

## Geoexchange Can Ease the Power Supply Problem

To the operators sitting in front of computer screens showing the demand for power across their region, it's an all-too-familiar scenario. As a new day begins, people all over the world wake up to alarm clocks and radios. They turn on lights, coffee makers, televisions. They reach for telephones, cell phones, pagers, computers, modems, printers. For comfort, people turn on heating and air conditioning systems.

Meanwhile, office buildings, retail stores, restaurants and factories turn on lights, heating and cooling systems and manufacturing equipment. And through it all, demand for power spikes up.

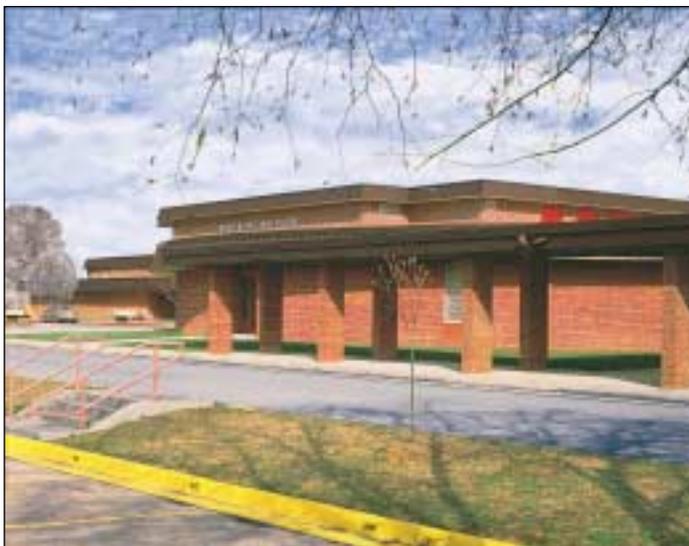
The operators start cranking up the output from their generating stations, then bringing more generation on-line. The afternoon wears on and the operators start buying additional power from other regions on the grid, to the extent it's available. But the line on the screen that represents demand for electricity keeps creeping ever closer to the line that shows the total power available. If the lines cross, a crisis is inevitable.

In the electric utility business, the suddenly increasing electrical load is called peak demand. And the perennial

question for the operators in this situation is: Will they be able to find enough supply to satisfy the demand?

By 2020, the nation's energy demand will have increased by 32 percent, while during the same time 27 percent of the nation's power plants will be going off-line. Clearly, the supply for power can not meet the demand. Meanwhile, many states in the nation will be forced to endure rolling blackouts, a concept that has become all too familiar to Californians. A rolling blackout is nothing more than a way to force everyone in an area to share in reducing peak demand. The number of homes and commercial buildings affected at any one time by a rolling blackout is determined simply by comparing the amount of electricity needed to the total amount available, and then shutting down enough homes and businesses to eliminate the difference.

There are, however, other ways to reduce energy demand — and geoexchange is one of them. Heating and cooling accounts for more than 30 percent of a building's energy costs. For that reason, technologies that reduce HVAC energy consumption provide a more substantial savings. Because geoexchange is so efficient, it helps reduce peak demand significantly. In fact, each ton of standard air conditioning that's replaced by



*More than 650 schools in 39 states are using geoexchange for their heating and cooling needs. These schools are saving more than \$16 million in energy and maintenance costs each year and will reduce annual carbon dioxide emissions by about 230 million pounds — the equivalent of removing 28,000 cars from our nation's highways.*

*Continued from page 1*

## Geoexchange and Power Supply

geoexchange reduces peak electrical demand by about 0.8 to 1.2 kilowatts (kW). Since an average home uses about 2.5 to 5 tons of air conditioning, that's 2.0 to 6.0 kW per house.



*Each year, more offices and commercial buildings save tens of thousands of dollars on heating and cooling costs through geoexchange. The technology not only lowers utility costs but it also saves space, lowers maintenance and equipment life cycle costs and offers individual zone control*

To put that in perspective, if just one million (less than 1 percent) of the 102,830,000 occupied housing units across the country with central air conditioning were to install geoexchange systems for cooling and heating, we could save 7 to 10 billion kilowatt-hours of electricity and avoid building 8 to 12 new 300 MW power plants.

