Energy Performance Contracting
Approaches for Lowering Laboratory Energy Costs

Introduction
Johnson Controls’ Energy Performance Contracting helps organizations make their energy efficiency goals a reality by keeping facility upgrades within financial reach.

Energy Performance Contracting uses a finance model that guarantees savings through energy efficient retrofits, and also eliminates the need for capital investment.

Performance contracting guarantees that building improvements will deliver operational and utility savings over a fixed period. It is a low-risk option for building owners because we pay the difference if the savings do not accrue.

Process
Johnson Controls is able to bring efficiency solutions to governments and businesses in a few months through various different building retrofits. We perform a preliminary audit to determine project feasibility, followed by an in-depth engineering audit to determine recommended efficiency measures once the customer is committed to the project. Once a contract is signed, technicians, construction crews, and engineers begin implementing the project.

Performance Contracting and Laboratories
Laboratories consume the largest amount of energy on a campus or within a facility, so finding ways to reduce laboratory energy consumption can have a major impact. Johnson Controls can offer various solutions to decrease laboratory energy costs depending on the client needs. One product in particular that is popular with Johnson Controls Energy Performance Contracting and other ESCOs is the FlowSafe Stable Vortex® II Fume Hood.

This fume hood was designed to create a safer working environment for users, but a byproduct of the elegant design is that it requires significantly less airflow to properly contain compared to conventional fume hoods and other “low flow” fume hoods on the market.

Smarter, more efficient buildings not only have lower utility bills and lower costs of operation, but also improve the health, safety, and comfort of the people living and working in them.
FlowSafe Stable Vortex Fume Hoods

Safety with Increased Energy Efficiency

About FlowSafe Fume Hoods
The patented FlowSafe Stable Vortex II Fume Hood is different from conventional fume hoods. The aerodynamic design constantly senses and responds to environmental airflow disturbances and physically adjusts its back baffle to ensure stable airflow movement within the hood and prevent the back flow of dangerous chemicals into the user’s breathing zone. FlowSafe Fume Hoods are often a vital part of performance contracting, as they can safely operate using 40-50% less energy when compared to conventional fume hoods. FlowSafe Fume Hoods also reduce the load on the overall HVAC system of a facility, which positively affects the comprehensive bottom line. Features include:

- Better protection for the user
- Actively responds to dynamic conditions
- Horizontal/vertical combination sash for full-body protection and easy hood loading
- Requires less airflow to properly contain so it is inherently energy efficient
- Less required airflow makes working with fine dusts and powders easier
- Quieter hood, ideal for learning labs

Stable Vortex Conversion Kit
The Stable Vortex Conversion Kit adapts conventional fume hoods into high performance, low flow fume hoods that deliver a superior level of safety for the user, while providing substantial energy and cost savings for a laboratory facility. The Conversion Kit is installed by removing the internal working components of the original fume hood, and installing the Stable Vortex® component in its place. The Conversion Kit enables facility managers to upgrade their laboratories without having to entirely replace fume hoods. This not only saves money, but also allows for a more flexible installation schedule, as managers aren’t required to decommission entire labs to upgrade hoods.

FlowSafe Fume Hoods can, on average, reduce laboratory airflow consumption rates by 40–50%.
Project Examples

Utilizing FlowSafe Fume Hoods for Energy Savings

Maryland Department of Agriculture
The Maryland Department of Agriculture (MDA) provides protections for consumers, farmers, food processors, and agricultural businesses. It also plays a vital role in testing and diagnosing samples from avian influenza to West Nile virus.

The MDA was part of a larger state-wide performance contract with Johnson Controls, and the team investigated various alternatives for reducing energy consumption within their laboratories, including a variable air volume approach, but the project also involved meeting the preferences of the users, as they were quite particular about their workspace.

While the performance contracting team considered FlowSafe Fume Hoods for their energy efficiency, the researchers really liked the horizontal sash as it provides full torso protection, and that the hoods operate much more quietly compared to other fume hoods.

The consensus of both the users and the energy team resulted in the installation of 30 FlowSafe Fume Hood Conversion Kits, which were able to be installed on a rolling basis so as not to interrupt the important work of the MDA.

The FlowSafe Fume Hoods provide consistent, predictable cost and energy savings, which will provide funding for future facility updates.

University of Illinois at Chicago
The University of Illinois at Chicago (UIC) is a mix of research laboratories, teaching laboratories, healthcare facilities, and classroom buildings. The campus encompasses over a hundred buildings and 15,000,000 sq. ft. An aging infrastructure and increasing budget constraints led the UIC to consider an energy service performance contract to renovate key laboratory buildings.

The project’s energy conservation measures included lighting upgrades, HVAC replacements, enhanced building controls, and over 350 FlowSafe Stable Vortex® II Fume Hoods.

UIC’s extensive fume hood order as quite customized. Hoods of various sizes were manufactured to mimic previously installed fume hoods in order to fit onto existing cabinetry. The manufacturing team also diligently replicated each previously installed hood’s utilities like gas, vacuums, and sinks into the new Stable Vortex® II hoods so utility connections would be seamless and convenient.

The major energy reduction from the laboratory retrofit enabled the university to meet its climate action and cost saving goals.

JCI has implemented more than 3,000 performance contracts in North America alone.
A Complete Solution

About Johnson Controls
Johnson Controls is making the world safer, smarter, and more sustainable – one building at a time. We can consult with you to help you examine the whole of your facility infrastructure to improve safety, reduce costs, and increase sustainability and efficiency. Our technology portfolio integrates every aspect of a building – whether laboratory and healthcare controls, security systems, energy management, fire suppression or HVACR – to ensure that we exceed customer expectations at all times. We operate in more than 150 countries through our unmatched network of branches and distribution channels, helping building owners, operators, engineers, and contractors enhance the full lifecycle of any facility. Our arsenal of brands includes some of the most trusted names in the industry, such as Tyco®, YORK®, Metasys®, Ruskin®, PENN®, Simplex® and Grinnell®, and now the Triatek® line of critical environment controls.

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