



UNITED TECHNOLOGIES CARRIER CORPORATION

HVAC System Optimization



MAXIMIZING PERFORMANCE, ENERGY SAVINGS & COMFORT

Revitalize Your Building's System

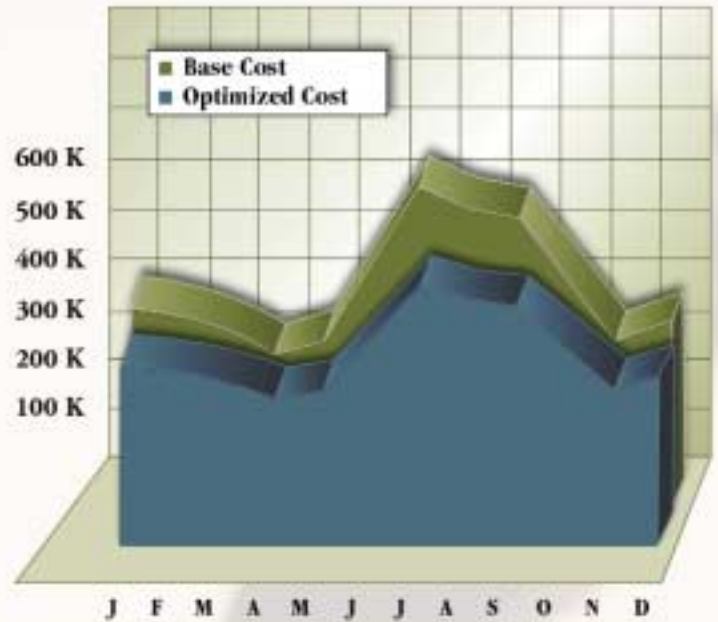
Sometime between the initial purchase and the need to replace your HVAC system, chances are its performance will have considerably degraded — despite even the best maintenance efforts. You might not notice it. You might not make the connection to rising utility bills, system inefficiencies or decreased comfort and productivity levels. But close examination could reveal that the benefits your system was designed to deliver are no longer reaching your building's occupants or your bottom line. The cumulative effects of changing conditions, less than optimal advice and incorrect adjustments can put you at risk for costly repairs, system failure and dissatisfied tenants.

Carrier Corporation's HVAC System Optimization program was created to help you recapture and even improve on the original performance specifications of your chilled water, air distribution and controls equipment. Through this innovative program, Carrier experts will precisely identify energy drains and system inefficiencies — and implement corrective actions to revitalize your system and your profitability.

System optimization is more than a tune-up. It starts with a complete energy evaluation of your system as a whole, in addition to each part. This is accomplished by metering both chilled water and airside components to accurately pinpoint how your energy dollars are being spent.

The Carrier team then goes to work analyzing strengths, weaknesses and opportunities for improvement. They will develop a plan of action to adjust and upgrade your system for maximum efficiency and minimized costs — total system optimization. In the process, you and your facilities personnel will gain valuable insights into how your system functions and how operational decisions can affect power usage and utility expenses. Not only will you see operating cost savings, but we will help you to implement energy management strategies to maintain peak efficiency, reduce consumption and enhance comfort into the future.

Total Building Operating Cost



HVAC system performance can degrade over time, causing operational costs to creep up gradually. By the time the increases are noticed, you may be paying substantially higher utility bills and maintenance costs. A Carrier HVAC System Optimization can bring your system back to peak efficiency, dramatically lowering your energy consumption, risk of failure and operating costs.

The Steps to System Fitness

The Process

Carrier approaches System Optimization with a commitment to partnership and collaboration. We believe in long-term relationships where our specialists can get to know you and your system — and an exchange of information to ensure that our expertise is tailored to your building, your priorities and your budget.

Whether your energy use is electric, steam, gas, oil or a combination, you'll benefit from our extensive experience in a wide variety of worldwide applications.

Carrier looks at the whole — and all its parts — of your existing system for the keys to unlock the best possible performance. With a holistic view of your building, we integrate our evaluation of the separate components that



make up your HVAC system. You get a complete picture and a wealth of information that will give you the power to make better management decisions.

Our expertise in system analysis, design, engineering and project management means you can confidently turn the details over to us. Our specialists leverage the most advanced tools and technology to improve efficiency and reduce your operating costs. Whether your energy use is electric, steam, gas, oil or a combination, you'll benefit from our extensive experience in a wide variety of worldwide applications.

The HVAC System Optimization process includes system evaluation; analysis and recommendations; implementation; and ongoing optimization through monitoring and service.

The Details

In the evaluation phase, we meter key chilled water and airside components individually, and set up customized reports with your local utility rates to determine precise usage patterns. Separate profiles are generated for each type of energy used in your building — electric, gas, steam or oil. In addition, system efficiency and

Optimization How-to

A Carrier HVAC System Optimization project typically includes these four steps:

1. **System Evaluation.** Baseline data collection on power usage, utility bills, climate trends and system performance.
2. **Analysis & Recommendations.** Assessment of equipment operating efficiency under varying load conditions; proposed solutions for system enhancement and performance improvements.
3. **Implementation.** Execution of action plan; system adjustments and retrofits.
4. **Ongoing Optimization.** Continuing partnership; monitoring and service for future improvements.

outdoor weather trends are tracked. This information provides a baseline from which to understand your equipment in the context of your local climate and your energy costs.

