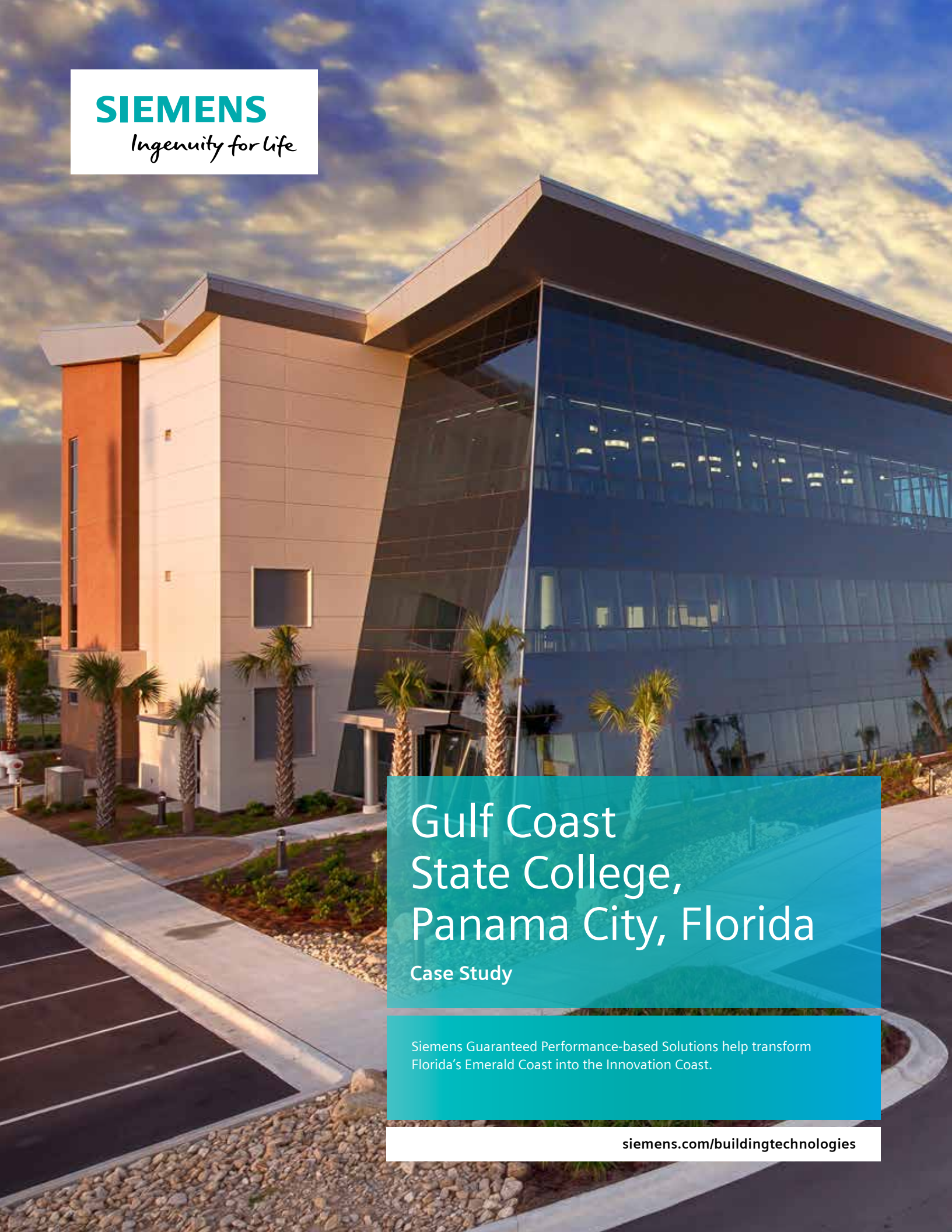

SIEMENS

Ingenuity for life

Gulf Coast State College, Panama City, Florida

Case Study

Siemens Guaranteed Performance-based Solutions help transform Florida's Emerald Coast into the Innovation Coast.

siemens.com/buildingtechnologies

Energy-efficiency upgrades and retrofits at Gulf Coast State College are estimated to save $3.3M over 20 years.

