CASE STUDY

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Lake Land College

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Mattoon, Illinois
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By 2012, CTS' work will save Lake Land College about 850,000 kilowatt hours (kWh) of electricity for a carbon reduction of 556 metric tons annually, and nearly 70,000 therms of natural gas each year.

Fast Facts:

- $19.7 Million Four-Phase 5 year Capital Life Cycle Infrastructure Master Plan Utilizing Alternative Energy Systems.
- The College's carbon reducing vision will include Geothermal Heating and Cooling / Solar Energy / Wind Energy.
- Lake Land College will join a handful of colleges and universities nationwide to utilize clean, renewable wind generated power.
- Curriculum will incorporate a renewable energy curriculum preparing students for the rapid growth in "green jobs" projected for Illinois.

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:

1. Reduce energy consumption, counteract rising energy demand and upgrade heating, cooling, lighting and control campus wide.
2. Modernize aging facilities dating to 1968 without disrupting college operations.
3. 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. A four-phase 5 year Capital Life Cycle Infrastructure Master Plan was developed utilizing alternative energy systems as follows:

- **Phase 1 - 2008:**
  - **Geothermal System:** In 84 days during the 2008 summer break, 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. 140 new geothermal wells were added to the system to serve the Field House and Vo-Tech buildings. This well field will generate the first 240 tons of what will grow to generate 1,200 tons, or 75% of the required condenser capacity of the campus.

Well Field Drilling

Completed Well Field

Mechanical Equipment

- **Phase 1 Continued:**

  - **Air Conditioning:** The Field House and Vo-Tech buildings, both built without air conditioning, gained cooling by being added to the geothermal systems 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 in the Field House and Vo-Tech buildings 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.

- **Phase 2 – 2009:** The capital improvement master plan continues with energy efficient renovations at the Northwest Building.

- **Phase 3 – 2010:** The Learning Resource Center receives renovations and energy efficient upgrades.

- **Phase 4:** The project will continue with renovations to Webb Hall, Northeast Classroom Building, further modifications to the power plant, and wind energy harvesting.

  - **Wind Energy:** Wind power will generate electricity for lights and HVAC systems to offset electricity that would otherwise be purchased from the local utility. CTS proposed and will install a total of 4 wind turbines that will operate at wind speeds averaging 12.5 to 14.5 mph which are typical wind speeds to the Mattoon, Illinois region. About 80% of the US experiences this type of wind speed.

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

In addition, CTS will administrate the sale of Renewable Energy Certificates (RECs) to generate additional revenue of $28,000 annually for the College. RECs are tradable attributes associated with power generated or conserved through renewable energy initiatives like solar, wind and bio-fuel.

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