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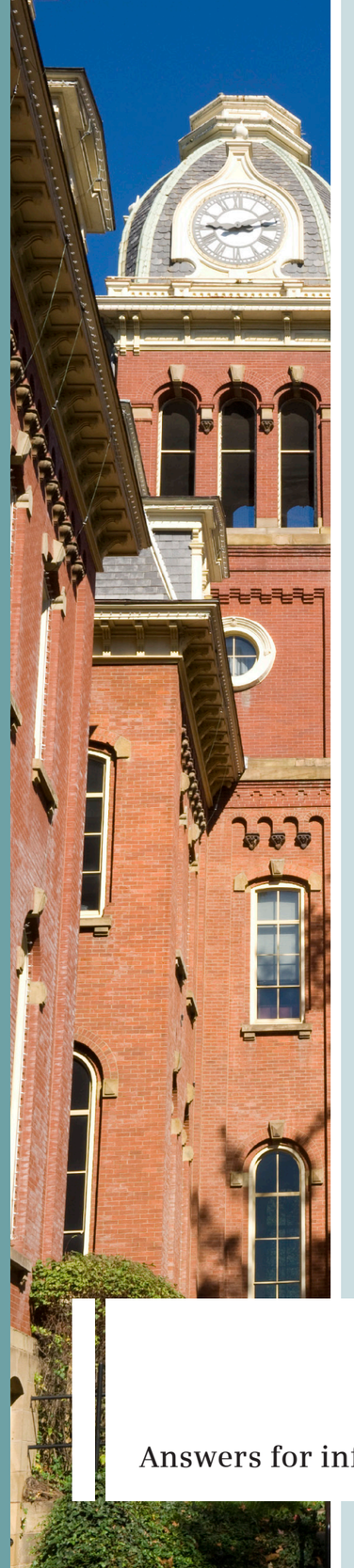

Performance Contracting: A Budget-Neutral Solution to Increase Efficiency

An in-depth examination of the projects and procurement process of West Virginia University's performance contract

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It's a familiar story: a university with facilities in need of improvement, outdated and inefficient building systems and more projects than money to complete them. Ten years ago, this was the situation at West Virginia University (WVU). Today, the Morgantown, WV-based institution is in the middle of a multi-phase project to improve campus facilities and upgrade building systems, increasing energy efficiency and conserving water across much of the eight million-square-foot WVU real estate portfolio.

Before work commenced in December 2007, there was a backlog of deferred maintenance at the university's five regional campuses. Many of the facilities built in the 1960s and 1970s were still operating with original equipment and limited centralized building automation systems. "We were keeping a lot of the stuff running, but it wasn't running very well," says Joe Fisher, Associate Vice President, Facilities and Services, West Virginia University. The potential to improve efficiency was great. However, with so many competing needs for available capital, money was tight. When West Virginia reduced its funding for state institutions, WVU was faced with a $9 million shortfall, exacerbating the situation.

The university was eager to find a way to cut utility costs, improve facility operations, address deferred maintenance and lessen the impact of campus buildings on the environment. A performance contract with Buffalo Grove, IL-based Siemens Industry, Inc., Building Technologies Division is making it possible. With hundreds of projects completed or underway and more on the docket, the grand total for the work is expected to be more than $50 million. When all the projects are completed, WVU will save just as much – or more – than it is spending.

Due Diligence

In August 2003, the state of West Virginia passed legislation (WV Code 5A-3B-1 and 5A-3B-2) that allowed state entities to enter into performance-based contracts. Before WVU began its search for an energy services company (ESCO), the institution had to overcome its skepticism, though. "We wanted to avoid some of the failures that had given performance contracting a bad name," says Fisher. The university's facilities and procurement departments partnered together and began researching what makes a performance contract successful. They started by contacting institutions that had financed capital projects via performance contracting in the neighboring state of Pennsylvania. The goal was to learn from their experiences, avoid pitfalls and apply best practices. The exercise proved valuable. What the team learned from other institutions helped set expectations early on. Several parameters, including the following, were disclosed in the request for proposal (RFP).

- Energy savings during the construction period of the contract are not allowed.
- In each phase of the contract, equipment has to be bid by the vendor.
- Operational savings will not be considered.
- Open-book pricing is a requirement.
- WVU will provide full approval for all submittals, materials and subcontractors.