Further, geoexchange provides heating just as efficiently as it provides cooling and burns no fossil fuels in the process, which means we avoid producing 5.84 billion pounds of carbon dioxide. That's the equivalent of planting 796,400 acres of trees. According to the recently published National Academy of Sciences Climate

Change Report, "carbon dioxide is probably the most important climate forcing agent today." Carbon dioxide emissions significantly contribute to the increase in greenhouse gases, which promote global warming. Further, it's estimated that 85 percent of greenhouse gases come from energy usage.

With the nation's energy crisis on the front burner, the energy efficiency and environmental friendliness of geoexchange make it a logical choice to help ease the nation's demand for power. Throughout the country, the nation has underinvested in energy structure. California alone has seen a 25 percent increase in energy demand and has not built a power plant for more than ten years. By using the earth's natural temperature as an energy source, geoexchange can be used to comfortably heat and cool homes, office buildings, schools and more — and it is a proven technology that can be used right now to help alleviate our energy demands. •

## Geoexchange By the Numbers

- Putting a geoexchange system in a typical home is the equivalent, in greenhouse gas reduction, of taking two cars off the road or planting an acre of trees.
- Current geoexchange installations reduce our need for fossil fuels by more than 11 million barrels of crude oil per year.
- If just one in twelve California households would convert to geoexchange heating and cooling, the energy savings would be the equivalent of building nine new 300 megawatt power plants.

## A Blend of Past and Future in Richardson House

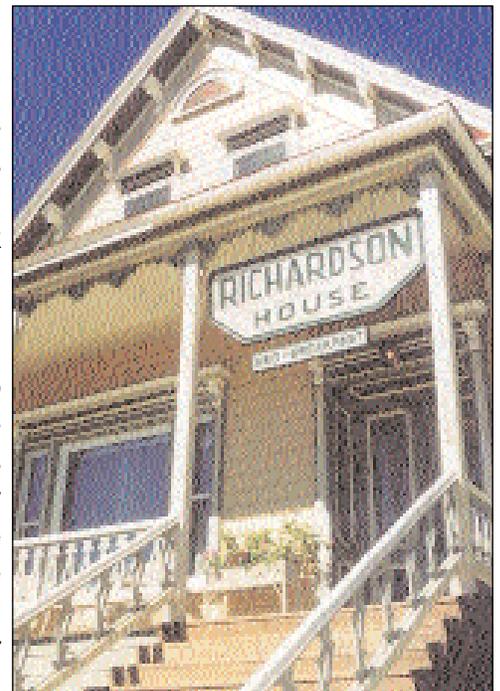
It was the greatest peacetime migration in history. More than 200,000 people followed the Humboldt River as they traversed Nevada in hopes of a new start in the new land — California. In 1844 the first settlers survived the arid, sparse course through Nevada to build lives in the Truckee area of California. A hard living western railroad town, Truckee attracted Warren and George Richardson in 1874. Imaginative by nature, the brothers invented a steam engine to move lumbered logs and a method to expedite log handling. These two inventions, along with others, made the brothers two of the wealthiest men this side of the Sierra.

With his earnings, Warren Richardson built a Victorian home in 1887. The house remained in the family for 53 years, until Warren's granddaughter sold the home in 1940. Over the years the house was used as a residence, boarding house and even a flophouse in the 1960s. In 1981 the house made its debut as a bed and breakfast and in 1987 Jim Beck purchased it to create the Richardson House Bed & Breakfast Inn.

"The house was renovated in the late 1990s," said Patty Zwiers, Richardson's innkeeper. "They literally lifted the house off the ground to add a basement. And, at that time they added a new heating and cooling system." That system was geexchange. Jim and the contractors working on the project became familiar with geexchange technology thanks to a series of advertisements and newsletter articles from the Truckee Donner Public Utilities District (PUD). "In the case of the Richardson House, the owner had seen one of our newsletters," said Scott Terrell, Truckee Donner PUD. "At that time, we were soliciting for participants for a pilot program, which provided a donated heat pump."

