

Going Green Doesn't Have to be Sexy

Michael E. Mayher

Lakeland Community College

Michael E. Mayher

Lakeland Community College

7700 Clocktower Drive

Kirtland, Ohio 44094

Phone: 440-525-7255

E-mail Address: mmayher@lakelandcc.edu

Abstract

Lakeland Community College in Kirtland, Ohio is recognized for its energy conservation and sustainability leadership in Ohio and nationally. The College's best practice submission details the practical, incremental approach taken in Lakeland's "Energy Journey." Against a backdrop of energy price uncertainties, increasing concerns over grid reliability, and the climate change impacts of human use of energy, College leadership recognized the critical importance of looking at energy use more strategically. That journey, which addresses the financial challenges of energy dependence, recently resulted in a sustainable, one-year reduction of 40% in the College's energy use and greenhouse gas footprint. Our practical approach, and resulting success, is a model that other colleges now follow. This best practice submission provides an in-depth look into the actions and short timeframe needed to turn around the energy future of a college campus.

Introduction of the Organization

Lakeland Community College (Lakeland) is located in Kirtland, Ohio and offers both credit and non-credit instruction. Of the 23 two-year public colleges in the State of Ohio, Lakeland is the seventh largest. The College was established in 1967, and awarded its first degrees in 1969. The College's primary service area is Lake County, Ohio, but Lakeland also attracts students from three surrounding counties. Lakeland is a nonresidential institution. Unduplicated Fall 2009 credit headcount enrolled 9,612 students, representing 5,930 full-time equivalents. Annual unduplicated non-credit headcount approximates 12,000 students.

Today, Lakeland's main campus consists of 392 acres of land with 13 major buildings, representing 651,883 gross square feet of space. The College operates year-round, seven days per week.

Statement (Restatement) of the Problem / Initiative

This "best practice" addresses the financial challenges of energy dependence that Lakeland faces. Behind compensation, energy consumption is Lakeland's next highest annual operating cost. In FY 2008, the College's annual energy spend approximated \$1.7 million, representing 3% of its annual operating budget, with the substantial majority of those costs dedicated to electricity and natural gas. From an environmental standpoint, Lakeland was also annually responsible for the generation of 13,787 metric tons of carbon dioxide (mtCO₂) from its direct use of natural gas and indirect consumption of electricity (generated by that local utility).

Against a backdrop of energy price uncertainties, increasing concerns over grid reliability, and the climate change impacts of human use of energy, Lakeland leadership in 2005 recognized the importance of strategically looking at energy use. Our primary concerns were focused on a 20-year prospective assessment of: (a) the globalization of energy prices; (b) the

significant energy demands occurring and projected from highly-populated, developing to industrial developing economies (China, India, Indonesia, Brazil); and (c) the planet's limited supply of fossil fuels (which currently accounts for 85% of global energy use).

Design

To face what the College believes is a critical energy challenge, Lakeland developed its "Feasibility Assessment and Integrated Energy Master Plan" in 2006. This assessment was carried out by a team of College leadership and staff working with architectural, business, and energy experts from both the USA and Europe. This approach was unique in benchmarking Lakeland's campus against European best energy practices, as well as developing preliminary engineered energy solutions that were financially modeled and determined as economically sound. These efforts provided the College with a roadmap to follow for the next 20 years with the intent to lower energy consumption, as well as reduce its direct and indirect creation of greenhouse gases, by 60%.

College leadership and staff in facilities management and the finance offices were involved in this effort. Independent outside expertise for this project was led by Garforth International llc (Garforth), along with MVV Energie Group (Mannheim, Germany), Owens Corning, and The Collaborative Inc. The process involved:

- Extensively evaluating the College's energy use and benchmarking it against best practices of Austrian higher education institutions (due to the comparable climate of Austria to northeast Ohio);
- Identifying Lakeland's energy weaknesses from those benchmarking efforts which now became an opportunity for implementing significant energy conservation measures; and

- Performing a twenty-year investment assessment in evaluating a variety of energy efficiency opportunities to specific, prioritized recommendations.

The College's "Feasibility Assessment and Integrated Energy Master Plan" identified that if Lakeland implemented roughly \$6 to \$8 million of specific energy conservation measures into its facilities, then it would: (a) reduce its energy consumption and greenhouse gases by an astounding 60% over the next 20 years; (b) significantly improve its cash flow (via a net present value analysis), and (c) yield at least a 15% internal rate of return for these efforts after considering low energy inflation forecasts.

Lakeland's board of trustees and president were champions of this process from its inception and the trustees accepted the "Feasibility Assessment and Integrated Energy Master Plan." It was subsequently codified into a living strategy and tactical goals that tie into Lakeland's energy demand and supply side practices, and their related funding decisions. These efforts created an implementation roadmap with three different stages.

Stage 1: Gain immediate control of energy consumption on the college's main campus by:

(a) consolidating a number of separate energy islands into a single heating and cooling network that would eliminate excess energy use and be a platform for new energy sources and its rational management; and (b) installing an open architecture building management system that can effectively schedule energy use in every College building by zone as well as down to the level of individual classrooms or offices.

Stage 2: Implement a number of ongoing efficiency improvements ranging from the upgrade of boilers and chillers to roof repair and re-insulation.

Stage 3: Evaluate supply alternatives with a focus of ensuring the economic feasibility of implementing any alternative energy sources.

This roadmap keeps the College focused to not only be good stewards of the environment, but also to control costs in a significant area that impacts Lakeland's tuition pricing and access strategy.

During 2005 and 2006, the College dedicated roughly 500 hours of leadership and staff time to develop its "Feasibility Assessment and Integrated Energy Master Plan." Additionally, outside fees to the Garforth team were substantially discounted since Lakeland served as a pilot for Garforth to enter in to the higher education market; these fees approximated \$50,000.

