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Villanova to test energy-conserving fume hoods in laboratories

By Diane Mastrull

Inquirer Staff Writer

Consider this costly paradox confronting the Philadelphia region: Inside laboratories at the numerous colleges, teaching hospitals, pharmaceutical plants, and biotechnology companies here, researchers toil daily to find solutions to problems - while significantly adding to one.

Their work stations are energy hogs. Especially gluttonous is the fume hood, a device critical to protecting the health and safety of lab workers as they mix chemicals and study reactions.

Functioning much like a stove's exhaust fan, a fume hood sucks out the bad air around researchers' beakers and flasks. Unlike the kitchen fan, it's a major energy draw, with each hood adding \$10,000 to \$12,000 to an institution's electric bill in a year.

Ventilation contractors estimate that there are thousands installed in this region, and 1.2 million nationwide.

There's no getting around the need for fume hoods. But a New Jersey

engineer said he believed he has the answer to cutting their energy consumption and, in the process, putting idled sheet-metal workers, plumbers, ventilation experts, and electricians back to work.

With the help of local contractors, that engineer, Robert Morris, president and chief executive officer of Flow Safe Inc., of Morris County, has persuaded Villanova University to serve as a test site for his fume hood retrofit kits.

The kits include sliding doors that help protect the user and limit the escape of air. Overall, the retrofit makes it possible to cut in half the amount of air exhausted from a lab area, thus reducing half the amount of fresh air that has to be pulled into the lab and treated (heated or cooled, that is).

The hope is that the results at Villanova will trigger a conversion epidemic across this laboratory-laden area.

"There is tremendous potential," said Bill Reardon, executive director of the Sheet Metal Contractors Association of Philadelphia and Vicinity, which represents companies that employ members of Sheet Metal Workers Local 19. "There are easily thousands, probably tens of thousands, of these hoods in the Delaware Valley."

A partnership of employers and employees in the heating-ventilation-air-conditioning industry known as the Sheet Metal Industry Advancement Committee provided Villanova with three retrofit kits, which cost about \$8,000 each, and the labor to install them.

The work was done last month in Room 310 of the university's science center, Mendel Hall. Under the protection of those fume hoods, faculty members conduct research relating to synthetic chemistry involving organic and metallic materials.

If the new hoods wind up cutting energy bills sufficiently without sacrificing air quality, it could mean the eventual replacement of the other 144 hoods in Mendel Hall, said Robert H. Morro, associate vice president for facilities management.

Mendel is one of the biggest power users of the 75 buildings on

campus, he said, consuming "two to three buildings' worth" of energy.

At \$8,000 a hood, the retrofits probably would not happen all at once, Morro was quick to add. The cost is only about one-fourth the price of buying new energy-efficient fume hoods and having them installed by union labor, contractors said.

The energy savings resulting from the retrofits should enable a return on investment within two years, Morris said.

In today's cost-pressed business world, every expense is under scrutiny - especially if it relates to energy. And electric-rate caps in the Philadelphia market are set to expire at the end of the year, with price increases of about 10 percent expected.

Still, capitalizing on the green fervor that has companies installing photovoltaic systems, low-flow toilets, and motion-activated light switches to reduce their carbon footprint is not what motivated Morris to develop his fume hood kits.

He just wanted to help keep those who work with chemicals safe. His inspiration was his twin brother, an art professor who taught photography at a university Morris would not identify. He said his brother, now 65, became seriously ill about 20 years ago working with photo-processing products in an inadequately ventilated university lab.

Morris said he invented his retrofit kits in the 1990s, but the hood-manufacturing industry was not interested in what he was selling.

"It would be like telling the tobacco industry, 'Do you know your cigarettes cause cancer?' " Morris said.

The idea did not get any traction until about six years ago, when he started talking up the energy-saving attributes of his hoods, rather than just their safety features.

"Nobody could care . . . until I told them you could save \$5,000 or \$6,000 a year on energy," Morris said.

Yet one of the biggest obstacles to widespread conversions, he said, is

the financial constraints that businesses are working under, which limit the money available for infrastructure improvements.

He is aware of just one utility company, in New England, that is willing to pay up to 60 percent of the cost of a hood retrofit.

At Peco Energy Co., spokeswoman Cathy Engel said energy-efficient fume hoods could qualify as a "custom measure" under the utility's Smart Equipment Incentives, providing they meet all program and technical requirements.

The program is part of Peco's response to Pennsylvania's Act 129, legislation requiring all state electric utilities to develop programs to help customers reduce energy use by 1 percent by May 31, 2011, and 3 percent by May 31, 2013.

Now that Morris has established that the fume hoods can be an energy-saver, he has moved on to another selling point: job creation.

That is definitely Joe Sellers' priority. He is president and business manager of Sheet Metal Workers Local 19, which has 4,500 members, many of them unemployed.

Retrofitting fume hoods would "give them the opportunity to get back to work while meeting the needs of energy-cost reductions, as well as global environmental needs," Sellers said.

Contact staff writer Diane Mastrull at 215-854-2466 or dmastrull@phillynews.com.

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