By proactively tackling rising energy costs and greatly reducing their carbon footprint, Gulf Coast State College is now at the forefront of sustainability in the state of Florida.

Located in Panama City, Gulf Coast State College was the first public two-year institution to open after the 1957 Florida Legislature established a statewide network of community colleges. The college is committed to delivering life changing learning opportunities and developing the next generation of talent while being equally dedicated to the cultural and economic development of the region.

Client Objectives

Shifting employment trends and anticipated workforce demand for postsecondary degrees with training and skills in Science, Technology, Engineering and Mathematics (STEM) programs prompted administrative leaders at Gulf Coast State College to implement some key infrastructure and building expansion plans.

At the top of the list was the need for an innovation and creative hub, an Advanced Technology Center (ATC), which would better prepare students through hands-on training and state-of-the-art technology. This, in turn, would garner the attention of local entrepreneurs and incentivize industry to relocate to the Florida Panhandle region. Plans for the technology hub came to a standstill, however, when designs for the new facility proved to be cost prohibitive, forcing a dramatically scaled-down version of the ATC. The square footage was reduced and equipment purchases were postponed to avoid further loss of programs, and the water-cooled chiller plant was value-engineered (VE) to a less efficient air-cooled system. It was this VE item that caught the attention of Siemens engineers, knowing the resulting system would be cheaper up front, but cost the college more money in the long run to operate.

The stand-alone chiller plant had been designed because the aged existing central chiller plant already had capacity issues. All ten of the central plant's pumps were pushed at full throttle and yet there were several areas that could not be cooled sufficiently.

The high volume of complaint calls from faculty and students constantly sidetracked the facilities maintenance team from other projects. Siemens engineers believed it was possible that their Demand Flow® chiller optimization solution might solve the college's problem and help them avoid the inefficient separate chiller plant.

Other key facility improvement goals for the college included tackling rising energy costs and reducing their carbon footprint. As an Energy Service Company (ESCO) prequalified by the Florida Department of Management Services, the local Building Performance and Sustainability division of Siemens Industry, Inc., had been working with the college for several years and recommended a Siemens-guaranteed Performance Contract to finance infrastructure improvements. A performance contract funds a project over the life of the contract by guaranteeing the energy savings realized from the improvements. The Siemens proposal would help facilitate over $2.6M of facility improvements. As part of the contract, Siemens would guarantee energy savings of over $380,000 a year as a result of the implemented energy and water efficiency measures. This would allow the college to meet its goals while generating the funds needed to continually improve upon each upgrade. An audit of the campus' building systems established a roadmap of facility improvement measures (FIMs). Siemens began implementing the FIMs on April 15, 2013.

Siemens Solutions

Siemens engineers proposed the Siemens Demand Flow® technology, a unique energy optimization application for water-cooled central chiller plants. This solution would expand the capacity of the existing plant so it could also serve the new ATC building and accommodate future buildings, as well. This also resulted in a **cost avoidance of $1.5M on the ATC Project.**

Funding for the additional 1,400 feet of piping needed to connect the ATC to the central plant would come from the performance contract. The Siemens team estimated an approximately 24% reduction in energy consumption of the central plant and about a 45% lower energy consumption than the proposed standalone, air-cooled plant. One of the college's existing chillers was replaced with a quieter, magnetic-bearing, high-efficiency unit. Controls were upgraded to communicate with the Demand Flow application and integrated, along with all of the other buildings, into the Siemens APOGEE® Building Automation System (BAS). The BAS' front-end system was also upgraded to establish a single point of control and remote access through smartphones and tablets.

