



Energy Management as a Corporate Strategy

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Overview

Today's businesses are struggling to find new channels for growth, improve operational efficiency, reduce the cost of energy, and provide a structure for timely decision-making. Arguably, the most pressing of these issues is the need to reduce the energy intensity of our businesses and to better manage these resources and costs.

In the volatile energy market of the 21st century, not including management in the organization's energy management decision-making can put the corporation's competitiveness at risk. This paper proposes a framework from which management can develop an energy management strategy.

Senior Management Must Step Up to the Energy Challenge

Any company that values sustainability should consider developing a corporate energy management strategy. Not only is energy a major component of most businesses production costs, the last thirty years have taught us that energy price volatility is here to stay.

During a recent G8 summit in St. Petersburg, Russia, world leaders were unable to forge agreements in many areas, but there was consensus around one topic: the need to "enhance global energy security." What leaders of nations are seeking policy solutions for, business leaders should be seeking in their corporations – securing reliable supplies of energy at a reasonable price. What was once the sole domain of energy traders and analysts must now be taken up by senior management. The board and senior management need to be actively involved in framing a corporate energy management policy and strategy.

For most industries, the cost of energy is outpacing all other variable costs. For example, the cost of natural gas increased over 250 percent from 1993 to 2006. The cost of fuels and power increased over 110 percent during this same period; the bulk of the increase, 81 percent, occurring in the last four years. Managers are asking, "What can we do to better manage these costs?" "How can we better utilize our valuable renewable and non-renewable resources?"

Additionally, companies are now recognizing that their customers expect them to be part of the national and global energy sustainability solution. Devising strategies to meet our current and future energy demands in an environmentally responsible way is no longer the sole work of academia and government.



A Corporate Energy Management Strategy

What should be included in a corporate energy management strategy? As a minimum, the following four components should be addressed: security of supply, security of price, energy efficiency, and environmental stewardship.

Security of Supply

Securing the organization's reliable supply of energy to fuel its operations can no longer be assumed. Shrinking reserves, instability in the oil-producing regions, and global climate changes are making it increasingly difficult for energy managers to secure delivery at expected prices. Fuel diversity, energy storage, on-site generation, and renewable resources should all be evaluated in the pursuit of securing your energy supply chain.

Security of Price

Hedging energy price volatility is a standard procedure for energy-intensive businesses. Consider companies that have historically purchased energy through standard utility tariffs. It would be prudent for management to develop strategies for non-traditional energy purchases. In fact, consider developing contingency plans to address the catastrophic events that can result in huge price swings. Such price fluctuations can place the company's ability to meet its business obligations at risk.

Energy Efficiency Programs

Evaluate strategies can reduce the energy demand-side of the business, and put energy efficiency programs in place. Such programs need not be elaborate. For example, installing energy efficient lighting and building energy management systems are a good start for an efficiency program. Next, empower a corporate "energy czar" with the responsibility of implementing the company's energy efficiency policy and programs.

Environmental Stewardship

Smart use of our renewable and non-renewable energy resources is everyone's job. Large *and* small corporations would do well to develop a corporate energy management strategy that incorporates fuel diversity (hydrocarbons, ethanol, bio-fuels), fuel storage (flywheels, batteries), and alternative energy sources such as wind and solar energy. Sustained high oil prices have brought the price point of alternative energy sources into economic balance. For example, the Chinese government is requiring that much of the country's new construction incorporate "solar shingles" to meet a large portion of on-site electrical demand. Corporations need to include an



environmental policy and strategy in their energy management plans because social responsibility is good business.

Execute, Execute, Execute

Perhaps the greatest challenge is to execute the strategy, rather than develop it. As a former Fortune 500 company energy manager, we built our execution plan around the “3 Ps”: People, Process, and Platform. We thought of these as the three legs of a well-balanced stool. Weakness in any one area meant our strategy had little likelihood of success.