The 5,000-sq. ft. Richardson House uses an eight-ton geexchange system and eight wells each drilled 150-ft. deep. Since the Richardson House was a participant in the pilot program, Truckee Donner PUD monitored the system after it was installed in 1995 to determine its energy efficiency. It found that heating the building cost two cents per square foot in the winter months. "Truckee is sometimes considered the coldest place in the nation. The town is right in the Sierra Nevada Mountains and as a result we get a lot of snow and cold weather. To heat a home of this size in this climate for less than \$100 a month is pretty incredible," said Terrell. Not only is it efficient but it's also "very comfortable," according to Zwiers.

Comfort is of course one of the key elements of the Richardson House. The inn's eight rooms are each meticulously decorated with elegant 19th and 20th century antiques. Within walking distance from historic downtown Truckee, the Richardson House is a popular destination for skiers and hikers visiting nearby Donner Lake and Lake Tahoe. With the splendor of the Sierra Nevada mountains nearby, it's no wonder more than 200,000 people migrated to this part of the country so many years ago. •



*The 5,000-sq. ft. Richardson House is heated and cooled by geexchange for less than \$100 a month by using geexchange. The bed & breakfast has reduced electricity demand by saving more than 7 kilowatts of electricity.*

## Peace and Quiet at Feather River College

**P**erched on a mountainside, Feather River College borders Plumas National Forest in Quincy, CA. The community college's 256-acre campus hosts a variety of wildlife including a trout hatchery and an equestrian center with horse boarding facilities. With this natural world as a backdrop, the college notes that it is truly tucked away in one of California's quiet spots.

And while nature's charm is certainly part of the allure of Feather River College, the alpine climate, with its extreme ambient temperatures in both summer and winter, can make heating and cooling a difficult and expensive proposition. Combine the effects of climate with the college's historic reliance on a combination of out-dated heating and cooling equipment and the result was a huge energy problem for the college. In fact, space conditioning accounted for approximately 65 percent of the college's energy costs — an estimated \$200 per student added to Feather River College's annual operating budget.



*The geexchange system at Feather River College saved more than \$50,000 in just 18 months after its installation. The college chose geexchange in part because its energy efficiency fit with Feather River's own natural setting. Their use of geexchange has reduced electricity demand by 118 kilowatts.*

Looking for ways to cut these costs, the college joined forces with the Princeton Development Corporation, which is a part of the Princeton Energy Group, an international group of environmentalists and energy developers specializing in renewable energy and energy efficient resources. Princeton worked with the San Francisco engineering firm Guttman & Blaevoet, the California Energy Commission, Pacific Gas & Electric (PG&E) and the GHPC to design a geexchange system for the college.

Impressed by the energy savings that could be achieved with geexchange, Feather River College agreed to install the system to heat and cool four buildings. The 135-ton system relies on 24 individual heat pumps strategically located throughout the buildings, which allow separate areas to be heated and/or cooled individually, depending on need. Two of the buildings required a horizontal loop system with 20 trenches, 295-ft. long and 5-ft. deep. The other two buildings use a vertical loop system with 56 boreholes, drilled 115-120-ft. deep.

In just 18 months after completion of the project, the geexchange system saved the college more than \$50,000 — about \$6,000 more than projected. "It's even more efficient than the engineers told us it would be," said Ron Groh, Feather River College's assistant superintendent of business services. Not only has geexchange delivered comfort at a reduced cost but it also fits in with its tranquil setting. "The system has been much quieter than our old system," said Groh. "That's really important to us in Feather River's educational environment." •

## Silver Rose Winery Toasts Georexchange

The Silver Rose Winery in Calistoga, CA, located in the heart of wine country, is a breathtaking natural beauty. Visitors to this winery, conference center, inn and spa roam acres of vineyards nestled between mountains, dine in a restaurant within a cozy knoll and admire the grounds' centerpiece — a beautiful man-made pond.