Replacing 15-year and older technologies with high-efficiency equipment and control systems drastically improved reliability, lowered maintenance, increased property value, and maximized energy efficiency. Upgrades around campus included:

- Optimizing the hot water plant and replacing an electric water heater/storage unit with a natural gas unit
- Retrofitting constant volume (CV) air handling units to variable air volume (VAV) air handling units
- Programming controls to perform unoccupied period "temperature setbacks" and time-of-day HVAC equipment scheduling
- Installing humidity sensors in every facility to automatically override an unoccupied mode during periods of excessive humidity
- Replacing inefficient water fixtures with low-flow fixtures
- Upgrading old, metal halide lighting to a T5 fluorescent system in the gymnasium
- Utilizing meters in every building to monitor, measure, control, and manage individual facility energy performance

Siemens included a "green" touchscreen to engage students and visitors in the lobby of the ATC. The touchscreen provides up-to-date information on how the ATC building is performing, including electricity, gas, hot water, chilled water, solar PV panels, and wind turbine data. The touchscreen is a key educational stop on the many K-12 tours and field trips hosted by the college.

Client Results

"It's nice to be able to do something that makes sense financially, yet at the same time provides comfort to our students, faculty, and staff," said Gulf Coast State College Vice President of Administration & Finance John Mercer. "With the improved systems in all of our buildings, complaint calls have dropped significantly."

The LEED-certified, 100,000 square foot ATC opened in August 2013 and has renewed excitement along the Gulf Coast and impressed businesses from outside the area. "Bigger technology companies are contacting us to learn more about the benefits of coming into this area," Mercer reported.

The refurbished central plant now only runs two pumps and Facilities Maintenance Supervisor Arnold Varner stated, "Demand Flow is working like a charm. Thanks to the recommendation by Siemens, we are only running at about 15% and have the ability to drop the temperature in a snap. We also have the peace-of-mind of system redundancy, so now the facilities maintenance team can shut the chiller down whenever necessary to work on preventative maintenance."

"Life is a lot easier with the new controls and equipment," said HVAC Technician Jim McDougall. "There are no issues with cooling the buildings like before, and we aren't even close to running at full capacity. Siemens has made the building operation systems run faster, which allows us to see issues quicker. We can proactively eliminate energy waste that in the past would have been undetected. Whereas we used to send one person to the field while one stayed at the desk to troubleshoot and diagnose issues, today we use remote access, which saves us so much time."

Low-flow plumbing fixtures facilitated a dramatic reduction in both the water and electrical utility bills and prompted on-site inspections for faulty meters from both utilities. The performance contract estimated an approximate annual savings of $380,000, however, measurements calculated during the third year of the contract revealed a utility cost savings of **$471,643**. The savings exceeded the contractual guarantee by **$75,597 or 19%**. The college will be able to reinvest these dollars into their infrastructure.

The implemented facility improvement measures also reduced the release of polluting emissions into the atmosphere by 41%. This is equivalent to decreasing greenhouse gas emissions by taking 688 cars off the road for a year.

CONTRACT HIGHLIGHTS

Contract Amount	$2.6 Million
Guaranteed Annual Energy and Water Savings per Year	**$388,099**
Actual Year 1 Energy and Water Savings	**$454,762**
Actual Year 2 Energy and Water Savings	**$469,294**
Actual Year 3 Energy and Water Savings	**$471,643**
Actual Year 1 Electric Consumption Reduction	**2,570,791 kWh**
Actual Year 2 Electric Consumption Reduction	**2,654,539 kWh**
Actual Year 3 Electric Consumption Reduction	**2,490,526 kWh**
ESTIMATED 20-YEAR NET SAVINGS (after repayment of investment)	**$3.3 Million**

By proactively tackling rising energy costs and greatly reducing their carbon footprint, Gulf Coast State College is now at the forefront of sustainability in the state of Florida. The college's campus has been transformed with the addition of the ATC. The college is gaining national recognition for bridging the gap between the needs of the workforce and student skills as well as serving as an incubator for bringing entrepreneurial ideas to market. The partnership between the college and Siemens team will continue to look for additional energy saving opportunities to further minimize energy and operating costs to ensure the best possible outcomes for the institution.

Siemens Industry, Inc.
Building Technologies Division
1000 Deerfield Parkway
Buffalo Grove, IL 60089-4513
Tel. 847-215-1000

(03/2017, Part #153-SBT-270)