People

Of course, it all starts with good *People*. The best process and technology platform will accomplish little without trained, motivated, and empowered employees. An energy management program will require the skill set of engineers, operators, analysts, and technology professionals. Analysts should be skilled in modeling and forecasting, and should have a good “business head.” Ultimately, energy management is solving a business problem. Good stewardship of factors of production is smart business. Engineers and analysts need to be armed with good data, or business intelligence – about your business and energy markets. They need to understand the options available to the company and receive room to experiment and innovate.

Process

Good people and the right technology platform will do little for a corporation that has ill-defined or inefficient business *Processes*. Process is the tracks on which engine of business operations run. Don’t waste technology investments if you haven’t defined and institutionalized the processes that will be required to leverage the technology. Get the business and operations processes in place first, or at least in parallel, or your technology investment will reap little benefit.

Platform

That gets us to the third “P” in strategy execution, *Platform*. To effectively implement an energy management strategy, you will need an intimate knowledge of your business. You need to understand the performance drivers behind your operation. You need to know your true operational and commercial constraints and degrees of freedom. What operational and financial levers can be pulled to improve energy efficiency, decrease energy losses, and diversify your energy mix?

In a knowledge economy, information in the hands of subject-matter-experts is the fuel for improving the performance of the enterprise; in this case it’s energy performance. Your energy management specialists will need large quantities of production data to review and analyze. However, raw data is frequently meaningless.



Data needs to be put into context through a relational connection to create information and meaning. Make sure you have a technology platform that allows you to relationally connect your process data streams with the context of your energy assets.

Your technology platform needs to be flexible enough to grow and adapt to your changing business enterprise. IT specialists call this flexibility the platform’s “scalability.” The platform also needs to handle unrestricted volumes of past, present (real-time), and future data. The planning function is the one functional area that ties the organization together. It is critical that procurement, production, and product liquidation planners draw their production forecasting data from a consistent, official-record-of-copy database. This real-time performance management platform will allow your energy management specialists to look across your entire enterprise to identify energy waste and opportunities for improvement.

Framing an Energy Improvement Strategy

A good way to frame the energy improvement opportunity is to ask and answer the following three questions for each energy asset in your enterprise:

- What is?
- What should be?
- What could be?

What is—Your Enterprise Performance Baseline

To know what is possible, you must first clearly understand what you have. An accurate and up-to-date performance baseline of your operation is a necessity. This first step indicates where many company’s entrenched, “status quo” mentality short-circuits much of the performance improvement opportunity. They think they *do* know what their baseline performance is, “Good grief, we’ve been doing this for years.”

It has been my experience in leading this type of exercise for the last twenty years that most companies do not know their baseline performance with sufficient accuracy and detail to implement an effective enterprise-wide energy management strategy. To determine your baseline performance, you will need lots of data and subject-matter-experts, such as engineers, analysts, and operators.

What Should be —Your “As-Designed” Enterprise Performance

The second step in implementing an energy management strategy is to know the design-level performance of your assets. Most equipment is not running at design-level performance due to inadequate system commissioning, performance degradation, and overly-conservative operating margins.



It is imperative to fully characterize and document equipment design performance so engineers and analysts can determine the gap between *what is* and *what should be*. Significant improvement in operational performance is possible by working to get assets operating at their designed-in performance levels. Tuning equipment to operate at design-level performance will, for many businesses, improve energy efficiency 5 to 15 percent and accrue savings of tens to hundreds of millions of dollars per year. Close work and cooperation with original equipment manufacturers (OEMs) and operations is critical to capturing these benefits.

What Could be—the Optimally Run Enterprise

In our energy hungry world, we must do more than achieve design-level performance from our energy assets. To extract the maximum benefit from our renewable and non-renewable energy assets, we must strive to optimize our processes. The goal of every energy engineer is to extract the maximum output from an energy process for every unit of input. Energy engineers strive to be good stewards of the energy resources available to them.