But what they probably don't realize is that the pond is more than just something to be admired. It is actually the driving force behind the facility's georexchange system, helping to keep the conference center and winery at a comfortable temperature, and also assisting in the wine fermentation process.

It was the pond that first caught the eye of Mike Ericksen, of Earth Energy Systems, Inc. Ericksen, a resident of the area, noticed that the winery was adding a new facility. He immediately called on J-Paul Dumont, owner of Silver Rose, to discuss georexchange's benefits with him.

"In addition to the substantial savings in operation, I told him the georexchange system is environmentally sound," Ericksen said. "I also said that the system could be installed entirely indoors — as opposed to traditional systems whose equipment would intrude on the outside of the facility."

Impressed by both the cost savings and environmentally-friendliness of georexchange, Dumont selected the system to heat and cool the winery's new 12,000-sq. ft. facility. Silver Rose's georexchange system uses a closed loop system submerged about 10 feet below the surface of the pond with 40 coils of 300 feet each and two pumps to monitor electro-consumption for the winery versus the rest of the facility.

"We were prepared to install a conventional heating and cooling system but the air temperatures around here can reach 110 degrees Fahrenheit in the summer and 30 degrees Fahrenheit at night in the winter. To use a conventional heating and cooling system would take a tremendous amount of energy," said Dumont.

Installed nearly a year ago, the georexchange system is exceeding expectations. "It's working well and doing the job for us just the way we expected. It keeps the winery at just the right temperature," said Dumont. What's more, the system offers approximately a 70 percent savings in operating costs per month. "From my research I learned that the potential savings from a georexchange system were tremendous, but with the rise in energy costs in California, I have saved even more than I expected," Dumont said. "I am even happier with my decision now." •



*The Silver Rose Winery uses the water from its nearby pond not only for its georexchange system but also as part of its wine fermentation process. The georexchange system has provided the winery a 70 percent savings in operating costs per month.*

## Care and Comfort for Small Business

“If we’re uncomfortable, it’s our own doing.” That’s how Gary Liddle of the Sierra College Small Business Development Center (SBDC) describes the geoechange system that heats and cools the SBDC building. Last year, the Sierra College SBDC moved into this building, which is nestled in the western slope of the Sierra Nevada mountains in Truckee, CA.

The building’s previous owners, the Truckee Donner Chamber of Commerce, renovated the building back in 1994. At that time, the Chamber wanted to show businesses how easily energy efficient technologies could be integrated into their existing work spaces. In particular, the Chamber wanted to demonstrate how certain measures could reduce summer cooling and winter heating requirements.

With this in mind, the Chamber selected geoechange to heat and cool the 1,400-sq. ft. building. Installed underneath a garage/storage space area, the four-ton geoechange system was designed to be flexible. For example, building owners can choose whether or not to heat the garage/storage space in the building. Further, by using geoechange, the SBDC has reduced electricity demand by 3.5 kilowatts.

In addition to geoechange, the building showcases a number of other energy and water efficient features including solar screens to reduce solar heat through window areas; passive solar flooring to store and distribute solar heat; faucet aerators that reduce water usage; and low-water use landscaping that requires less water to thrive than most landscapes.

The building’s location makes it ideal for SBDC, which services about 200 companies from Lake Tahoe to the Oregon and Nevada borders. With free one-on-one consultations and low-cost seminars, the SBDC provides business owners guidance to obtain Small Business Association loans, referrals to other sources of capital, and access to specialists in manufacturing, foreign trade, taxes and other small business concerns.

“Our whole purpose here is really to counsel people, helping them get started or continue in the right direction. Small business is the engine that drives economic growth here in Northeastern California, creating most new jobs and sales revenue,” said Liddle. “To help these companies we offer counseling at four locations in this region as well as onsite courses, Internet courses and a resource library here in this building.”