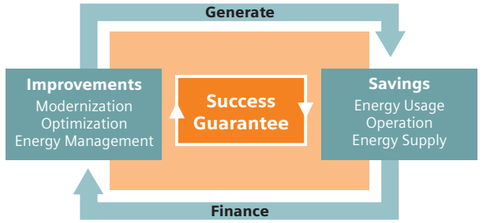
The university was looking for a partner, not to relinquish all control over its facilities. The team also wanted transparency with regard to costs and reporting. Open-book pricing enabled WVU to verify the cost of each piece of equipment being installed and offered some cost protection. Prohibiting the inclusion of operational savings meant
that ESCOs could only predict savings based on reduced kilowatt-hours, BTUs of energy, etc. "Operational savings is basically the man-hours that you're saving because you're putting new equipment in that won't have to be monitored and maintained. Unless you're willing to fire your employees, there is no such thing as operational savings," explains Lisa Saurborn, Engineering Manager, Facilities Management, WVU.

The Request for Proposal

The university sent the RFP out to bid in January 2005; 18 companies responded. If their research taught the WVU team anything, it was how important selecting the right ESCO was. "When the right parties and players are in the game, this is a viable solution," says Clement Solomon, WVU's Director of Sustainability for Facilities and Services. The companies submitting proposals were evaluated based on capabilities, years in the marketplace and previous experience with performance contracting. Six companies had acceptable qualifications. After interviews and oral presentations, the field was narrowed to three finalists. Each company was asked to perform an investment-grade energy audit at its own expense. The assessments would analyze consumption and identify areas where WVU could maximize energy savings.

The audits were evaluated by two different groups of individuals at WVU. One group judged companies' technical expertise and capabilities; the other examined the audits for fair pricing. These two aspects were weighed separately (55-percent for technical merit and 45-percent for costs) to ensure that the company WVU contracted with would provide knowledge and quality work at a reasonable price. Siemens came out as the frontrunner. The company has 15 years of performance-based experience, has completed more than 1,300 successful projects, and has saved $3 billion in energy costs for its customers. By the time the selection was made, WVU had invested nearly two years in the contract procurement process. "Our folks did a very good job on the upfront discussions, setting expectations and making sure they followed through and got what they wanted, rather than just signing a piece of paper and everybody's confused at the end of the day," notes Solomon.

Once selected, Siemens recommended facility improvement measures (FIMs) that would deliver the most impact. The cost and predicted savings that would result from each project's implementation were shared. WVU evaluated the needs and wants of campus facilities, urgency of repairs and upgrades and balanced payback periods to select the right combination of projects for Phase I. "It was a mix of projects with greatly varying payback periods," says Fisher. Projects with quick payback like power factor correction offset projects with longer payback or even training which offered no payback at all.



The Contract

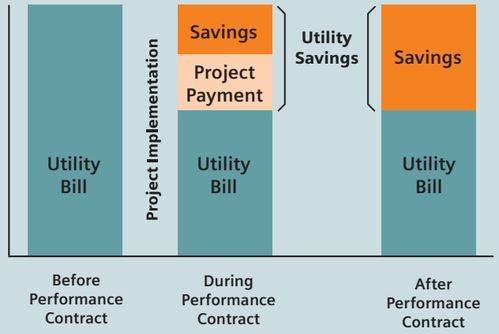
Instead of using a standardized contract, WVU elected to customize its own. This process required consultation with lawyers, countless meetings and negotiation between Siemens and WVU until both parties were happy with the contract language. Central to the discussion was establishing measurement and verification methods for each FIM and negotiating profit margins. "We negotiated and settled on a percent markup to include for their costs for being the general contractor, their costs for engineering, costs for their overhead, costs for their profit and also the cost that was associated with the guarantee, because there *is* a cost with that," explains Saurborn.

Performance Contracting Defined

Performance contracting is a means of financing a multi-faceted capital improvement project. An energy services company (ESCO) identifies facility improvement measures (FIMs) that will reduce water, sewage, electricity, steam, natural gas, etc. and guarantees the predicted savings. The ESCO provides single-source accountability, acting as project manager, executing the work and/or hiring local contractors.

The contractee gets a loan to pay for the improvements. The cost of the project is divided by the guaranteed annual savings to determine the length of the contract. Project payment is based on the guaranteed annual savings. Once the project is implemented, the savings resulting from increased efficiencies are used to make loan payments to the capital leasing company. If the actual savings are in excess of the guaranteed savings, the contractee keeps the amount above the guarantee. If they are lower, the ESCO must pay the contractee the difference. Beyond the term of the contract, the contractee receives the entire energy savings.

