

## Lake Land College

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Contact:  
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| <b>VISION</b>         | Holistic Approach to Promote Self-Sustainability and to be a Leader in Environmental Stewardship                            |
| <b>GOAL</b>           | Reduce Energy Consumption, Strive Towards Carbon Neutrality, Replace 35 Year Old Deteriorating Infrastructure Across Campus |
| <b>PROJECT TYPE</b>   | 5 Phase/5 Year Capital Life Cycle Infrastructure Master Plan                                                                |
| <b>ANNUAL SAVINGS</b> | Over \$100,000 in Energy Costs and 400 Metric Tons of CO <sub>2</sub>                                                       |



*"Lake Land College selected CTS as our long term business partner to help make our vision of self-sustainability and environmental stewardship a reality. Our goal was to reduce energy consumption, and to strive toward carbon neutrality while replacing a 35 year old deteriorating infrastructure across campus. We selected CTS based on their unique approach to a campus wide geothermal system, offerings in solar and wind energy, and creating educational opportunities for our students. We have already exceeded projected energy savings while making major renovations to support our education departments and curriculum. Without hesitation, I encourage anyone that is considering building renovations or strategic energy initiatives to consider the CTS Group."*  
— Ray Rieck, Vice President of Business Services

**Background:** Founded in 1966, Lake Land College is a public community college serving residents of 15 counties in a 4,000 sq. mi. area in East Central Illinois, with a population of 203,000. The 308 acre campus hosts nine major buildings plus six support buildings, 2 campus ponds, a 160 acre agriculture land laboratory, computer labs, CAD lab, child care lab, cosmetology and dental clinics.

**Vision:** LLC took the opportunity presented by aging infrastructure to make environmentally smart decisions as original equipment and systems neared the end of their useful life. The college's effort to become self-sustaining was shaped by three primary goals:

- / Reduce energy consumption, counteract rising energy demand and upgrade heating, cooling, lighting and control campus wide.
- / Modernize aging facilities dating to 1968 without disrupting college operations.
- / Model best practices and serve as a laboratory for the college's new renewable energy curriculum, preparing students for the rapid growth in "green jobs" in Illinois.

**Challenges:** The College's discovery process led them to seek a long-term solution in light of fast-rising energy costs. Geothermal energy was one of the alternative systems of interest to LLC, but national companies which they consulted said it could not be done on the College's scale. LLC also wanted a turnkey solution with guaranteed performance to avoid the hidden costs of growing its own permanent staff.

**Solution:** The project parameters led the LLC team to CTS for expertise with infrastructure management programs and alternative energy solutions for public entities. As partners, Lake Land College and CTS are dedicated to the College's commitment to a greener and cleaner education and environment. This is being accomplished through a multi-year plan to create a replicable energy control system that generates energy while reducing consumption. The holistic approach uses geothermal, solar, and wind energy, while creating educational opportunities for students.

A 5 phase/5 year Capital Life Cycle Infrastructure Master Plan was developed utilizing alternative energy systems as follows:

**Geothermal - Solar - Energy Efficiency Measures:** A 12 inch diameter geothermal pump diversification loop was completed running 3,000 ft. around the perimeter of the campus. The loop allows for load diversification and provides flexibility for locating future well fields. Initially 140 new geothermal wells were added to the system to serve the Field House and Vo-Tech buildings. This well field generates the



Well Field After Completion and Solar Collectors for Domestic Hot Water

first 240 tons of what will grow to generate 1,200 tons, or 75% of the required condenser capacity of the campus. Further modifications to the power plant and geothermal loop were made bringing additional campus facilities on line.

- / Air Conditioning: The Field House and Vo-Tech buildings, both built without air conditioning, gained cooling by being added to the geothermal system without any rise in carbon producing energy demand.
- / Solar Hot Water: Installation of 10 solar energy panels on top of the Field House to power the closed loop solar domestic water heating system. The solar heated water now provides the needs of the high demand uses of the Field House.
- / Energy Efficient Lighting: New T-8 fluorescent lighting and motion sensors were added throughout campus to dramatically cut energy use.
- / Interior Renovations: Classrooms and hallways were abated of asbestos and retrofitted with new acoustical ceilings, painting, carpeting. Bathrooms were also renovated.

**Wind Energy:** With the initiative of “Envision.Educate.Engage,” LLC is now developing and installing a wind turbine system which will play a major role in their goal of being energy neutral. Wind power will generate electricity for lights and HVAC systems to offset electricity that would otherwise be purchased from the local utility. While there are many wind turbine systems in operation, the LLC system is unique in that it utilizes 100kW super turbines which can produce more energy at lower wind speeds than standard 100kW turbines. The result is more energy with fewer

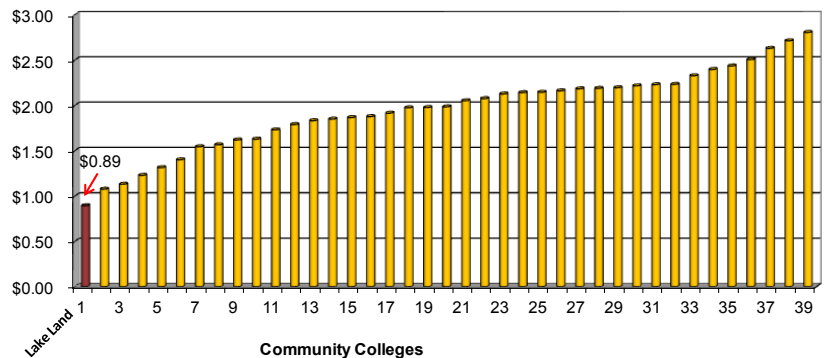
turbines making these systems very attractive. These turbines can be used much more economically in areas of lower wind speeds where the standard 100kW turbines are not logical.

**Curriculum:** The College currently offers two courses in the sustainability field and just received a grant for state-of-the-art equipment and materials to provide students with hands-on learning in emerging Green Job Technology fields such as building, retrofitting, solar and wind power, and smart grid technologies. The wind turbines will also allow the College to develop a learning lab for students.

### Results - Lowest Utility Costs for Illinois Community Colleges:

The college is already experiencing savings beyond projections. Facing an aging infrastructure, rising utility costs and new construction, college officials took a risk and set a goal of creating the largest geothermal well field, utilizing other energy generation sources and finding solutions to reduce energy consumption. It's working! Prior to 2008, the college's carbon footprint emitted 6,500 tons annually. Since the Envision.Educate.Engage Initiative, Lake Land's saved 400 tons of carbon dioxide per year and is saving more than \$100,000 a year in utility costs.

Utility Costs per Square Foot



**Funding:** The \$20 Million renovations will be phased over 5 years. CTS has provided grant assistance to help provide project funding. The college has thus far been awarded the following grants:

- \$280,000 - ARRA Thermal Efficiency Program – IL DCEO
- \$500,000 - ARRA Community Renewable Energy Program
- \$1,332,100 - US Department of Energy

**Strengthening the Local Economy:** Through the use of local contractors and labor on the project, it is estimated that \$59 million of new spending resulted in the local community, and up to 496 jobs have been created or maintained\*. So not only has the project reduced the carbon footprint on the environment, it has also helped local families and businesses remain strong.

*\*Bureau of Economic Analysis, Department of Commerce, RIMS II Multipliers. Estimated \$3 million of new spending in the local community, as well as up to 26 new jobs created or maintained for every \$1 of work implemented.*