In fact, many of the client meetings are held within the SBDC building and several small businesses attend the onsite courses, which are offered year-round. As such, the offices, meeting rooms, resource center and computer lab are all kept comfortable economically thanks to geoechange. As Liddle pointed out, “The heating and cooling system not only provides us with the comfort we need but it is very energy efficient.” •

### Earth Comfort Update

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## State/Legislative News

### Californians Face Higher Energy Rates

Under a proposed rate agreement, the Public Utilities Commission will pass all the state's power-buying costs directly to consumers. In so doing, the PUC signs away its right to question and reject requests for higher power rates. The agreement comes as a result of a state law passed in January that says the commission must set rates to cover the Department of Water Resources' bills. As the state of California steps into the power-buying business, it has committed more than \$8 billion from the treasury for energy purchases, which caused Wall Street to downgrade the state's credit rating.

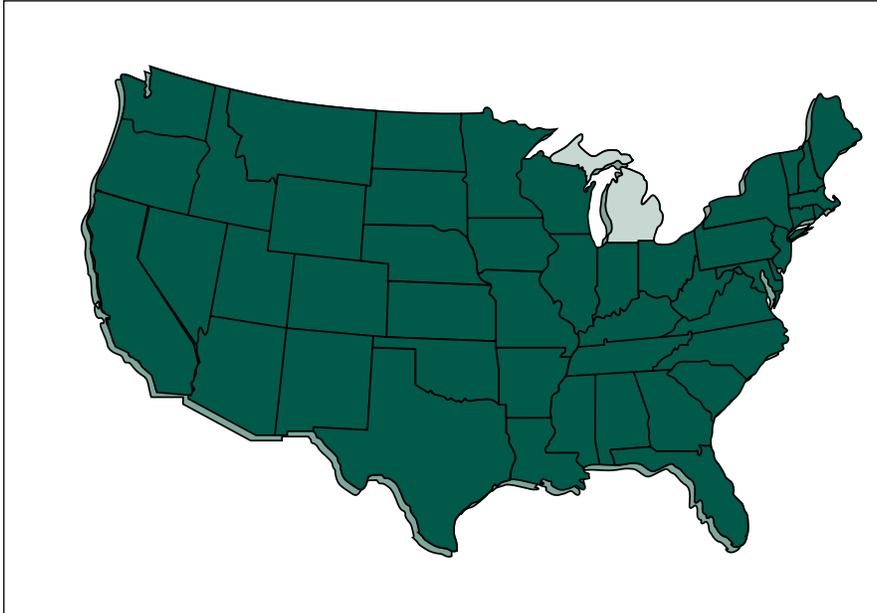
### Energy Crisis Worries Exporters

Exporters in the state of California — chemical companies to high-technology manufacturers — are trying to cope with the state's energy crisis while facing fierce international competition. According to the California Technology, Trade and Commerce Agency, last year exports accounted for \$126 billion. Trade experts say California exporters will feel the squeeze as they face surging power bills and energy demands. According to Susan Corrales-Diaz, chairwoman of the California Chamber of Commerce's International Trade Committee, higher energy bills have already begun to hurt companies' bottom lines.

### Blackouts Affecting Businesses

Business groups, such as the Silicon Valley

Manufacturing Group, have complained that California's rolling blackouts, which have struck California several times since January, have cost industry millions. The unpredictability of the blackouts led several business leaders to propose an advanced warning system. "Knowledge is power, and knowledge saves power," said Carl Guardino, Silicon Valley Manufacturing Group president and CEO, according to the *Mercury News*. Guardino recommended expanding the alerts to 24 and 48 hours. However, even supporters of the alert system acknowledged it will be very difficult to accurately predict when blackouts will occur.



