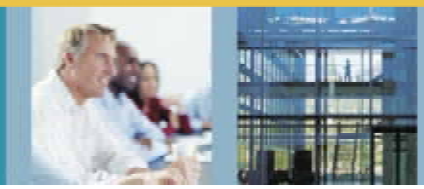
white paper TAC EnergyEdge



Reducing the Impact of Energy Costs on Business

Your roadmap to targeting energy efficiencies

in a dynamic business environment

t.a.c by Schneider Electric

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I. Executive Summary

TAC EnergyEdge

helps companies realize the benefits of energy efficiency with minimal risk and a ***large payback.***

Rising energy costs are a critical concern for executives, yet few companies have begun serious energy efficiency programs. The major reason for this oversight is that executives often view their facilities and energy use as a sunk cost, instead of an investment.

By leveraging energy and facilities as investments, companies can gain control of energy use and achieve high rates of return in the form of energy savings. The Internal Rate of Return (IRR) on these projects can be sizeable. In fact, they can be even greater than other corporate investments. When considering the cost of capital, the Modified Internal Rate of Return (MIRR) can be as high as 29 percent. Companies are also eligible for rebates from utility and government programs.

Benefits from this investment approach include double digit energy reductions, as well as improved building performance, worker productivity, and environmental responsibility.

The TAC EnergyEdge service helps companies realize the benefits of energy efficiency with minimal risk and a large potential payback. Our proven process, combined with a holistic view of facilities and ongoing proactive measures, gives companies the ability to invest in energy efficiency with a predictable rate of return. TAC EnergyEdge addresses all energy consumption in a facility, from the building “envelope” to the internal controls and systems, including lighting, heating, air conditioning, electricity, and water.

The comprehensive, step-by-step approach of TAC EnergyEdge allows executives to make informed decisions about their facilities and energy use. The result converts sunk energy costs into competitive agile assets.

II. Energy and the Corner Office

For CFOs and other executives, the quest to streamline operations and cut costs has never been more urgent. Ironically, a vital source of financial savings is all around them—the very buildings where they do business.

*Energy costs rose **31 percent** from 2003 to 2005*

The biggest issue is the surging cost of energy, which now makes up 30 percent of operating costs for the average company.[1]

According to U.S. federal figures, energy costs rose 31 percent from 2003 to 2005[2] and there is no indication that these costs will fall in the future. The US Department of Energy projects 30 percent sustained increases in the cost of electricity.[3]

The impact of high energy prices is felt in every corner office and boardroom. A recent Duke University study ranked high energy costs as the number one concern of executives, ahead of even healthcare costs and rising interest rates for US corporations. *Yet remarkably, the same study revealed that only a minority of companies have made any attempt to improve the efficiency of their facilities.*[4]

What explains this apparent contradiction? Why have business executives—who want to squeeze every ounce of performance from their operations—failed to take action when it comes to energy efficiency?

THE COST OF "BUSINESS AS USUAL"

There are ample reasons why companies have not acted. First, executives feel they can't spare the time, people or money to worry about facility overhauls. As long as the heating and air conditioning operates and buildings are secure, companies prefer to invest scarce available dollars on "more important" issues.

Reasons Why Companies Have Not Acted

- Executives can't spare the time, people, or money
- Prefer to invest scarce available dollars on "more important" issues
- Most facilities are managed on a reactive basis, rather than a proactive one
- Owners feel they solved facility issues years ago when they installed new controls or updated their systems
- Owners view energy issues as costs, not as investments

Second, most facilities are managed on a reactive basis, rather than a proactive one. Boilers get fixed when they start spewing steam. New controls are installed when the HVAC system finally breaks down. The typical facility manager is stretched just keeping up with repairs and maintenance within the budget—never mind requesting money to fix things that *aren't* broken.

The majority of building owners feel they solved facilities issues five or ten years ago when they installed new systems or lighting controls. Yet buildings drift out-of-control over time, as occupancy and use change, and technicians override controls to "fix" day-to-day problems.

