All of the energy consumed in the paint shop and almost half of BMW Manufacturing’s total energy requirement is now provided by burning methane gas generated by decomposing waste in a landfill, saving the company at least $1 million per year. With an investment of $2.5 million, and the current high costs of energy, the company expects to see a return on its investment in less than two years.

“The paint department is the largest consumer of energy in any automotive manufacturing plant,” says Dara Leadford, the engineering section manager who managed the Paint Shop conversion. “Fifty percent of our energy is used in the paint department for controlling the process environment that is a necessity for a quality surface finish.”

Development history
On June 20, 2002, BMW Manufacturing first announced that it would burn landfill methane gas in its automotive manufacturing facility. To do so, the company had to construct an unprecedented 9.5-mile pipeline from the landfill to the plant. The system went online February 11, 2003. By utilizing the previously unused energy from landfill gas, BMW was able to reduce area emissions of carbon dioxide by approximately 60,000 tons and recover enough energy to heat 10,000 homes per year.

Then in May 2006, the company announced that it would become the world’s first automotive manufacturer to use recycled methane gas to provide energy to its paint shop. The additional consumption of methane also reduces greenhouse gases the equivalent of driving a car around the globe 4300 times, or more than 100 million miles. The system, which is currently going through testing, will go online in August 2006.

The Palmetto Landfill is capable of supplying 5500 standard cubic feet per minute (SCFM), and BMW
was burning only approximately 4000 SCFM prior to the paint shop expansion.

“The unique thing about this project is that we are using fuel in a way that has never been done before – in production-critical automotive ovens that cure the paint on our vehicles,” says Mr. Leadford. The painting process won’t change, but the paint shop does become more flexible because the facility is not locked into fluctuating natural gas costs.

“The system is designed to be transparent,” continues Mr. Leadford. “It is just a different energy source fueling the curing ovens. There will be no change to the highly controlled and delicate painting process, but it will cost substantially less to operate the paint shop. The same amount of energy is needed whether it comes from natural gas or recycled methane gas.”

In addition, a two-tier backup system ensures minimal risk to production. If the landfill gas supply were to be interrupted, redundant backup/blending systems are in place to support the paint shop ovens with a diluted natural gas flow. Even if all three systems (the main system and two backup systems) were to fail, the paint shop could be powered by pure natural gas in less than an hour.

**Energy partners**

BMW worked with longstanding partner Durr Systems of Plymouth, Mich., to modify and upgrade equipment so that landfill gas could fuel the paint shop. Durr Systems specializes in developing and implementing energy projects in industrial facilities, and is a partner in the Environmental Protections Agency’s Landfill Methane Outreach Program, which helps businesses reduce operating costs, protect the environment, and build a sustainable future.

Two other important partners in this multi-million dollar project were Ameresco Energy Services and Waste Management Inc. Ameresco designed, built, and owns the pipeline, gas processing, and gas compression facilities, and also manages the overall operation of the project. Waste Management, which owns and operates the Palmetto Landfill, currently supplies landfill gas to 69 gas-to-energy projects in 21 states. BMW is a charter member of the EPA’s National Environmental Performance Track, which recognizes companies for their environmental stewardship and performance. The company is also a member of the South Carolina Environmental Excellence Program.

“We have received a tremendous amount of interest in how we made this project a reality,” says Briggs Hamilton, BMW Environmental Manager. “We’re eager to share the knowledge we’ve gained – we’re not in competition with anyone on improving the environment.”

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