How Performance Contracting Works



The agreement was written as an open-end contract. This provided flexibility for the university to complete the project in stages. In an open-end contract, the original terms and conditions of the contract apply to each phase. "With the amount of equipment that we're dealing with, there was no way I could do the whole campus at once. [This type of contract] lets us break the campus up and do each phase as a separate purchase order underneath the larger open-end contract," says Saurborn.

Subsequent phases have to be approved by WVU's Board of Governors. If the university was not satisfied with Siemens' performance during Phase I, the purchase order for additional phases would be denied. "The fact that we're in Phase III is evidence of our satisfaction," says Tim Bostonia, Associate Director for WVU's Purchasing, Contracts, and Payment Services Department.

Implementing FIMs

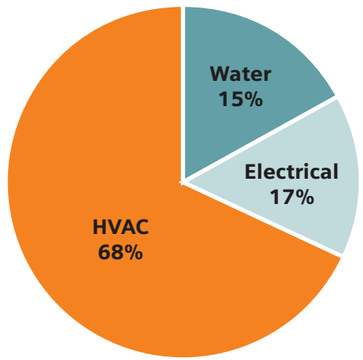
Known for its building automation systems, Siemens provided a wealth of knowledge and capabilities when specifying and installing new controls at WVU facilities. Local contractors were hired to complete other projects. Jim Platz, senior account executive at Siemens, explains: "We used companies that they were already working with that could save them money on installation because they knew where those buildings were, they knew the problems and they knew their processes."

Unlike a typical construction project, which is often plagued by constant change orders and finger-pointing, performance contracting provides single-source accountability. "The advantage of PC projects is you only have one vendor you're dealing with, so if it doesn't work, you go straight back to them. They're responsible for purchasing, installation, the whole nine yards, so it makes it very easy to manage," says Saurborn.

Each phase of the contract addresses projects both big and small at a specific group of campus facilities. The projects include everything from installing a new chiller to insulating pipes. The installation of new equipment and retrofit of electrical, plumbing and HVAC systems will dramatically reduce WVU's energy, water, sewage and steam bills.

New energy management systems in some facilities and modifications to building controls in others will improve the information and efficiency of building operations long after the performance contract expires. "$2 to $3

Phase I Savings Categories



million worth of controls upgrades in the first and second phases will not only help their buildings operate more efficiently, but improve comfort levels. We're putting in more sensors and controls to help even out temperature variances in buildings. Remote monitoring is another new capability," explains Platz.

Project Phases

The list of facility and infrastructure improvements in each phase is substantial. In Phase I alone, approximately 90 improvements were made to 10 buildings on the Morgantown campus. Topping the list were lighting controls and the retrofit of T12 lamps and fixtures. Additional projects included water conservation measures, weatherization, and installation of steam traps and power metering.

Phase I addressed nearly 1 million square feet and cost $8 million. Siemens guaranteed WVU annual savings of $745,000. After 15 months of construction, the realized savings from year one totaled $906,374. Since the actual savings were in excess of the guaranteed savings, the institution keeps approximately $164,004, the amount above the guarantee. "The actual performance is beyond expectations," says Bostonia. "Not only is it beyond expectations, it's beyond contractual requirement." From February 2008 to January 2009, WVU achieved the following usage savings:

- More than 10 million kilowatt-hours of electricity.
- More than 14,000 kilowatts of power.
- More than 32 million pounds of steam.
- More than 31 million gallons of water.

The cost of Phase II is even greater, as are the guaranteed savings. With facility improvement measures at three campus locations, the installed project costs total $12.5 million. Construction will be complete in April 30th of 2010. The guaranteed annual energy savings from projects at the Evansdale, Parkersburg and WVU Institute of Technology campuses is approximately $1.1 million.

Phase III will address the institution's Health Sciences campus, cost $6.8 million and provide guaranteed annual savings of more than $586,311. The WVU Board of Governors discussed and approved Phase III of the performance contract during its meeting on Feb. 5, 2010. Phase IV investment-grade energy audits for the 16 buildings are expected to begin in 2012. Phase V will encompass the remainder of the downtown campus.

