Aircuity case study

Georgetown University

Aircuity Installation in Science Building Saves Energy; Data Uncovers Additional Savings Opportunities

Georgetown University in Washington, DC is one of the world's leading academic and research institutions, classified as a Very High Research Activity (RU/VH) University by The Carnegie Foundation for the Advancement of Teaching.

Completed in 2012, Regents Hall is a state-of-the art research and teaching center for biology, chemistry, and physics. With 154,000-square-feet of research space, it houses three classrooms, 12 teaching labs, and dozens of research labs in addition to conference rooms and student lounges. Knowing the enormous utility costs associated with running a science facility, Georgetown Energy and Utilities department invited Aircuity to evaluate how their platform could help reduce energy consumption while improving lab safety.

Regents Hall

Aircuity assessed the labs on an individual basis and determined that 65 were a good fit for the application of demand-control ventilation. A proposal with a calculated annual savings was presented to GU management and the project soon got underway. The system installation took three months with very minimal impact to research and teaching activities. Subsequently, the new control system was commissioned in May 2017. Within the first year, the actual energy savings was nearly $124,000.

Soon after completion, Georgetown's analytics identified 5 areas of opportunity that the University could address to reach their full savings potential.

1. FUME HOOD BEHAVIOR

Data from the Aircuity system showed that ten fume hoods were left at full operational height for many days in a row—some for several weeks. With each hood averaging ~ $4,500/year to operate (roughly same utility cost as a house), the ability to easily identify issues and modify behavior relative to these hoods provides for significant savings. Had these 10 hoods remained fully opened for year it would have cost the university $45,000.

Using this information, Environmental and Occupational Safety Manager, Casey Cahill, worked with Science Building Manager, Kavita Tanksale, researchers and students, to ensure these sashes are closed when the fume hoods are not in use. This action has achieved a measurable improvement.

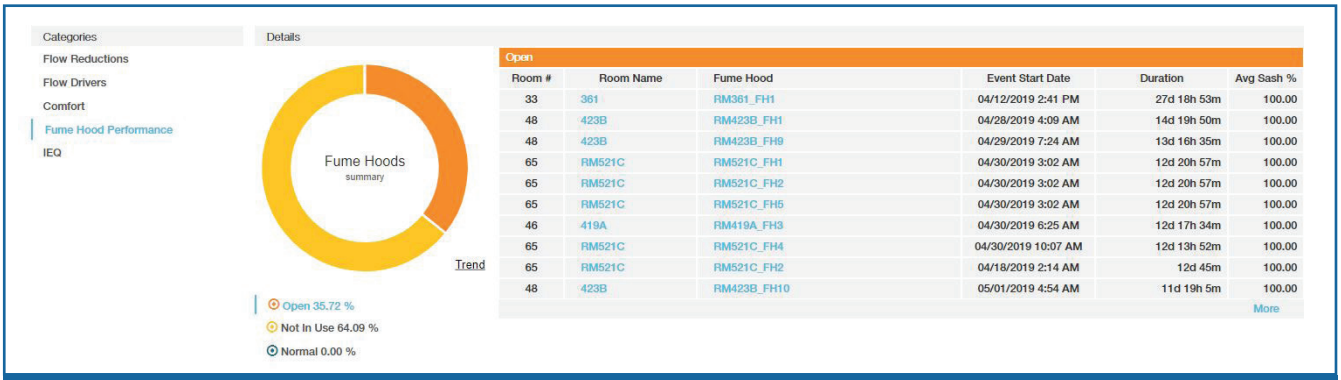


Figure 1 - Fume Hood Behavior

2. ROOMS WITH HIGH THERMAL LOADS

There were 13 rooms with cfm higher than their targeted rate. These excess flows total 2745 cfm, or approximately $13,725 in missed energy savings.