[1] Energy & Power Management, "Connecting the Dots," Mark Jewell, June 1, 2006
[2] US Energy Information Administration, Annual Energy Outlook, 2006
[3] TheOpenPress.com, "Energy Survey and Waste Analysis Bring Big Savings through Energy Efficiency for Companies," December 7, 2005
[4] Duke University/CFO Magazine Business Outlook survey, Dec. 2005

A key reason for corporate inaction is that executives continue to view facilities and energy as *costs*, not as *investments*. Facilities and energy are part of the cost of doing business, they think. As with any drain on the bottom line, the goal is to minimize costs.

Thus, even with energy prices rising to historic highs, 58 percent of US facility managers say their budget has remained constant *or even decreased* from year to year.[5]

The result is inevitable: Companies face a growing problem of aging equipment, inefficient facility operations, rising maintenance costs, and uncontrollable energy prices. Trimming facility costs has not solved the problem. It has compounded it.

SEIZING THE OPPORTUNITY: ENERGY EFFICIENCY AS A MANAGEABLE INVESTMENT

For companies willing to take the initiative, energy "problems" offer a golden opportunity. Managing facilities and energy as assets that can be invested in—with a predictable return—is the solution.

"Investments in energy efficient electrical products afford tremendous economic opportunities," says Dr. Steven M. Bloom, principal of the financial consulting firm Capital Markets International, in an article for the Energy Cost Savings Council. He says the Modified Internal Rate of Return (MIRR) can be as high as 29 percent—significantly higher than most other investments a company is probably making.[6]

*The **Modified Internal Rate of Return** can be as high as 29 percent*

According to the Energy Cost Saving Council, this opportunity is great because so many building systems are aging and out-of-date. With advances in energy efficiency over the last ten to twenty years, there is dramatic room for savings in almost every area, "from ballasts and lamps to chillers, motors and drives."[7]

"When compared to other options," concludes Bloom, "energy upgrades should be viewed by CFOs and other operational executives as investment opportunities to stand up and cheer about."[8]

[5] Survey conducted in 2004 by the International Facility Management Association, FMLink, the Association for Facilities Engineering (AFE), The Association of Higher Education Facilities Officers (APPA), The Building Owners & Managers Association (BOMA) and Building Operating Management magazine.
[6] Energy Cost Savings Council, www.energystar.gov/ia/business/industry/bom.pdf
[7] Energy Cost Savings Council, www.energystar.gov/ia/business/industry/bom.pdf
[8] Energy Cost Savings Council, www.energystar.gov/ia/business/industry/bom.pdf

FINANCIAL BENEFITS AND MORE

The financial benefits of facilities investments are well documented.

Studies have shown that:

- ✓ The average building uses 20 percent more energy than needed
- ✓ Proactive maintenance can reduce the energy cost of a system by 5 to 10 percent
- ✓ Equipment upgrades and tune-ups can save 5 percent to 15 percent

Most significant of all, according to the US government program EnergyStar, "Organizations that improve energy performance outperform their competitors by as much as 10 percent."[9]

This Return on Investment (ROI) comes from more than just energy savings. One study found a two percent drop in employee productivity for each degree above 78°F in a typical environment. A similar reduction in productivity occurs when the temperature drops below 72°F.[10] How valuable is that productivity difference? Considering the cost of a company's payroll, a 1 to 2 percent increase in staff productivity could offset a significant portion of its energy budget.

Further energy ROI comes from government tax incentives. In the US, the Energy Policy Act of 2005 provides new tax deductions and credits for energy efficient and renewable energy investments. According to an article in *Energy & Power Management*, "Pursuing energy efficiency that exceeds code increases eligibility for these tax benefits while lowering lifecycle costs."[11] Finally, energy management offers every executive a chance to deal with environmental issues like energy and water use within a profitable initiative, instead of as a costly drain on finances.

For every degree

below **72 F**
or
above **78 F**

2 percent

Drop in workers' productivity

With all these benefits, the question is not whether to move forward with a corporate approach to energy savings, but how to go about it successfully, with a measurable program and predictable ROI.

