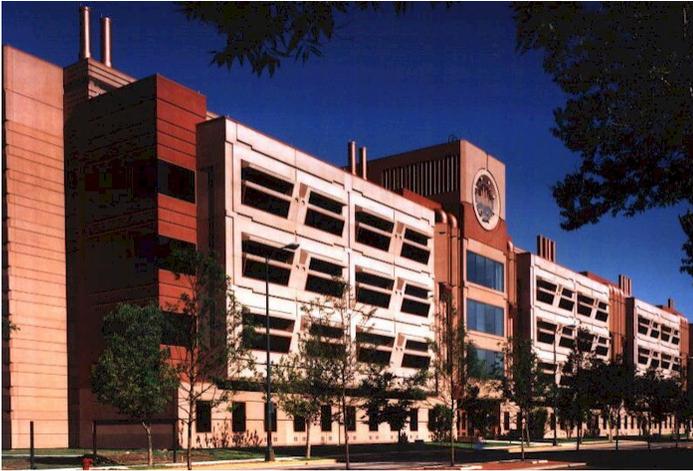


SEDAC CASE STUDY



UIC Molecular Biology Research Building



Molecular Biology Research Building
Photo credit: UIC

MOLECULAR BIOLOGY RESEARCH BUILDING	
Building Type:	Office, classrooms, and laboratories
Measures Identified:	<ul style="list-style-type: none"> Improvements to Air Handling Units Adjust Temperature Setpoints Install Occupancy Sensors
Building Size:	242,000 sf
Annual Energy Savings Identified:	3.8 million kWh 486,000 therms
Annual Cost Savings Identified:	\$844,000
% Cost Savings:	52%
Implementation Costs (with incentives):	\$6.4 million
Payback:	7.5 years

PROJECT SUMMARY

The University of Illinois at Chicago (UIC) Molecular Biology Research Building is located just a few blocks southwest of the downtown loop. The 242,000 square foot facility was constructed in 1995 and is used as office, classroom, and laboratory space by several college departments.

While laboratory facilities inherently use more energy, the Molecular Biology Research Building (MBRB) was consuming 43% more energy than a comparable campus research center. The energy consumption breakdown for the MBRB can be found in Figure 1.

To better understand where and how the facility was using energy, the University opted to participate in the Department of Commerce and Economic Opportunity (DCEO) Illinois Energy Now Energy Assessment program. This program is managed by the Smart Energy Design Assistance Center (SEDAC).

Grumman Butkus Associates, an approved service provider, performed the SEDAC energy assessment. As part of the investigation, they identified thirteen energy saving opportunities.

After successful implementation of these recommendations, UIC will reduce its annual energy costs by approximately

\$844,000. These measures include scheduling and implementing new models of energy efficient technology such as air handling units, variable speed drives, and occupancy sensors.

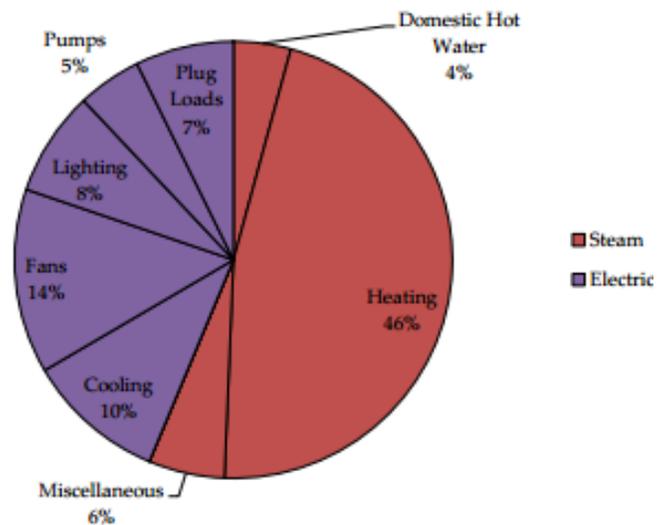


Figure 1: Estimated Energy Consumption Breakdown for the Molecular Biology Research Building

An estimated \$844,000 in annual energy savings were identified at the UIC Molecular Biology Research Building.

IDENTIFIED ENERGY SAVINGS IMPROVEMENTS TO AIR HANDLING UNITS



Air handling units (AHUs) are critical in circulating conditioned air within a building. Thirteen AHUs are grouped in pairs throughout this UIC building and serve distinct sections of the facility. These are constant volume systems —when the fan is on, a constant amount of air flows through 24/7—so there is no modulation of the fan power. The lab hood exhausts are also equipped with constant speed fans that operate continuously.

One energy cost reduction measure identified by SEDAC recommended converting AHUs #1-8 from constant volume to variable air volume (VAV). SEDAC recommended installation of

variable frequency drives (VFDs) as well. Converting to VAV and installing VFDs will provide the system controls with the capability to appropriately modulate motor speeds, thus reducing the energy currently being consumed to keep the fans running constantly. This upgrade will optimize the entire system.

Once this measure is implemented, UIC is estimated to save almost 3.6 million kWh and 415,000 therms each year, which would avoid annual utility costs of \$740,000.

ADJUST TEMPERATURE SETPOINTS

A strategic way to limit the amount of wasted energy is to schedule systems, such as heating and cooling, based on when the building is occupied. The MBRB administrative offices and conference spaces have set hours of occupancy, yet their space temperature setpoints remain constant. To reduce wasted energy, SEDAC recommended applying temperature setpoints when a particular space is unoccupied. Once this measure is implemented, the University can anticipate saving approximately 51,000 kWh and 5,110 therms, amounting to nearly \$10,000 annually.

INSTALL OCCUPANCY SENSORS

When a room is vacant, lights can be turned off to save energy. Occupancy sensor controls can turn off the lights in a room if that space is unoccupied. Sensors should be set to *Vacancy*, requiring users to turn on lights manually. SEDAC recommended installing an occupancy sensor on one of the two switches in each room. This energy saving measure will save approximately 85,000 kWh and nearly \$6,000 annually.



Occupancy Sensor
SEDAC Photo

BOTTOM LINE

SEDAC identified additional energy efficiency improvements for the UIC Molecular Biology Research Building. These improvements include incorporating VAV and VFD upgrades that would reduce the speed of fan motors, and scheduling VAV to heat and cool spaces based on occupancy. If these energy cost reduction measures are implemented, overall savings for MBRB will be approximately 3.8 million kWh and 486,000 therms on an annual basis. This potential energy reduction equates to a reduction of the facility's annual energy costs by approximately \$844,000.

WHO WE ARE

The Illinois Energy Now Program provides free comprehensive energy assessments to both public and private sector facilities in Illinois. These services delivered by SEDAC and its team of private sector service providers, help building owners identify opportunities for saving energy and improving the energy performance of their buildings. SEDAC is an applied research program at the University of Illinois at Urbana-Champaign. SEDAC works in collaboration with the 360 Energy Group and the Energy Resources Center at the University of Illinois at Chicago.

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