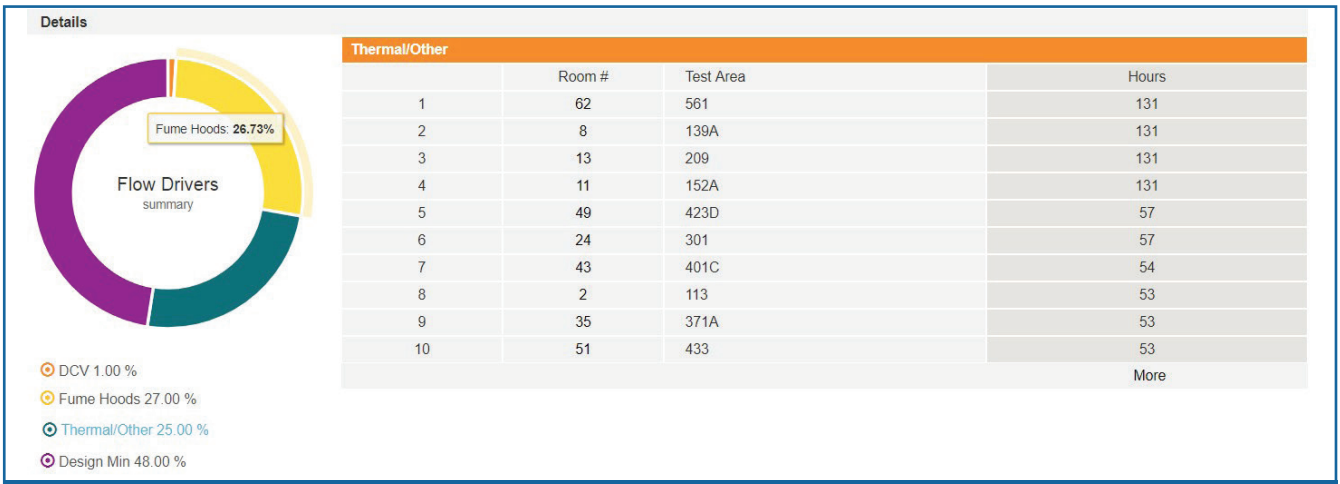


Figure 2 - Rooms with High Thermal Loads

3. ROOMS WITH FREQUENT DCV RESPONSES

These events are all within normal operating parameters and are sufficiently ventilated by the system. They caused an excess flow of approximately 750 cfm.

