bioMérieux HVAC Retro-Commissioning & Optimization Case Study

OPTIMUM ENERGY

Retro-commissioning uncovers major efficiency gains across complex lab and support spaces

BIOMÉRIEUX

Durham, NC

Pharmaceuticals
Industry

5+
Years with Optimum

$200,000
Project Cost

$236,000
Year 1 Utility Savings

Project Details & Scope

Facility: BioMérieux Pharmaceutical Manufacturing Campus, Durham, NC

Building Size: 295,000 square feet

Buildings in Scope of Work: Administrative, Warehouse, Packaging & R&D

Completion Year: 2025

Air Handling Units: 14 AHUs + 154 Terminal Units

Control System: Johnson Controls Metasys BAS

HVAC Configuration: Single duct variable volume AHUs with VAV and FPVAV terminal units and hot water reheat

Project Investment: $200,000

Year 1 Utility Savings: $190,000

Year 1 CO_2 Avoided: 1,800 tons

Simple Payback: 0.85 years

Timeline: Completed ahead of schedule

Executive Summary

To advance its commitment to energy efficiency and carbon reduction, BioMérieux partnered with Optimum Energy to expand beyond OptimumLOOP® chilled water optimization into a full retro-commissioning study addressing both supply and demand sides.

What began as an exploratory review quickly developed into a full-scale project spanning laboratory, administrative, warehouse, packaging, and R&D facilities. The assessment revealed extensive simultaneous heating and cooling, suboptimal control sequences, and faulty hardware—leading to a phased program of corrections, re-sequencing, and setpoint resets targeting July 2025 completion.

Over a four-month period, the Engineering Solutions team worked systematically across all building types, prioritizing the highest-impact fixes first and layering in controls optimization to deliver sustained savings well beyond the project timeline.

Challenge: Simultaneous Heating & Cooling Across a Complex Campus

The 295,000 sq. ft. campus presented a classic retro-commissioning challenge: labs, warehouses, and administrative offices all served by aging control sequences that had drifted from their original design intent.

The core issue was extensive simultaneous heating and cooling—VAV reheat coils actively heating supply air the cooling system had just conditioned. Combined with a stuck valve and suboptimal sequences across 14 AHUs and 154 terminal units, energy was being wasted continuously at scale.

Without intervention, these inefficiencies would have continued to grow as the campus expanded—quietly inflating utility costs and carbon emissions with no visibility into the root cause.

Timeline & Site Visits

Four-month phased optimization program

Phase 1: Scheduling, Setpoints & Ventilation
Initial site visit focused on occupancy scheduling, setpoint resets, and ventilation adjustments across administrative, lab, warehouse, packaging, and R&D facilities. The team began developing a hardware deficiency log to help BioMérieux's facilities team track and plan replacements.

Phase 2: Control Logic & Sequence Corrections
Building on Phase 1 findings, the team addressed control logic errors and sequence corrections. Faulty hardware was corrected, including a stuck valve that had been forcing the system to compensate with excess energy. VAV and FPVAV terminal unit sequences were reprogrammed across all 154 units.

Phase 3: Fine-Tuned Program Adjustments
Concluding visits fine-tuned program adjustments across all facilities. By early June, targeted HVAC systems were operating with unnecessary reheat eliminated, economizers properly sequenced, and setpoints dynamically resetting to deliver efficiency gains while maintaining comfort in all building types.

Project Benefits

- $236,000 in Year 1 utility savings
- 1,800 tons CO_2 avoided in Year 1
- Eliminated simultaneous heating & cooling waste
- Unnecessary reheat removed across all AHUs
- Economizers properly sequenced
- Dynamic setpoint resets implemented
- Occupancy schedules across all buildings
- Hardware deficiency log for future planning
- Sustained savings, cost reduction & carbon footprint reduction

Scope of Work

Engineering Analysis
Comprehensive engineering analysis of all spaces and requirements across the 295,000 sq. ft. pharmaceutical manufacturing campus, covering administrative, warehouse, packaging, and R&D buildings.

Terminal Unit Reprogramming
Full reprogramming of all 154 terminal units (VAV and FPVAV with hot water reheat) on the JCI Metasys BAS to correct sequencing errors, eliminate simultaneous heating and cooling, and align operation with design intent.

Air Handler Optimization
Optimization of all 14 single duct variable volume air handling units including supply air temperature resets, duct static pressure resets, economizer sequencing corrections, and control logic tuning.

Occupancy Schedules
Implementation of occupancy-based schedules across all building types to reduce airflow, heating, and cooling demand during unoccupied periods—delivering ongoing savings without capital investment.

Hardware Deficiency Log
Development of a structured hardware deficiency log to give BioMérieux's facilities team a clear roadmap for tracking and planning future equipment replacements identified during the retro-commissioning process.

Results & Highlights

- **$236,000** Year 1 utility savings
- **$200,000** Project cost
- **1,800** Tons CO_2 avoided (Year 1)
- **154** Terminal units reprogrammed
- **14** Air handling units optimized

"By responding swiftly to BioMérieux's decarbonization roadmap, OE uncovered and eliminated the single largest energy wasters—reheat loops and a stuck valve—before any major equipment work began. With that foundation in place, SVT adjustments, dynamic setpoint resets, and precise control re-sequencing have driven significant, verifiable energy savings."

— Optimum Energy Engineering Solutions Team