



Report: Campuses Tapping Into Benefits of Geothermal Energy, Cutting Costs

U.S. Colleges and Universities Could Save Billions on Energy, Reduce Carbon Footprint

Reston, VA (February 25, 2011) - Today, the National Wildlife Federation and partners released a first-of-its kind report, [*Going Underground on Campus: Tapping the Earth for Clean, Efficient Heating and Cooling*](#). Documenting more than 160 colleges and universities in 42 states, the report illustrates how campuses are tapping into the benefits of geothermal energy and underground architecture to cut energy use for heating and cooling by 30 to 70 %, while substantially reducing greenhouse gas pollution.

The nation's 4,100 two- and four-year colleges and universities, which spend more than \$20 billion each year on energy (\$5 million per campus on average), could collectively save between \$2-7 billion in energy costs and cut the nation's carbon footprint by up to one percent annually by using geothermal technologies for the majority of heated and cooled space. The stakes for colleges and universities are considerable; the University of Illinois alone spends approximately \$100 million annually on energy. Energy costs at the University of Wisconsin-Madison spiked 77% between 2001 and 2006, even though square footage rose by only 7% during that time.

“We launched this initiative because we’re motivated to help the campuses we work with across the U.S. figure out how to significantly cut greenhouse gas pollution, energy use and costs,” says Julian Keniry, director of Campus Ecology at National Wildlife Federation. “Buildings are the largest energy users on most campuses, yet few clean, renewable energy systems can compete as affordably or sustainably as geothermal systems, specifically for heating and cooling, which account for 40-50% of a building’s total energy costs and pollution.”

Ball State University, in Muncie, IN, anticipates net annual savings of \$2 million and an estimated 50% reduction in greenhouse gas pollution by using a network system of geothermal heat pumps in place of worn-out coal-fired boilers to heat and cool 45 buildings. Furthermore, says Professor Robert J. Koester, author of the foreword to the study, “[B]ecause of the scale of this geothermal system and the fact that it is integrated into the entire campus building stock, we will be able to effectively trade energy from one building to another.”

The report examines five types of geothermal systems in place on U.S. campuses, including ground-source heat pumps, the most commonly used technology, and direct geothermal, aquifer thermal energy storage, lake-source cooling, and geothermal electricity. Also featured in the

report is the first-ever review of underground or earth-integrated buildings on campus, with many case examples.

Written by Stan Cross, education director at Warren Wilson College, David J. Eagan, outreach specialist at the University of Wisconsin-Madison, and Paul Tolmé, environment, science, and outdoors writer, and others, the report is published by National Wildlife Federation's Campus Ecology Program in partnership with GEO, the non-profit trade association of the geothermal heat pump industry, the Geothermal Energy Association (GEA), and APPA: Leadership in Educational Facilities, along with Jobs for the Future and the Energy Action Coalition. It is funded in part by generous support from The Kendeda Fund.

None of the findings are news to the geothermal industry. "Geothermal systems of all kinds are reducing our reliance on non-renewable or less safe sources, and yielding a good return on investment for colleges and universities," notes John Kelly, executive director of GEO. "[T]his report shows there is far more promise for geothermal systems on campuses than has been tapped to date."

"It is fitting that Yale University's Kroon Hall, which uses a geothermal heat pump system and solar panels, stands in place of the fossil fuel burning Pierson-Sage power plant; we would like to see that story multiplied thousands of times to realize the true potential of geothermal at campuses and schools," says Karl Gawell, executive director of the GEA.

In addition to energy and cost savings, the report documents a variety of other benefits, including enhanced comfort and educational value and the creation of good, new jobs.

At the University of Illinois-Chicago's Grant Hall, for example, the new geothermal heat pump system has made it easier to maintain a consistent temperature of 72 degrees Fahrenheit year-round and has reduced complaints about inconsistent temperatures.

During a scorching summer in 2008, when temperatures topped 100 degrees for 16 days, the Ezell Center at Lipscomb University, which uses geothermal heat pumps, was one of the coolest buildings on campus.

Investment in geothermal systems also yields educational and career benefits. GEO expects 1 million new geothermal heat pump installations by 2017 will create 100,000 new jobs, many of which will require degrees or credentials from two- or four-year colleges and universities. Jobs in geothermal are predicted to multiply faster than most occupations over 2008-2018.

"Geothermal energy will not only create more jobs than conventional fossil fuel technologies, it will create better paid and longer-term positions," says Gawell.

"This is good news for lower skilled and displaced adults in this tough economy," says Gloria Mwase, project director with Jobs for the Future, which has worked for more than 25 years to successfully create career pathways for lower skilled adults in diverse sectors from health care to construction. "The report strongly supports the work that JFF and NWF has done with the Greenforce Initiative, where we work with community colleges to advance green career education and training. Geo-thermal jobs have great potential for helping lower-skilled adults

transition to family-sustaining careers. As more colleges and universities adopt geo-thermal systems, we hope to see greater emphasis on using these systems as "learning laboratories" in their education and training programs."

A webinar to release the report and share findings was held on Thursday, February 24, 2011 at 2:00pm ET

Julian Keniry of NWF and Stan Cross of Warren Wilson College were the moderators, and the conference features speakers from 2 universities with geothermal installations, representatives from GEA and GEO, and Loretta Hall, author of Subsurface Buildings (subsurfacebuildings.com). A recorded version of the webinar is available online. For more information about the National Wildlife Federation's Campus Ecology Program, the Greenforce Initiative and a free copy of the report, go to www.nwf.org/campusecology.

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