

Aircuity case study

Binghamton University

Using Airside Efficiency to Meet Energy Goals and Monitor Lab Conditions

RANKED AMONG THE PREMIER PUBLIC UNIVERSITIES in the country and also referred to as a “Public Ivy”, Binghamton University, state university of New York, is home to over 16,000 undergraduate and postgraduate students. Binghamton is one of four university centers in the State University of New York (SUNY) system and currently consists of over six colleges and schools. The university is experiencing ongoing growth with new buildings continuing to expand the campus footprint over the last several years.

As a member of the state university system, Binghamton University is also subject to New York State Executive Order 88, which requires all state facilities to reduce 20% of their energy consumption per square foot by the year 2020. The university has taken their commitment to sustainability even further through former Binghamton President Lois DeFleur’s signing of the American College & University Presidents’ Climate Commitment in 2009. In the university’s Climate Action Plan, Binghamton has pledged to reduce greenhouse gas emissions 60% by 2030 and become carbon neutral by 2050.

REDUCING VENTILATION SAFELY

HVAC typically accounts for 50-70% of total operational cost in lab buildings. Recognizing this, the facility planning department determined that one of the most impactful ways to reduce campus energy use was to implement conservation methods in their labs. In the past, the State University Construction Fund (SUCF) only approved fixed ACH rates for SUNY lab buildings. However, when the 2011 ASHRAE guidelines for labs were released, the SUCF supported the updated guidelines allowing for varying air change rates (ACH) based on constant monitoring of air quality conditions. This support paved the way for Binghamton to be the first SUNY campus to implement Aircuity’s solution as a way to safely achieve these desired results.

Aircuity continuously monitors the indoor environmental quality (IEQ) of laboratory spaces, providing

smart signals to the facility’s building management system. Ventilation rates are adjusted according to the actual conditions of the space, saving money while ensuring a safe, comfortable, and productive environment for researchers and lab occupants. The data collected is then analyzed to provide actionable information to facility & energy managers on overall building performance and to give Environmental Health and Safety (EH&S) personnel better insight to lab operations.

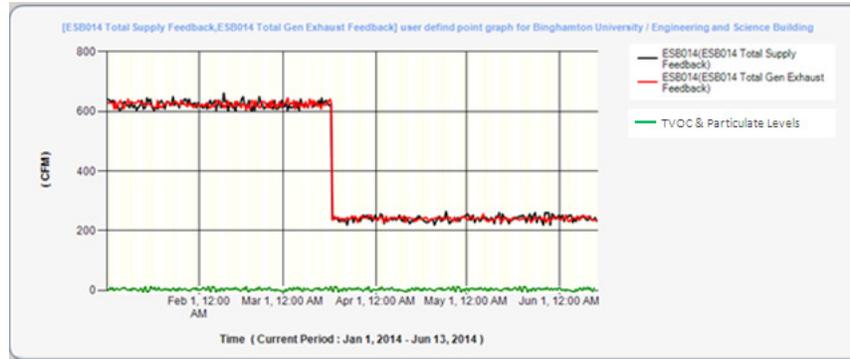
“Our lab facilities are great opportunities to monitor the air quality and then control the ventilation rates based on the room demand. In the vast majority of cases, we have been able to safely reduce those ventilation rates resulting in significant heating/cooling and fan energy reductions.”

Sandy DeJohn, Energy Manager
Binghamton University

IMPLEMENTING AIRCUITY

Binghamton University’s Engineering and Science building was selected for the first implementation of Aircuity’s platform. The \$66 million, 125,000-square-foot building was added to the Innovative Technologies Complex in 2012 and built with high efficiency fume hoods to save energy. Binghamton knew that the labs could be even more efficient by basing the amount of dilution air provided on the current needs of the space. Aircuity was installed in 32 lab rooms in the building with an overall target of 4 ACH, depending on thermal or fume hood air requirements. Based on the group of rooms that are not currently fume hood driven, the university has achieved a 42% reduction in CFM in approximately one half of the rooms; the remaining rooms are undergoing further analysis. Aircuity’s channel partner, Green Building Partners, assisted with the savings analysis used to estimate the performance based rebates available through the New York State Energy Research & Development Authority (NYSERDA). “Our lab facilities are great opportunities to monitor the air

Figure 1. CFMs were reset in mid March 2014. Room ESB014 base: 624 CFM, 10 ACH; post Aircuity targets achieved: 238 CFM, 4 ACH.



quality and then control the ventilation rates based on the room demand,” stated Sandy DeJohn, Energy Manager at Binghamton University. “In the vast majority of cases, we have been able to safely reduce those ventilation rates resulting in significant cooling/heating and fan energy reductions.”

TRACKING SUCCESS AND INVESTIGATING OPERATIONS

The university is using Aircuity's analytics as a way to proactively manage the labs and track their energy reduction. It has also been instrumental in investigating the rooms that were flagged as operating above the target CFM and are fume hood driven. The university used the analytics to watch conditions in the rooms as air change rates were turned down in incremental phases. Aircuity's data verified that overall chemical and particle levels were actually very low in the lab spaces. The first round of lower air change rates was initiated in late December 2013 and in January 2014. After monitoring for another period and seeing continued low levels of contaminants with reduced airflows, a second round of lower airflows was implemented in mid March to achieve the target levels of 4 ACH in the rooms that did not have a high hood demand

(about 70% of the rooms; see Figure 1). Another round of reductions is being considered for July 2014 based on room performance and airflow requirements.

The university is taking advantage of the other features Aircuity's data provides to help them monitor the everyday operation of the labs. “I like having the information to support that our laboratories are running with low levels of contaminants,” said Building Administrator, Chris Chase. “My weekly summary reports let me know at a glance if I have any persistent issues.”

WIDENING THE IMPACT

Binghamton University is expanding upon the energy

savings that they are achieving in the Engineering and Science building with an Aircuity installation in Binghamton's brand new Center of Excellence building. The implementation of Aircuity in 27 lab rooms and 10 non-lab rooms, including a lecture hall, was completed in March of 2014. The Center of Excellence is scheduled to be fully operational and open to students for the 2014 fall semester. Additionally, the university is planning to include Aircuity in the Energy R&D building, which is currently in design.

ABOUT BINGHAMTON UNIVERSITY

Binghamton University is a world-class institution that unites broadly interdisciplinary educational programs with some of the most vibrant research undertakings in the nation. The University's unique character is shaped by outstanding academics, facilities, and community life, promotes extraordinary student success—on campus and in the wider world. Binghamton University enrolls over 14,500 students in programs leading to Bachelor's, Master's and doctoral degrees. For more information visit www.binghamton.edu.

ABOUT AIRCUITY

Aircuity is the smart airside efficiency company providing building owners with sustained energy savings through its intelligent measurement solutions. By combining real-time sensing and continuous analysis of indoor environments, the company has helped commercial, institutional and lab building owners lower operating costs, improve safety and become more energy efficient. Founded in 2000 and headquartered in Newton, MA, Aircuity's solutions have benefitted organizations such as the University of Pennsylvania, Eli Lilly, Masdar City, the Bank of America Tower and the University of California-Irvine. For additional information on the company and its solutions, please visit: <http://www.aircuity.com>.