### Summer Weather Leads to Emergencies

The California Independent System Operator (California ISO) issued a Stage One Emergency on July 3, 2001 and followed shortly thereafter with a Stage Two power emergency as operating reserves dipped below five percent. Northern California's appetite for power is 1,000 megawatts over forecast due to temperatures that are hotter and more humid than meteorologists predicted. Because the heat wave is regional in nature, levels of imported power have decreased as other states, especially those in the Southwest, also cope with high demand for power. In addition, 1,500 megawatts of imported power was also reduced when a two-unit power plant that serves Southern California tripped offline. The California ISO is urging consumers to take strong conservation efforts within their homes and offices to reduce the high electricity demand that is occurring this summer. •

## Connecting in California

*A Q&A with Lance Elberling, Pacific Gas & Electric (PG&E) and  
Dave Anderson, Association for Efficient Environmental Energy Systems (AEEES)*

*For more information on  
the programs PG&E  
offers, visit  
[www.pge.com](http://www.pge.com).*

*For more information  
about AEEES training  
sessions, visit  
[www.aeees.org](http://www.aeees.org).*

**Q:** How has PG&E responded to the energy crisis in California?

**Lance:** We're doing a number of things including offering rebates to customers. In regards to geexchange, we're actively promoting the technology because it offers tremendous energy efficiencies. We're currently offering a \$750 rebate to customers who choose geexchange for their heating and cooling needs. We also fund an awareness program through AEEES.

**Q:** What does this program include?

**Dave:** PG&E is funding a number of activities including nine homeshows, one tradeshow, 15 general presentations, five county regulatory workshops, six architect seminars, two geexchange courses, one commercial design course and one annual conference. AEEES is also providing outreach assistance on behalf of PG&E.

**Q:** Given the current energy crisis and the immediate benefits geexchange provides, has interest in the technology increased?

**Dave:** We've actually seen a large increase within the ranks of consumers and industry. We're receiving a number of calls from homeowners and commercial businesses interested in learning more about it. We're also starting to see large housing tracts becoming completely heated and cooled with geexchange. And, commercial businesses are particularly interested in the savings the systems provide.

**Q:** Are you surprised by the response?

**Lance:** It makes sense that interest in geexchange is growing. Last year, PG&E finished a fairly large public service campaign within its territories. As we were raising public awareness, almost simultaneously, the cost of electricity increased. The energy crisis has really captured people's attention and has them thinking about more efficient alternatives to conventional heating and cooling. People are starting to realize that energy efficiency is one way to deal with this energy crisis.

**Dave:** We've seen a renewed interest from HVAC contractors who want to learn about the technology. In January we conducted a training session on loop installation and had so many people interested that we had to turn some away. And in April, we offered the session again and didn't even need to advertise it, there were so many contractors interested. We've been hearing similar reports from manufacturers and others who are holding training sessions too. Word is getting out. More and more people are committed to the technology and the energy efficiency it provides. They realize that geexchange can have a positive impact on the energy problems in California and the rest of the country. •

## Following the Yellow Brick Road to Comfort

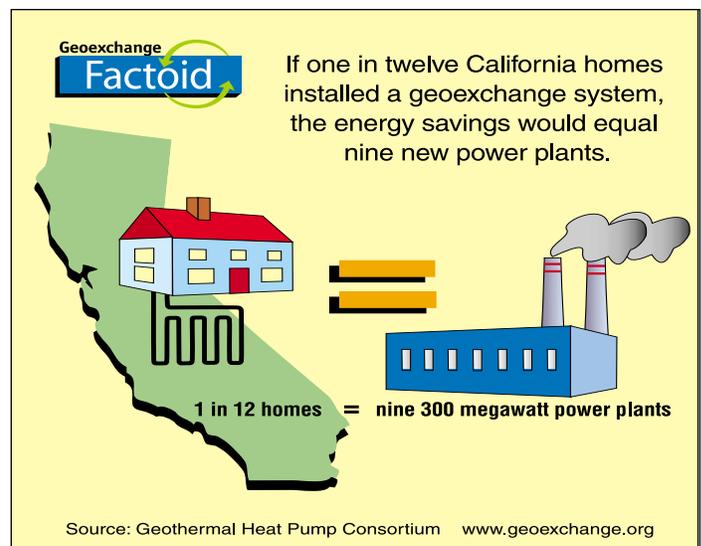
When Pat Barnard, A.I.A., owner of Patricia Barnard Architect, Inc., was asked to renovate Sacramento's River Oaks community center, the residence meeting rooms, staff offices and maintenance area were in sad shape. Some of the windows were boarded up, creating stifling temperatures within the community room; most of the facilities lacked either heating or cooling; and lead-based paint and asbestos contaminated much of the community center for the 382 unit, low income housing development.

