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## **Qualified Energy Savings helping budget, environment**

Three buildings on the West Lafayette campus have been selected for Qualified Energy Savings (QES) upgrades as the state program resumes.

Improving campus energy efficiency is a key part of Purdue's stewardship initiatives, but how to pay for it has been an ongoing challenge.

Purdue was the state's leading user of QES opportunities before budget shortfalls shelved the program early this decade.

By QES legislation, Purdue can borrow up to \$10 million to retrofit existing facilities. The projects are designed to pay for themselves in 10 years or less from the energy and operational savings. As the University realizes the financial savings from these upgrades, the loans are paid back, and more funds can be borrowed.

The Board of Trustees has approved QES projects for Brown Laboratory of Chemistry, Stewart Center, and the Civil Engineering Building, to begin this summer. The budget for this QES project totals just over \$4.5 million. Average annual energy savings of approximately \$580,000 are anticipated, for a project payback of less than eight years.

In addition, the energy savings from these projects translates to a 3.3 percent annual reduction in overall carbon dioxide emissions from Wade Utility Plant. This reduction is equivalent to taking 3,583 cars off the road each year, if each were getting 25 mpg and traveling 10,000 miles per year.

The QES projects at Brown, Stewart, and Civil will focus on replacing outdated air handling units and inefficient water fixtures, and upgrading indirect digital controls.

Purdue's QES efforts will:

- \* Help reduce the deferred maintenance backlog.
- \* Serve as a vehicle to make capital replacements, such as replacing old air handlers with more efficient models.

- \* Make these buildings more energy efficient, which in turn places less demand for energy from the power plant.

- \* Help provide increased comfort to campus customers. Project manager Rustin Meister says, "I am very excited about this project. This is really a great opportunity to provide energy-efficient systems that will provide positive outcomes for both the University and the building occupants -- a win-win for everyone."

The contractor, Energy Systems Group, has planned a comprehensive package of energy conservation measures. Proposed ECMs at all three buildings include water conservation, replacing 3.5 gallons per flush (gpf) toilets with more efficient 1.6 gpf toilets, replacing 1.7 gpf urinals with 0.61 gpf models, and retrofitting kitchen and lavatory faucets with aerators to reduce water consumption.

Additional upgrades include:

- \* At Brown, building-wide mechanical and controls upgrades, to optimize the amount of air required by the fume hoods in labs, while maintaining a safe operating environment for the occupants.

- \* At Civil, repair and retro-commissioning of 11 air handling units to reduce air flow during off-peak periods to reduce energy use, as well as installation of new automated controls network.

- \* At Stewart, installation of variable frequency drives on 15 large-volume air handling units to reduce airflow during off-peak loads, thus reducing fan energy and re-heat costs. Upgrade of controls system for greater efficiency and improved building conditioning.

Also at Stewart, installation of carbon dioxide sensors and new fans to regulate outside air and control associated building exhausts to reduce outside air heating and cooling loads.

Previous QES projects have been performed in Brown, Stewart, and Lilly Hall of Life Sciences, on regional campuses at Fort Wayne and North Central, and throughout the West Lafayette academic campus to replace lighting fixtures and sensors.

Energy-efficiency efforts have continued in recent years by adding campus-wide metering and improvements at the power plant, among other things.