Operating beyond design performance requires corporations to be energy management innovators. This could take the form of internal “skunk works” that try new ways to squeeze additional performance from their assets, or evaluate the OEM equipment limits to determine if additional “margin” left in the machine during commissioning can be exploited.

The Answer is Hiding in the Data

It should be apparent from the discussion above that good data is not only helpful in the execution of a corporate energy management strategy, it is essential. Without a rich and accurate historical archive of your business operation you will be forced to make gross assumptions that will minimize the benefits of your strategy. Not only will the potential benefits be minimized, there is a risk of making changes that will actually hurt, not help the company’s energy position. This is because the game of energy management is a game of inches, not feet.

Energy engineers for the last hundred years have been incrementally improving energy technology to squeeze out every bit of efficiency from systems. As a result, there will be few easy “wins” in implementing a corporate energy management strategy. To identify performance improvement opportunities will require engineers and analysts to mine large volumes of historical operating and load profile data. This baseline performance data will then need to be compared with equipment design performance to identify improvement opportunities.



In addition, real-time operating data will be needed to evaluate which programs are having the greatest impact and for fine tuning the programs. Again, it is critical that the right people in the organization are armed with an enterprise view of operational, asset, and financial data. This data will equip them to identify opportunities and make timely business decisions. Without a real-time performance management platform, your employees will be severely limited in carrying out the directives of your energy management strategy.

Thinking Outside the Box

Technology and innovative thinking are the engine for securing the corporation's energy future. Many information technology tools are available in the marketplace to help us mine our corporate data, find previously undetected relationships, and continuously improve our processes and production performance.

One way of achieving incremental improvement in our energy supply and use is to leverage our existing applications in new ways. For example, during my stint as energy manager of a large US power company, we began to explore new ways of using our real-time performance management system from OSIsoft, Inc. to identify performance improvement opportunities in our equipment. Due to electric market oversupply conditions, our equipment never ran the way it was designed to operate. Instead of running our equipment in a steady-state, base-loaded operating configuration consistent with the design specifications, the market dictated we run in a cycling, part-load operating mode. As a result, traditional performance monitoring and performance prediction software no longer worked properly.

We were forced to throw out traditional methods and tools and use our plant PI System data to generate empirical models of our plant performance. Armed with this asset performance data, we designed performance improvement initiatives around benchmarking best-in-class operating performance. We then built PI applications and rolled them out to the entire fleet to assist operators in achieving optimal performance.

The benefit? Thinking “outside-the-box” and leveraging our real-time performance management platform resulted in \$50 million of fuel savings over a two year time period.

The Right People and the Right Technology

Doing without, or delegating a corporate energy management strategy to others, is no longer an acceptable option in today's energy markets – the risks are too great. Senior management must forge the corporation's long-term energy and environmental strategy. Once the strategy is developed, it must be executed. It has been my experience that the primary “fuel” for this strategy engine is data—accurate, timely, data in the right hands, of the right people in the organization.



Technology has gotten us into this problem and technology will help us find our way out of it. The fuel for technology is data and innovation. Data that is applied within a specific context is transformed into information, and information in the hands of subject-matter-experts becomes knowledge. Knowledge workers finding solutions to our problems are an important component of providing energy security to your company's future. The first step, however, is for business leaders to formulate an energy management strategy to secure reliable, reasonably priced energy for their company's future.

About OSIsoft

OSIsoft® (www.osisoft.com) delivers the PI System, the industry standard in enterprise historians, as the core of its real-time infrastructure platform. A global base of more than 11,000 installations across manufacturing, energy, utilities, life sciences and other process industries relies upon the OSIsoft PI System to safeguard data and deliver enterprise-wide visibility into operational health in order to manage assets, mitigate risks, and identify new market opportunities.

Founded in 1980, OSIsoft, Inc. is headquartered in San Leandro, Calif., with operations worldwide and is privately held.