Implementation

Since acceptance of the College's 2006 "Feasibility Assessment and Integrated Energy Master Plan," to-date efforts encompass: (a) the comprehensive procurement and implementation of energy conservation measures through a competitive process with Energy Savings Companies (ESCOs), and (b) a continuum of implementing other energy saving measures in our facilities and operations.

Lakeland utilized Ohio public higher education energy laws to competitively procure the design and build of a comprehensive set of energy conservation measures (ECMs). The objective of this process was to implement the College's Stage 1 requirements and any viable energy conservation opportunities identified in Stage 2. Development of a comprehensive Request for Proposal (RFP) occurred in late 2007 and early 2008, solicitation of that RFP commenced January 2008. Selection of, negotiations with, and awarding contract to an ESCO (SIEMENS) took place by early June, 2008, and construction / implementation of a comprehensive set of ECMs concluded during the Summer 2009.

The College believes several actions interspersed in the RFP development and selection process significantly contributed to the success of the implementation. These actions were made after initially spending several months talking with other public colleges and universities and learning from their experiences. First, we retained Garforth to act as Lakeland's "conscience" as a means to ensure we followed our energy roadmap. Second, we hired Facilities Management Concepts, Inc. (FMCI), an independent energy engineering firm, to assist in the proposal development and award process. Third, we collaborated with the State of Ohio Attorney General's Office in the upfront development of a comprehensive Request for Proposal (RFP) document that now serves as the template for all Ohio public colleges and universities. The RFP formally states the contractual terms and conditions that the ESCOs must adhere to in their performance, including an annual volume based energy savings guarantee backed by a performance bond.

Lakeland's comprehensive energy contract was awarded to SIEMENS because they not only demonstrated the best understanding the College's energy objectives, but also helped Lakeland exceed our short-term as well as state-legislated energy reduction goals. Throughout the twelve-month construction phase, FMCI was retained to monitor SIEMENS's contract implementation, and is subsequently used to validate the College's energy performance and guarantee. The SIEMENS contract was an award of \$6.3 million and represented a capital outlay of \$9.60 per gross square foot of main campus space. ECMs implemented under the SIEMENS contract were the fulfillment of the College's Stage 1 requirements, as well as a large number of other Stage 2 ECMs (lighting and controls, substantial upgrades to heating and cooling equipment, water conservation, and building weatherization improvements).

Lakeland financed the SIEMENS award by issuing its Series 2008 tax anticipation notes, with a final maturity of ten years, and an all-in effective borrowing cost of 3.69 %.

In addition to the SIEMENS contract, since 2007 Lakeland has implemented a continuum of other energy saving measures in our facilities and operations. One major initiative was to significantly upgrade the energy conservation capabilities of our roofs during scheduled renovations. The College renovated 54,000 square feet of roofing during 2007- 2009. In that process, and for minimal additional cost, we required those contractors to significantly increase the insulation in those roofs (above Ohio building codes), as well as enhance the energy performance by adding either “green” features or solar reflective roof coatings. Other ECMs implemented since 2007 range from installing energy misers on all vending machines, to buying only ENERGY STAR-rated electronics and appliances, as well as integrating virtual servers in the College’s data center.

Benefits

Lakeland has and continues to significantly benefit from its energy journey.

The College’s comprehensive energy conservation project with SIEMENS resulted in the College achieving guaranteed, sustainable reductions in natural gas by 46.0%, electricity by 36.1%, and water by 17.5%, and a reduction in direct and indirect creation of greenhouse gases of 40.0%. Effective July 1, 2009, this translates to Lakeland receiving an annual energy reduction guarantee of \$556,281 from SIEMENS which is backed by a performance bond. Additionally, the College receives a \$222,724 annual benefit from other operating savings and future avoided capital costs. Based on its guaranteed energy savings, as well as operating savings and future avoided capital costs, the \$6.3 million SIEMENS award provided Lakeland with a simple payback in a short 8.6 years.

College initiatives in implementing other ECMs since 2007 will account for an additional 1.3% reduction in electric and natural gas consumption, and roughly an additional reduction of 1.0% in our greenhouse gas footprint.

Because of Lakeland's unique approach in developing its "Feasibility Assessment and Integrated Energy Master Plan," the College co-chaired a task force during 2007 in the development of State of Ohio mandated energy conservation goals for public higher education. In 2008, Lakeland also contributed to revisions in Ohio law that better promoted public higher education's financing of energy conservation projects.

Since the start of its energy journey, Lakeland's chief business officer and chief academic officer and their staffs have collaborated to promote and focus energy efforts into the curriculum. The College supports a strong Applied Nuclear Engineering Technology program, and has promoted education and training in various credit and non credit programs to support a green economy.

Lakeland is currently using a similar approach in addressing sustainability. The College is a member of the Association for the Advancement of Sustainability in Higher Education (AAHSE), and expects to register as a charter participant of AAHSE's Sustainability Tracking, Assessment & Rating System (STARS).

The College's energy journey is or will be featured in two film documentaries: first, as an operational best practice currently showcased through Buildipedia.com; and second, in an upcoming PBS special that will be broadcast during Earth Week titled, "Growing Greener Schools."

The College's "Feasibility Assessment and Integrated Energy Master Plan" has already been replicated by several community colleges in the State of Ohio and we understand these also

indicate great energy savings opportunities. It is expected to be piloted with the State of California's public higher education system, and is under consideration with private higher education in the State of Pennsylvania through the State Treasurer's Office.

Retrospect

In hindsight, Lakeland Community College should have started its energy journey years earlier. Lakeland's to-date energy efforts and outstanding results beg us to continue rethinking how the College approaches its other business and operations practices.