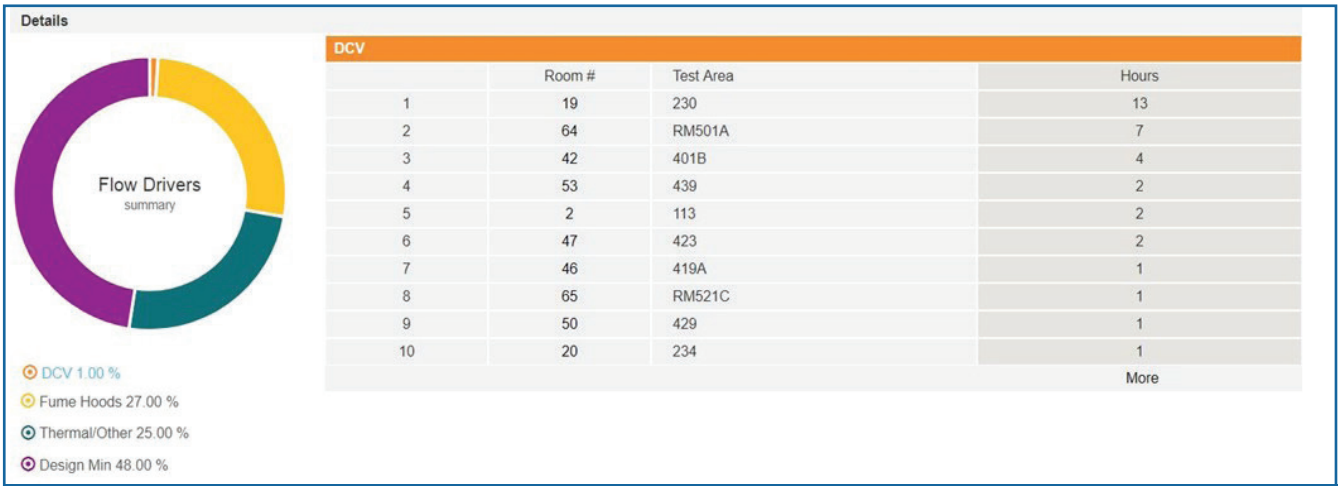


Figure 3 - Rooms with Frequent DCV Responses

4. INCORRECTLY PROGRAMMED FUME HOODS

Fume hoods were found going to their max based on occupancy, not sash position. Adding up the combined cfm that these hoods are running over their minimum, during the occupied periods (approximately 8:00 am to 8:00 pm), the difference between the min and max flows is a combined 7500 cfm. We see this issue during 60 of the 168 hours in a week = 35.7% of the time.

Estimating that a researcher works in their fume hood about 10% of the time,there is opportunity for saving 6750 cfm.

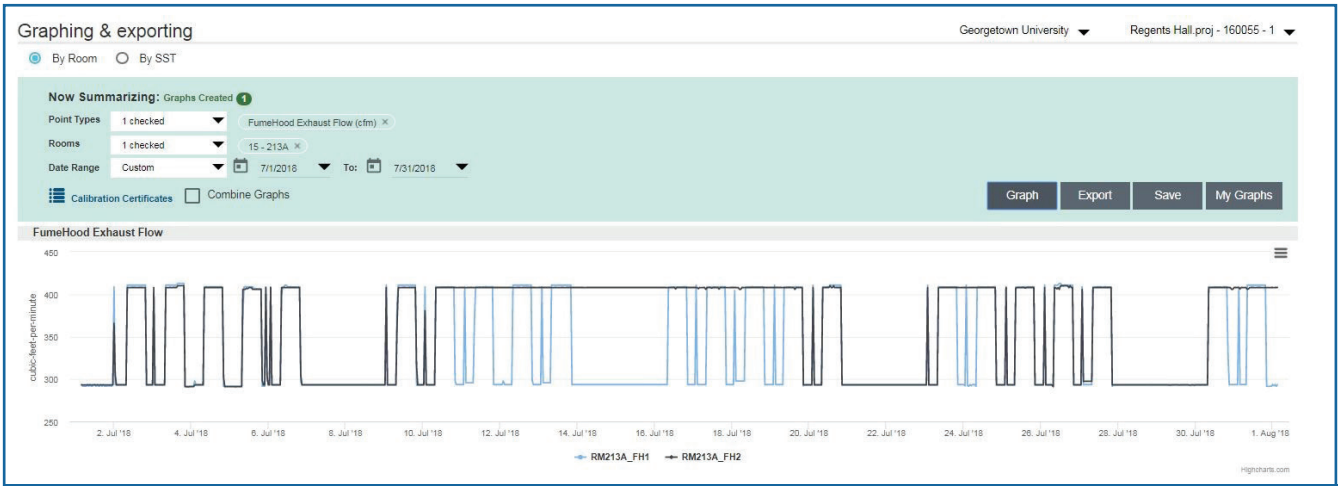
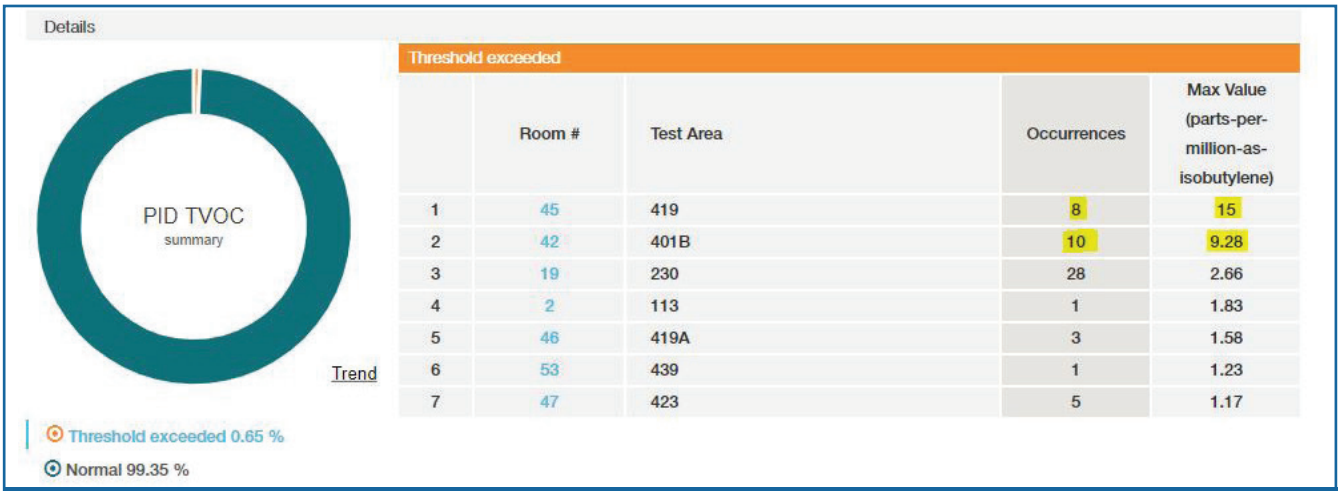