Measurement & Verification

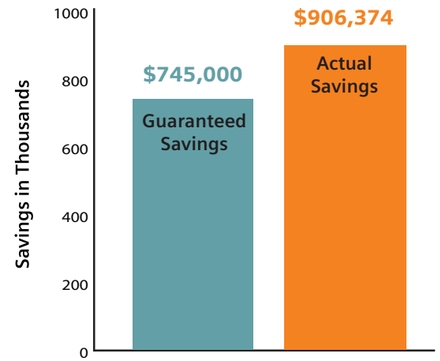
As soon as construction concludes on each phase, the annual guaranteed performance appraisals begin. Solid measurement practices and the ability to verify guaranteed savings is critical. WVU did not leave anything up to chance and consulted with Buffalo, NY-based C.J. Brown Energy, P.C. to establish which methodology for measurement and verification was appropriate for every FIM. With the three parties around a table, a measurement and verification plan was drafted and is detailed in the contract.

WVU looked to the International Performance Measurement & Verification Protocol (IPMVP) as its guide. Procedures, with varying levels of accuracy and cost, are outlined for measuring and/or verifying baseline and project installation conditions and long-term energy savings. Three of the four options in the IPMVP were used at WVU.

1. Measured Capacity (Option A)
2. Measured Consumption (Option B)
3. Calibrated Simulation (Option D)

Option A, Partially Measured Retrofit Isolation, is being used to verify projects like lighting retrofits. Representative measurements are taken before and after the installation and compared. "I don't measure every bulb, but I take a sample of each type of fixture so that we know what our measured savings are before and after," explains Saurborn.

Phase I Guaranteed & Actual Savings for Year One



Savings from variable frequency drives (VFDs) are being verified with Option B, Retrofit Isolation. Tied into the building management system, the actual amperage is recorded and compared to readings from before the installation of a VFD. Continuous measurements are taken following the installation.

Option D, Calibrated Simulation, relies on calculations to adequately model energy performance in a facility. This method is rarely used at WVU, with the exception of low-flow toilets because the equation is fairly simple.

A fourth IPMVP methodology called Whole Facility is not being used. Option C examines energy use of the entire facility to track savings. "I do no utility-billing comparison whatsoever because my utility bills are all consolidated. I've got 50 to 60 buildings going into three electric bills," explains Saurborn.

Establishing acceptable methodologies for measurement and verification was important for three reasons: it prescribed a consistent process at the program's onset, helped WVU secure financing and made it easier to sell performance contracting to administrators. "We went into this knowing how we were going to verify every cost-saving measure. We were very confident that what was predicted would be achieved," says Fisher.

Meeting Goals

The performance contracting program underway at WVU is beneficial to the institution for a number of reasons. Chief among those is the improved efficiency, comfort and operation of campus facilities. “It also helps with safety,” adds Saurborn. Installing monitors on fume hoods to ensure that they are exhausting properly is just one example.

Instead of upgrading outdated, inefficient equipment and commissioning building systems gradually over the course of many years, the work is happening now. “We saw that it would be many years before we would get around to renovating and modernizing these buildings, and consequently we would just be wasting energy all that time,” notes Fisher. Thanks to the performance contract with Siemens, deferred maintenance is being addressed and both building systems and training are helping staff become more effective.

Financial benefits to the university are just as significant. This budget-neutral process reduces unexpected and emergency capital expenditures and controls future utility expenses for the institution. “We’ve been able to flatline our utility budget to a great extent because of these contracts,” says Bostonia.

Students, staff and faculty and the institution’s finances will all benefit, as will the environment. WVU is committed to incorporating and integrating sustainability into every aspect of its overall mission; the performance contracting program is one example of how the institution is working to lessen its impact on the environment. “When you don’t burn a cubic foot of gas, don’t use a gallon of water and don’t burn a kilowatt of electricity, you’re not only reducing your cost, you are contributing to the sustainability of the environment as well,” says Bostonia.

Environmental Impact of Phase I

As the savings increase, the size of WVU’s carbon footprint shrinks. Annual emissions reductions for Phase I equate to:

- 80 acres of trees preserved from deforestation.
- 2,000 cars removed from the road for one year.

The environmental impact of Phase II is equal to eliminating the pollution of another 1,687 cars per year or 65 acres of forest preserved from deforestation.

WVU’s partnership with Siemens is helping the institution provide the highest quality educational experience to students, operate facilities with fiscal responsibility and minimize the impact of more than 80 campus buildings on the environment. With emissions reduced, utility bills shrinking and buildings operating better than ever, the performance contracting program is being hailed as a real success.