[9] EnergyStar: http://www.energystar.gov/index.cfm?c=assess_value.bus_financial_value_calculator
[10] "Control of Temperature for Health and Productivity in Offices," Helsinki University of Technology Institute of Heating Ventilating and Air Conditioning, and the Lawrence Berkeley National Laboratory Environmental Energy Technologies Division.
[11] Energy & Power Management," Connecting the Dots," Mark Jewell, June 1, 2006

III. How TAC EnergyEdge Captures the Opportunity

Based on decades of experience and engagements with a wide range of companies, TAC EnergyEdge works with customers on a local or global basis to plan and control energy use through an ongoing, strategic energy efficiency program.

ENERGY EFFICIENCY AS A MANAGED PROCESS

TAC EnergyEdge helps our customers begin immediate and long term plans that reduce energy costs and give them better control of their facilities. We identify specific issues, estimate the investments required, and project the ROI that can be expected. Since TAC includes a program to sustain energy efficiency, savings estimates are likely to be realized.

We use a proven process to achieve optimum energy use throughout the lifecycle of a facility:

- Energy Assessment: We compare a customer's utility bills to similar facilities in the region to determine energy conservation opportunity.
- Preliminary Energy Report: A high-level site survey to identify potential energy conservation measures to align the customer's energy profile with business objectives.
- Comprehensive Analysis: Through a detailed energy analysis of the facility by a Certified Energy Manager, we create a program and plan to improve facility operation and meet energy targets.

Program Implementation: We work closely with customers throughout the implementation process to verify that goals are met, with regular milestones and reports.

Sustained Performance: We regularly review the project and results, make sure performance goals are met, and fine tune to ensure continued energy efficiency and savings.

A FOCUS ON PROACTIVE MEASURES

TAC EnergyEdge has found that companies are most successful with energy efficiency when they implement a sustained approach, including proactive Operations & Maintenance.

As mentioned earlier, buildings drift out-of-control without a managed energy efficiency program to sustain and care for its systems. Savings from past system upgrades can evaporate quickly.

The US Department of Energy's Federal Energy Management Program (FEMP) reports that energy losses from steam, water and air leaks, uninsulated lines, maladjusted or inoperable controls, and other losses from poor maintenance are considerable. FEMP's studies show that investing in proactive maintenance programs can save from 12 percent to 18 percent over reactive maintenance approaches, and many facilities could save more if they are purely reactive.[12]

[12] Federal Energy Management Program: http://www.eere.energy.gov/femp/operations_maintenance/strategies/strat_preventive.cfm

For this reason, TAC EnergyEdge always includes ongoing energy efficiency measures as part of our program to help sustain the desired Return on Investment.

A HOLISTIC APPROACH

TAC's review of energy efficiency takes a holistic approach to solving an energy problem. We find opportunities to leverage each improvement and to enhance others. This includes every aspect of facility operations to ensure financial and technical balance in an energy conservation program.

An Energy Cost Savings Council study found that the greatest cost savings are achieved when a range of technologies and applications are used. The report states:

> "In a sense, it works like compound interest. Each technology that is upgraded provides energy savings on its own. But it also provides a base on which other energy savings can grow. "[13]

The reverse is also true. Projects that are undertaken as one-off upgrades may look good on paper, but don't deliver expected returns. Using a holistic approach avoids the adverse impact of a less than stellar ROI.

A simple example of this is a retrofit of lighting that can appear to save 50 kilowatts per hour on paper. In the real world, when the weather is cold, the loss of heat, once provided by the inefficient lighting, must be made up by the heating system, thus the expected savings are eroded.

[13] Energy Cost Savings Council: www.energystar.gov/ia/business/industry/bom.pdf

Here's What We Look At:

Building Controls

Simple control adjustments can produce rapid energy savings. Are your building controls optimized for performance? Are lights and other systems running at the correct settings and at the right times? We look at optimizing controls first, rather than replacing them, through software changes or tune-ups; sometimes a simple adjustment in controls can improve efficiency significantly.

Mechanical

How do HVAC systems use energy throughout the building? Can the performance of chill water, distribution and steam systems be improved? Do air handlers and sequencers need upgrading or adjusting? Are outdated motors wasting energy? Replacing an old motor with a newer, high-efficiency motor can improve energy efficiency by 90 percent.

Electrical

How electricity is used and how efficient is the total system—from lighting and controls to office equipment, refrigeration, and kitchens? Since facilities use electricity in many ways, there are usually opportunities for savings.