Because of its dilapidated condition, the entire River Oaks development underwent a \$20-\$25 million renovation through the cooperation of the Sacramento Housing and Redevelopment Agency (SHRA), Federal Housing and Urban Development (HUD) Department, Sacramento Municipal Utility District (SMUD), Patricia Barnard Architect, Inc., and community residents. Those involved in the design and renovation process made it a priority to incorporate energy efficient features throughout the homes and community facilities. Now the community center is complete with its own "yellow brick road."

Nearly \$2 million was spent on installing the geoechange heating, ventilation and air conditioning units. SMUD provided over a half a million dollars in rebates for installation of energy efficient features including the geoechange system. "Most builders and architects reserve this high-end technology for luxury, custom built homes, but it's applicable anywhere. And here is where they need it most," said Barnard. "This is a system low income families can afford to turn on."

River Oaks' geoechange system features a closed loop buried vertically ranging in depth from 100 to 175 feet. Nancy Fong, assistant director of Housing for SHRA, is pleased with the energy savings that the system provides. "The energy savings are tremendous. The child care facility's monthly energy bills have dropped from approximately \$100-\$150 per month to only \$50 per month. And that's in a high use facility, where the doors are often open with children running in and out to the playground."

Featuring flooring accents and signage in the community's sports teams' colors, the community center is bright, cheery and functional. It even has a yellow brick road spiral ramp to grade, which allows accessibility to the community patio and creates a play area for children. "The yellow brick road was a whimsical touch," said Barnard. "It figuratively represents the energy efficient features and savings the residents will enjoy as well as the wizardry of tapping into the gold beneath our feet." •



*The 5,600-sq. ft. River Oak's Community Center, located in Sacramento, CA, uses a 19-ton geoechange system, which has reduced electricity demand by nearly 17 kilowatts. By choosing geoechange, River Oak's helps to reduce California's overall electricity demand.*

## Geoexchange: A Natural Choice for Students

The English children's author, Mary Martha Sherwood once said, "The book of Nature is full of lessons, ever new and ever varied; and to learn to discover these lessons should be the work of good education..." Few universities more closely follow the science behind Nature's lessons than the University of California, Davis. Founded in 1908, UC Davis has earned a reputation as an international leader in agricultural, biological, biotechnical and environmental sciences. It is only fitting, then, that a joint student housing venture between UC Davis and Tandem Properties, Inc. would include the environmentally friendly geoexchange.

To provide additional housing for students, Tandem Properties leased land from the university to create The Colleges at La Rue, which opened September 1, 2000. A 30-year-old property management company, Tandem Properties has created many communities in Davis, California. "The Colleges at La Rue is truly a partnership between Tandem Properties and UC Davis," said Laura Sutton, assistant residential manager.



*The Colleges at La Rue provides student housing for the University of California, Davis. The property recently selected a geoexchange system, which has reduced electricity demand by nearly 370 kilowatts.*

That partnership provides continuing undergraduate students, graduate and professional students with 197 housing units — everything from one-bedroom apartments to 4-bedroom townhomes — all within reasonable price ranges. "We recognize that this may be the first time a student is renting an apartment," said Sutton. "For that reason, we try to make it as affordable as possible."

In fact, affordability is one reason Tandem Properties and UC Davis chose geoexchange for the 26 buildings, a total of more than 218,000-sq. ft. Residents living in The Colleges at La Rue pay for their own utilities, which are billed through the university. "The system provides a great savings to students who may not have a whole lot of disposable cash," said Sutton.

"Each apartment has its own heat pump so each residence can control temperature levels, while taking advantage of being tied to the shared building ground loop," said Bill Dakin of Davis Energy, a consultant on the project. The energy efficiency provided by geoexchange appealed to Tandem Properties and to UC Davis. In addition, Pacific Gas & Electric (PG&E) provided some incentives to help bring down the cost of installing the system. The 420-ton system uses 207 heat pumps and 298 boreholes, drilled about 200 to 250-ft. deep.

