

# A Complex Decision, Simplified

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There's a connectedness to a building that most users find nearly impossible to detect. Site, materials, square footage, occupancy and hours of use are just a few factors that play into a building's life cycle and efficiency.

And of course, there are heating and cooling systems, which play a crucial role in comfort and performance. Iowa's Commercial New Construction (CNC) Program includes early analysis of potential HVAC system options as part of its Track IV (Custom Plus). This analysis is helpful for owners and design professionals alike. The CNC Program is funded through the energy-efficiency programs of Alliant Energy, Black Hills Energy and MidAmerican Energy Company, and is available to utility customers. "Many times owners initially believe that one system has a higher cost than another. Early HVAC analysis can help shift their thinking," says Jason Steinbock, The Weidt Group, a CNC Program administrator.

## BENEFITS OF COMPARATIVE ANALYSIS

The free early HVAC analysis reviews up to four different HVAC systems: one that the owner might be considering, one that might not be as likely, one they might have thought about for the future and one with an educational component. Although these four are a suggested approach, the study may be customized according to the team's interests. "The HVAC study is a comparative analysis that can look at different heating and cooling systems for different parts of the building and consider many variables. This information assists the design team in determining the optimal system," says Steinbock. "Even if the end decision is to install the original system they were considering, the team has the comparative data and incentive information to support their direction."

It isn't just the initial cost of the HVAC system that the

CNC Program evaluates. It also looks at the maintenance and replacement part costs as well as expected utility bills; all of those results help to answer different questions by different people with an interest in a building's performance, says Steinbock.



What the CNC Program does first is a comparative analysis that provides objective information. "It really does allow people to look at systems they might not have otherwise considered," says Steinbock. "They may not have had the time or resources to do the analysis, and this allows for a more open discussion. It's helpful for the design team and building owners to have more information."



**PROJECT:**  
**Cedar Hall (Academic Building), Kirkwood Community College**

Build long-term but adapt to short-term needs: That’s the conundrum in which institutions of higher learning often find themselves. In the near future, they may find certain degree programs or classes maxed out. Decades out, they may have to respond to population shifts or new technologies. Even so, pressing needs such as sustainability and building utility costs, including HVAC operation, are very much on the minds of these cost-conscious facilities.

To address those multiple and sometimes competing needs head-on, Kirkwood Community College utilized the CNC Program from the beginning of its plans for the new Academic Building, later renamed Cedar Hall. “Our main goal is always to build long-term, sustainable facilities and use technologies that generally pay off in 10 years or less,” says Tom Kaldenberg, associate VP, Facilities and Security with the college. “All of our buildings are designed with a 40-year-plus life expectancy, and we understand that we need to manage utility costs well into the future.”

Cedar Hall, built in 2008 and 2009 on the east side of the main campus in Cedar Rapids, replaced several temporary buildings and helped alleviate overcrowding from student population growth and as well as provided updated educational facilities. While the college was familiar enough with the benefits of advanced technologies such as geothermal energy and occupancy sensors, the CNC analysis allowed them to better understand insulation, curtain wall and other architectural options that would impact building performance.

Even with its familiarity with the process, two aspects of the CNC analysis pleasantly surprised the college: the large utility rebate for its efforts and the relatively short payback for the systems installed—about six years. For higher education in particular—with buildings in use sometimes 100 years after their construction—the CNC Program helps to thoroughly contemplate the full impact of construction. “Understanding the long-term operational costs for our buildings is a critical piece to managing the budget for the college,” says Kaldenberg.



**PROJECT:**  
**Iowa Football Complex**

When it comes to green-focused construction and building operation, you’ll find few universities across the country as forward-thinking as The University of Iowa. There, LEED Silver is the minimum standard and most newly constructed buildings have reached Gold or Platinum. In addition, all new buildings must achieve at least 30 percent energy savings over the ASHRAE 90.1 standard, says Liz Christiansen, director of the Office of Sustainability. In fact, the university has committed to using less energy on campus in 2020 than was used in 2010, despite continued growth of the campus. “This is the first of seven ambitious 2020 sustainability targets,” says Christiansen.

Although the Iowa Football Complex was phased into two separate projects, for the purposes of energy evaluation it is considered one building. The first phase, the Indoor Practice Facility, is currently operational. The second phase, the Football Operations Center, includes 76,000 square feet and is next on the schedule for completion.

The CNC Program is a source of familiarity to the university: It has been involved with the program since 2000 and all new buildings and major renovations use the program. When it came to the Iowa Football Complex, the university set a goal of achieving the minimum target of 40 percent savings required for Track IV (Custom Plus)—but it would not be without its difficulties. The football project was also unique because where it was being built did not have steam distribution from the campus utilities close-by; this location required exploring different HVAC systems. The university examined various heating systems but decided upon use of heat recovery chillers that employ the heat produced by the condensing process to produce hot water for a radiant floor system. The chilled water is used for cooling of the building, and excess could go into the nearby university chilled water distribution system.

The project was actually the first time The University of Iowa utilized Track IV (Custom Plus)—and it has since been used in a number of new buildings. “To build an energy-efficient and sustainable building, it is important that the design team and owner have detailed energy-efficiency goals,” says Christiansen. “When a college or university builds a building, it will be operating for a long time, and therefore energy efficiency and sustainability should be an important element in design decisions. The University of Iowa’s energy-efficiency goals are very clear, and initiatives like the CNC Program greatly assist the university and our design professionals in achieving these goals.”



**PROJECT:**  
**UIU Student Housing**

No longer are living spaces for college students simply bedrooms and shared baths. Today there are shared spaces that encourage communal living and provide for a more comfortable daily environment. At Upper Iowa University (UIU), the UIU Student Residence Hall had a similar goal: to create suite-style housing units that encourage a sense of community for the students, and to provide a space that students would value as a part of their educational experience, says Bryan Jolley, UIU executive director of facilities management and services. “Each of the buildings has a distinct feel that is

unique to the building,” he says.

The university used the CNC Program with several other buildings in the recent past, and knew it held benefits. “We were certainly looking to find energy savings and the value that it brings to an institution like ours,” says Jolley. “Our goal, as with all of our projects, is to reduce our energy consumption as inexpensively as possible.”

The CNC analysis for UIU held some surprises, says Jolley. “After South Village #1, we learned that we captured more value than what was expected, so we maintained the same general designs for #2 and #3,” he says. The CNC Program provided services for designs #2 and #3, through the Volume Build track option available for identical designs.

While the national debate on rising tuition costs continues, analyses like those from the CNC Program play an important role. “With any institution of higher learning, we want to provide a competitive education with value,” says Jolley. “This type of economical and energy-efficient design is a real way that we are able to reduce costs, not just during construction, but for the future, allowing us to keep our cost at a value students want and need.”