Envelope

How does your building "envelope" perform, and how does it affect other energy systems? Could simple improvements to insulation yield significant savings?

Water

Water, like energy, is a resource that can be conserved to save money. Are cooling towers losing too much water to evaporation? Are you paying for sewage charges that could be avoided with metering? Can water heating be planned and managed to reduce costs, based on actual usage times and areas?

IV. Case Studies of Energy Savings

Case Study 1

For the owner of various manufacturing buildings and distribution facilities across the UK, rising energy prices and old, inefficient equipment were factors in enlisting TAC EnergyEdge for an energy solution.

Solution
Working with this customer to find appropriate solutions, the TAC EnergyEdge team introduced the latest building management system (BMS) and data logging capabilities and replaced old technology.

Gains
As a result, the customer gained intelligent control over its energy-related equipment and now collects energy consumption data to continue evaluating the progress of this project. After funding this initiative, the customer produced a 35 percent savings in electrical consumption and a 25 percent cost savings. In addition, the customer was recognized in its industry and has received awards for these efforts.

Case Study 2

Struggling with high energy costs, aging HVAC and lighting equipment, and little control of its equipment, a US-based industrial manufacturer needed to cut those costs while aligning its HVAC controls with its business objectives.

Solution
Outdated lighting equipment and HVAC roof top units were replaced. TAC also implemented network-based HVAC controls to serve production times and schedules. This manufacturer is now able to track its energy consumption through ongoing monitoring and reporting capabilities.

Gains
As required, the BMS is aligned with the company's goals. This energy management system has attained an annual savings of $241,000 with a payback of three years. The company and its building are positioned for continued efficiencies and financial success with a sustainable energy management solution in place.

Case Study 3

Although their structure was new, the owners of a London, UK-based tourist destination also sought ways to make their building more energy efficient while reducing environmental impacts and energy costs.

Solution
An energy management consultant dispatched by TAC monitored building performance and controls as well as emissions and consumption. From that data, an energy action plan was approved.

Gains
This initiative surpassed its goals: within the first 18 months, the company reported savings of more than £55,000. Electrical consumption was reduced by nine percent and gas consumption fell by 15 percent. The long term savings realized by the customer will help enable the implementation of more energy savings. Because it is operating more efficiently, the building's equipment is earmarked for a longer life span—saving the owner substantial maintenance costs.

Case Study 4

A London, UK-based retailer with 500 retail units sought to decrease utility costs while improving environmental conditions and plant efficiency. TAC used data analysis, benchmarking, and the compilation of a pre-visit report to create a best practice strategy for this retailer.

Solution
The TAC team then performed a one-day site visit to conduct an energy survey and identify energy saving opportunities. TAC followed up by implementing the recommended strategies. It also created a report outlining payback. Continued savings are ensured through post visit energy performance tracking.

Gains
After investing £131,000, this customer has achieved an annual savings of £750,000 and increased its plant life expectancy through reduced loading.

V. Conclusion

Viewing facilities and energy use as investments rather than costs allows companies to achieve high rates of return from energy savings while lowering lifecycle costs. Studies have shown that successful companies manage their energy in this asset focused way. It also enables companies to promote their energy efficiency and enhance worker productivity.

TAC EnergyEdge draws on worldwide resources and experience to examine every phase of energy use, helping companies take control of their energy investments with a program of immediate savings and sustained energy efficiency. The initial steps of this holistic approach are low cost and low risk. In the long term, proactive energy savings can easily reach double digits.

The result is that TAC EnergyEdge empowers executives to manage their company's energy consumption and achieve true competitive advantage.

ABOUT TAC ENERGYEDGE

TAC EnergyEdge is a service offering of TAC, a leading provider of building management solutions based on Open Integrated Systems for Building IT. TAC's mission is to provide added value through building environment services for indoor climate, security and use of energy, delivered with advanced technology to end users and property owners throughout the world. With over 80 years of experience in the HVAC, building automation and security arenas, TAC has over 5,000 employees worldwide with partners and branches in 80 countries. TAC's parent company, Schneider Electric, is the world leader in automation and electricity management, with 112,000 employees worldwide and operations in 190 countries.

WP-TACENERGYEDGE-US
September 2007

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