The Colleges at La Rue first opened to students in September 2000 and has already been completely rented for Fall 2001. "We're happy with the comfort," said Sutton. "In the winter, the residents didn't have to use much energy to heat the units and the ambient temperatures in the units seem to be much more consistent. It's been great." •

## Here's to a Long and Happy Life

Loyalty. Many dog owners say that is one of the most amazing and cherished aspects of a dog's personality. His or her undaunting loyalty to the owner. Well, in Portola, CA, loyalty is a two-way street. Funded by private donations, memberships, sponsorships and memorial donations, the nonprofit High Sierra Animal Rescue Shelter is devoted to the lives of adoptable domestic animals. The Rescue Shelter strives to be a 'no-kill' animal shelter — meaning the shelter will care for every adoptable, domestic animal it finds indefinitely until a home can be found for the animal.

"We try to find homes for domestic animals, primarily dogs, in our area," said Doug Rodrigues, president and CEO of High Sierra Animal Rescue. "Normally, if our county shelter finds a stray dog or cat, the animal has about four days to be adopted before it is put to sleep. Before we came along, the county shelter was destroying about 500 dogs and cats a year." The Board of Directors for the High Sierra Animal Rescue is working hard to make sure those animals do not die. "Our goal is for Plumas County to be completely 'no-kill' by 2002 — and so far we're on track. We haven't lost a dog or cat since January," said Rodrigues.

To reach that goal, however, the Rescue Shelter needs more space for the up to 20 dogs it receives each month from the county shelter. Currently the Rescue Shelter has kennel space for eight dogs. When that space is occupied, the Rescue organization will board the dogs at local kennels at prices up to \$10 a day. "It's important the we expand our facility," said Rodrigues. "If we don't have the room, we won't be able to accept additional animals and more dogs will die."

With help in the form of a privately donated five-acre parcel of land, High Sierra Animal Rescue is building a shelter to accommodate about 30 domestic animals. "The new shelter will have 20 kennels plus quarantine and isolation areas. Once we're operational, we'll offer boarding and pet-related services to help generate money for the shelter," said Rodrigues.

With three times the capacity as the old building, the new shelter will be heated and cooled with geexchange. "The main reason we selected geexchange is the fact that the building will be running 24 hours a day, seven days a week," said Rodrigues. "The nice thing about the system is that once you get the building set to the temperature you want, it is very efficient. On a monthly basis, it is a lot cheaper to use geexchange than any of the alternative heating and cooling systems. Plus, we'll use radiant heating in the floors so they will always be warm and comfortable for the dogs."



*High Sierra Animal Shelter will use geexchange to heat and cool its new building. On a monthly basis, it will be cheaper for the Rescue Organization to use geexchange than to use any other type of heating and cooling system. Geexchange at High Sierra has reduced the demand for nearly 15 kilowatts of electricity.*

*Continued from page 11*

## **Long and Happy Life**

High Sierra Animal Rescue's facility rests on a good deal of land, making conditions ideal for a horizontal loop installation. Trenches for the 17-ton geothermal system were dug five feet deep and three feet wide. "The earth holds vast potential for heating and cooling," said Nell Thomas, director of Member Services for Plumas-Sierra Rural Electric Cooperative (PSREC). "Geothermal allows us to use the natural heating and cooling properties of the earth to effectively and efficiently maintain comfort in homes, offices, schools — and the High Sierra Animal Rescue Shelter."

With help from PSREC's loop lease program, the Rescue Shelter was able to amortize the cost of installation over thirty years. "That was a big advantage for us too," said Rodrigues. "As a private rescue group, we didn't have the funds to put money down for the installation."

In fact, Rodrigues is so impressed by the advantages of geothermal that he and his wife are considering retrofitting their own home. "The cost for propane gas keeps going up and up," he said. "It makes more sense now than ever to go with geothermal." •



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**California Edition**

