

Carbondale City Hall and Civic Center RCx study

Introduction

The City of Carbondale's City Hall and Civic Center is the heart of Carbondale. The city hall provides office space for city government, staff and public services, while the civic center provides space for meetings and social events. This 48,450 square foot facility received an energy assessment ten years ago, but Mark Bollmann, Facilities and Property Management Manager for the City of Carbondale, felt that the building energy systems could be more efficient.

Bollmann reached out to SEDAC to complete a Retrocommissioning (RCx) study, funded by the Ameren Illinois Energy Efficiency Program. RCx works to ensure that equipment and systems function as intended and operate at optimal efficiency. SEDAC's RCx report recommended energy reduction measures that could save the facility \$18,100 in annual energy costs, a 24% reduction. See the table below for estimated savings and project costs for each recommended measure.

RCx: Low-cost measures bring big savings

Actual project costs (\$26,000) were somewhat higher than estimated in the RCx report, but total incentives provided by Ameren Illinois were also much higher than estimated (\$22,284).

With the added incentives, Carbondale was able to achieve a simple payback of **less than two months** for the measures implemented.

Recommendation	Electricity Savings (kWh)	Gas savings (therms)	Energy Cost Savings	Estimated Project Cost	Potential Incentives	SPB with incentives (yrs)
Decrease VAV minimum airflow	49,000	12,000	\$11,900	\$10,000	\$4,700	<1
Open HW Pump Throttling Valve	22,000		\$1,400	\$800	\$400	<1
Reduce Fan Static Pressure	23,000		\$1,500	\$1,600	\$500	<1
Increase VAV Set Point Differential	28,000	3,000	\$3,800	\$3,800	\$1,400	<1
Adjust Boiler Reset		600	\$400	\$1,000	\$0	2.3
Schedule HW Pumps	4,000		\$200	\$2,100	\$0	9.2
Total	108,000	16,000	\$18,100	\$19,300	\$6,800	1.1

A team effort

RCx is a collaborative effort. A team of engineers from SEDAC worked with Mr. Bollmann and other administrators on the project. Mr. Bollmann provided utility bills, building plans, and equipment documents for the SEDAC team to analyze. After a site visit and utility bill analysis, the SEDAC team analyzed the data and created a report with energy-saving recommendations, focused on operations and maintenance.

SEDAC also provided assistance when Mr. Bollmann began implementing the recommendations. The building and maintenance staff was able to complete most of the recommendations on their own, further reducing implementation costs. All measures were eventually implemented.



Review utility bills/plans



Review mechanical systems



Analyze/evaluate data and write the report

Benefits of RCx

Mr. Bollmann explains that the two main benefits of RCx are cost and comfort. "If there is a chance to save money, we're all for it," he says.

The comfort benefits are an added bonus. "The VAV systems weren't working efficiently. Once we fixed those, those areas became more comfortable. We don't get many comfort complaints," he says.

Working with SEDAC

Mr. Bollmann enjoyed working with SEDAC team.

"The ease and professionalism working with SEDAC is tremendous. Your staff is full of knowledge, and you give it freely to us. Kim has called me every step of the way and helped with the application process. We appreciate her commitment."

Top energy-saving recommendations

Decrease VAV Minimum Airflow

- **Existing operation:** VAV minimum air flows are often set close to 50-60% of the maximum design air flow. This leads to spaces being over cooled, using excess reheat energy and increased fan use.
- **Recommendation:** Reduce the VAV minimum air flow settings from 60 to 30% on applicable VAV box settings.
- **Energy cost savings:** \$11,900 per year

Increase VAV Set Point Differential

- **Existing operation:** Heating and cooling temperatures overlap, allowing for simultaneous heating and cooling.
- **Recommendation:** Change set points for all VAVs from 72°F to 75°F for cooling and from 75°F to 70°F for heating. The proposed 5°F dead band setting helps prevent simultaneous heating and cooling.
- **Energy cost savings:** \$3,800 per year

Reduce Fan Static Pressure

- **Existing operation:** The facility currently has a fixed static pressure point that is too high for RTUs (2.2").
- **Recommendation:** Reduce the static pressure of RTUs to between 1.0" and 1.5" to reduce fan speed, and thus energy, as well as slightly reduce cooling due to reduced fan motor.
- **Energy cost savings:** \$1,500 per year

Learn more

Want to learn how your facility can apply for a SEDAC RCx study? SEDAC offers RCx services for non-residential facilities in Ameren Illinois territory. We are happy to provide RCx services to other facilities for a fee or direct you to available RCx services in your area. Go to sedac.org/rcx.

Want to know more about the RCx process? Check out our [RCx Tech Note](#).

Check out other RCx case studies:

- [Pekin Community High School](#)
- [Joliet Junior College](#)
- [Harper College](#)
- [Cook County Courthouse](#)

Who we are

SEDAC assists buildings and communities in achieving energy efficiency, saving money, and becoming more sustainable. SEDAC is an applied research program at the University of Illinois at Urbana-Champaign working in collaboration with 360 Energy Group.

SEDAC services include:

- Quick Advice | Energy Assessments
- New Construction | Design Assistance
- Long-term energy planning | Retro-commissioning