Figure 4 - Incorrectly Programmed Fume Hoods

5. INCREASED FAN POWER FOR MORE DUCT STATIC IN JUST ONE ROOM

Georgetown had previously added a single fume hood for a researcher at the end of a duct run. When they realized it didn't have enough static to make the face velocity, the exhaust fan speed was increased. Aircuity's data helped them realize that someone had turned up the exhaust fan system for an entire section of the building in order to make this single fume hood work.

In addition to understand the full savings opportunity, Georgetown's Environmental, Health & Safety department used the information displayed at the Aircuity portal to verify the high performance of rooms, relative to Indoor Environmental Quality (IEQ). The MyAircuity web app automatically ranks the rooms by their IEQ performance. Casey Cahill looked at the analytics and immediately identified a room that had considerably more IEQ events over the prior two weeks. Armed with this information he went to the specific room to contain the source of the contaminants.



Threshold exceeded

	Room #	Test Area	Occurrences	Max Value (parts-per-million-as-isobutylene)
1	45	419	8	15
2	42	401B	10	9.28
3	19	230	28	2.66
4	2	113	1	1.83
5	46	419A	3	1.58
6	53	439	1	1.23
7	47	423	5	1.17

Figure 5 - Increased Fan Power for More Duct Static in Just One Room

Using the Aircuity 2.0 Platform, Georgetown University has:
► Delivered energy savings in an already cutting-edge building
► Gained quick and easy access to actionable information that is valued by multiple stakeholders
► Created measurably better environments for all occupants

Currently, Georgetown is developing a second project for its main campus.

ABOUT GEORGETOWN

Georgetown University is one of the world's leading academic and research institutions, offering a unique educational experience that prepares the next generation of global citizens to lead and make a difference in the world. We are a vibrant community of exceptional students, faculty, alumni and professionals dedicated to real-world applications of our research, scholarship, faith and service.

Established in 1789, Georgetown is the nation's oldest Catholic and Jesuit university. Drawing upon the 450-year-old legacy of Jesuit education, we provide students with a world-class learning experience focused on educating the whole person through exposure to different faiths, cultures and beliefs.

Students are challenged to engage in the world and become men and women in the service of others, especially the most vulnerable and disadvantaged members of the community. These values are at the core of Georgetown's identity, binding members of the community across diverse backgrounds.

ABOUT AIRCUITY

Aircuity creates smart airside solutions through its intelligent building platform, significantly reducing energy costs and improving the indoor environmental quality for occupants. As the demand control solution, Aircuity optimizes ventilation rates through its patented technology. As a result, commercial, institutional and lab building owners can lower operating costs, protect occupants and verifiably reduce energy use by as much as 60 percent. Founded in 2000 and headquartered in Newton, MA, Aircuity's solutions have benefited over 400 organizations such as Google, Amazon, Eli Lilly, Masdar City, the University of Pennsylvania, and the University of California-Irvine. For additional information on the company and its solutions, please visit: www.aircuity.com.

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