Your System Optimization team will assess your chilled water and airside equipment to determine such performance indicators as how much energy each component is using; how outdoor temperature and humidity fluctuations affect cooling delivery; staging of chillers; and chiller part-load efficiency.

Carrier looks at the whole — and all its parts — of your existing system for the keys to unlock the best possible performance.

We then develop an action plan to address problem areas and capitalize on opportunities for energy conservation. Proposed solutions can include adjusting the system for optimized performance and/or adding efficiency-enhancing controls and variable frequency drives for pump and fan motors.

When the project is completed, a Carrier service agreement will ensure that your system continues to operate optimally. With a broad range of flexible options, you can choose the plan that best suits your needs for maintenance, repair and remote monitoring. In addition, we can provide guidance for proactive equipment management and replacement planning, to help your forecasting and capital budgeting process.

To make the HVAC System Optimization program convenient and affordable, Carrier offers creative financing options with attractive rates. Our selected lenders work together with you and your Carrier representative to structure the best package for your situation and your budget.

Get ready for improved performance, enhanced comfort, lower utility bills, reduced operating costs and longer equipment life.

The Results

Get ready for improved performance, enhanced comfort, lower utility bills, reduced operating costs and longer equipment life. Save your valuable investment capital for business priorities and expansion opportunities. Carrier's HVAC System Optimization program will deliver all of this and the added security of knowing your system is in the best hands in the industry.



Smart Strategy Saves You Money

A Carrier partnership puts capital back into your operation, increasing profitability and allowing you to take

advantage of asset improvement opportunities. Our HVAC System Optimization program will help you to:

Maximize Efficiency

- Use less energy
- Establish favorable demand charges
- Reduce utility costs
- Reduce overall operating costs
- Qualify for utility rebates

Improve Energy Management and Operational Strategies

- Collect data to leverage commodity purchases
- Know your precise energy costs for budgeting and fiscal decisions
- Access valuable performance and trend data for better management
- Identify conservation opportunities

Invest Wisely in Cost-Effective Improvements

- Add energy-saving controls and VFDs
- Take advantage of favorable Carrier financing for ancillary improvements
- Increase your building asset value
- Avoid large capital expenditures for replacement equipment
- Free-up capital for other uses

Tailor Your System for Actual Building Conditions

- Match system output to current building load
- Optimize system for seasonal climate fluctuations and part-load conditions
- Improve occupant comfort

Benefit from Carrier's Proactive Service Offerings

- Reduce repair bills
- Prevent emergencies and unanticipated downtime
- Choose monitoring for continual assessment and adjustment
- Prolong system life

Optimization at a Glance

Carrier's HVAC System Optimization experts deliver big benefits through intensive analysis and strategic improvements. From both a financial and a performance perspective, this Carrier program adds value to your system and your building.

For Building Owners and Financial Managers:

- Cost-effective system improvement to increase profitability and enhance asset value
- Expert assessment and guidance for replacement of selected components to avoid large capital expenditures
- Proactive system upgrades to minimize risks associated with emergency repairs and system failures
- Enhanced comfort to preserve facility productivity and tenant retention
- Energy conservation strategies to reduce utility demand charges
- Energy management assistance to reduce long-term operating costs
- Flexible financing options for affordable system enhancements

For Facilities Managers and Engineers:

- Metering of all HVAC components for in-depth, precise understanding of energy use patterns and costs
- Comprehensive HVAC system evaluation — overall performance as well as individual chilled water and airside components
- Analysis of building usage and weather trends to develop a site-specific optimization plan
- Service agreements and remote monitoring option for ongoing performance tracking and system adjustments

The benefits of working with Carrier experts will continue after your HVAC System Optimization is implemented, through one of our many flexible service plans. A long-term partnership with Carrier will ensure ongoing, proactive service for your system and sound planning for the future.



As the world leader in Heating, Ventilation and Air Conditioning, Carrier is committed to continually improving the quality of comfort we provide to our customers.

But our level of responsibility extends well beyond...

Carrier Corporation has identified six specific areas which directly impact how we, as a world manufacturer, balance our customers' needs for comfort with the environment's needs for responsible consumption.

These symbols graphically represent our six areas of concentration and will serve as visual reminders of the importance of managing our finite resources.

Each one of us at Carrier Corporation believes that, for generations to come, success will not only be measured by the quality of our products and systems, but also by how we have improved the quality of life.



Keep Your System In Shape With Carrier

In today's resource-conscious business climate, Carrier's HVAC System Optimization program will help you to address environmental as well as cost containment concerns. Our highly trained professionals will provide the guidance you need to pare down energy consumption, while creating a winning combination of comfort and efficiency.

With a century of industry leadership behind us and future technologies being engineered today, Carrier can help you at every stage in the life cycle of your HVAC equipment. To learn more about what System Optimization can mean for you, contact Carrier Commercial Services at 1.800.CARRIER or visit our Web site at www.carrier.com.

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