 2006.

5. Spartanburg, South Carolina - BMW Manufacturing

BMW manufactures its X5 Sports Activity Vehicle, Z4 Roadster, M Roadster, Z4 Coupe and M Coupe at its Spartanburg facility. The facility gets 53 percent of its energy needs from methane gas from a nearby landfill. A 9.5 mile pipeline from the landfill feeds the gas directly to the facility, where it is used to power BMW's generators and paint shop oven burners. The paint shop is the largest energy user within the BMW facility. The installation has saved BMW over \$1 million in annual energy costs and reduces the company's exposure to volatile natural gas prices.



Photo: BMW Manufacturing

6. Tishomingo, Mississippi – Heil Environmental

Heil Environmental manufactures refuse truck bodies for the garbage collection industry. Following an energy assessment conducted by the Mississippi Development Authority and implementation of recommended upgrades, the company reported annual savings of \$500,000. The savings were a major factor in the decision to keep the facility open and the resulting additional investments made in more efficient equipment and building upgrades.



7. Russell, Kentucky - AK Steel, Ashland Works

AK Steel's Ashland Works produces carbon and ultra-low carbon steel slabs, along with hot dip galvanized and galvanized coated steels. AK Steel recently installed a new briquetting process to recycle and reclaim up to 250,000 tons per year of iron and carbon units, reducing the amount of raw materials that must be purchased. The facility also implemented several conservation and efficiency measures that reduced natural gas consumption per ton by approximately three percent since 2003. These cost savings have helped the facility to remain a player in an increasingly competitive international steel market.



Photo: AK Steel's Ashland Works

8. Uhrichsville, Ohio – Commonwealth Aluminum/Aleris Rolled Products

Commonwealth Aluminum manufactures alloy aluminum sheet from recycled aluminum and aluminum and nonmetallic wiring products. The company's Uhrichsville plant is a continuous-casting mini-mill. Commonwealth Aluminum is a partner with the State of Ohio and the U.S. Department of Energy's Industrial Technologies Program.

Results of the energy assessment identified several upgrades that could save the facility more than \$1 million per year. These included upgrading the melter/holder furnaces, improving the melt stirring process, implementation of best practices for melting and use of infrared imaging technology for process diagnostics. Several of these upgrades would have an immediate payback, while upgrading of the melter was estimated to give a five year payback.

9. Ragland, Alabama - Ragland Clay Company

Ragland Clay Company is a manufacturer of brick and brick paver products. The company has been making extensive modifications and improvements to their plant since 1996. One of the most recent changes is the use of a biomass gasification unit that uses wood chips as fuel. The gasification unit was installed in order to reduce energy costs and to reduce moisture in the bricks themselves leading to a higher quality product. The gasification unit has been in use for less than three months making exact energy savings difficult to measure. However, it is estimated that the new unit will result in an energy savings that will range from \$400 to \$600 per day.

10. Freeland, Pennsylvania – Hazelton St. Joseph Medical Center

This 6,500 sq ft facility is heated and cooled with a geothermal air conditioning system. The system is comprised of two five-ton and one 7.5 ton water-to-air heat pumps. Six 220-foot vertical boreholes deliver constant temperature air via circulating groundwater loops all year round.²¹ This system has caused the center's energy costs to be lower than comparably used smaller sized buildings.



Photo: Hazelton St. Joseph Medical Center

11. Vestal, New York – Kopernik Space Education Center

Installation of a geothermal HVAC system in this 8,000 sq ft building allowed the Roberson Museum and Science Center to expand its astronomical observatory and improve its energy efficiency without having to build a natural gas pipeline to the relatively remote hilltop where the observatory is located. The system includes eight

²¹ <http://www.geoexchange.org/pdf/cs-021.pdf>

circulating tubes drilled 250 deep into granite bedrock. The payback on the system relative in terms of energy savings over a conventional system was about six years.²² This investment was made possible through a grant from the State of New York.



Photo: Kopernik Space Education Center

12. Burnsville, North Carolina – EnergyXchange Renewable Energy Center

This demonstration facility uses landfill gas to fuel a pottery kiln, glass furnace and a regional forestry and horticulture center. The complex also includes a micro-turbine demonstration of electricity generation in partnership with Carolina Power and Light. The project is an example of a combined Federal, State and private partnership.



Photo: EnergyXchange Renewable Energy Center

²² <http://www.geoexchange.org/pdf/cs-066.pdf>

13. Knoxville, Tennessee – Rohm and Haas Company

Rohm and Haas is a specialty chemical manufacturer that provides products to a number of industries including paints, electronics, adhesives and plastics manufacturers. The company is a partner with the U.S. Department of Energy's Office of Industrial Technology energy assessment program. Rohm and Haas's energy assessment identified potential energy savings in steam and electricity use equivalent to \$1.5 million in cost savings. Energy savings implementation as of 2003 included 20 billion btu per year in fuel savings and 1,600 MWh per year in electricity savings. Specific identified energy projects included: optimization of steam system maintenance, recovery of preheated water, optimization of refrigerated water use and flow, and use of a consolidated compressed air management system.²³



Photo: Rohm and Haas' Knoxville, TN plant

14. Rome, Georgia - U.S. Biofuels

U.S. Biofuels makes biodiesel from poultry grease. The company was started in 2003 as a spin-off from the owners' chemical business. The company is in the process of expanding its operations to increase production from 300,000 gallons a month to 800,000 gallons.²⁴

²³ <http://www.nrel.gov/docs/fy04osti/34705.pdf>

²⁴ 6/20/2006, The Atlanta Journal-Constitution, "Biodiesel, Ethanol Hold Big Promise."