

“Andromeda” Star of Energy Efficiency

Nominee: Aircuity, Inc.

Aircuity provides a unique solution that significantly reduces the energy associated with ventilating many different types of commercial buildings, including laboratories, health care facilities, commercial office buildings, and schools. By continuously monitoring indoor air for many different potential contaminants, Aircuity can adjust ventilation rates to maximize energy efficiency while ensuring a safe, comfortable, and productive work environment.

Uniqueness of solution: While the general approach to optimizing ventilation (known as Demand Control Ventilation or DCV) has been around for decades, technical challenges associated with the reliability and life cycle costs of sensing technology have limited the success of DCV. Aircuity has developed a deployed a unique system architecture that addresses these shortcomings, delivering significant savings that can be realized year after year (the brevity of this application eliminates the opportunity to describe the innovation of this application in any detail).

Evidence of energy savings: Direct evidence of energy savings can be measured (in different degrees of accuracy) depending on the specific type of application. In commercial buildings, schools and other variable occupancy spaces, the reduction of ventilation saves heating, cooling, and fan energy, and superior humidity sensing expands on these savings by optimizing economizer hours. In laboratory and some health care environments these savings are much more significant because they use 100% outside air without recirculation. Energy savings can be directly measured by reduced airflow, generally monetized by energy managers on a cost per cfm (cubic feet per minute of air) which typically ranges from \$4-7 cfm.

Estimated savings: Aircuity has more than 350 installed systems in operation. Using a very conservative methodology (and counting only the laboratory space, which approximately 17M sq ft of a total installed 50M sq ft of monitored facilities), Aircuity is saving 187,170,000 kWh annually, with an additional 15,400,000 in Therm savings. The combined energy savings **annually** would be more than 2Billion MBTU's.

Estimated savings to date: Aircuity began delivering its system in 2007, and savings to date based on the approach above are estimated to be approximately 6.8 Billion MBTU's.

Energy Savings Potential: There is an estimated 700million sq ft of laboratory space alone in the United States, more than half of which would be applicable to Aircuity solutions.

Evidence solution can be replicated: Aircuity has sold more than 500 systems, with 350 installed and operating in all target market. Aircuity is the core technology in the University of California's Smart Lab program, which is a DOE Better Buildings Showcase partner. Aircuity is in the first LEED Platinum skyscraper in NYC (One Bryant Park) and has been selected for installation in Apple's new HQ. Aircuity is in the first Net Zero School (Richardsville KY) and is the basis of design by CMTA architect & design firm in the Midwest. Aircuity integrates to all building control systems (Siemens, JCI, Honeywell, etc.).

Innovation & Creativity: multiple patents have been awarded based on this design which included the development of unique carbon nano-fiber tubing to transport air samples to centrally located sensor suites.