

Proposed expansion of state tax credit could boost use of geothermal heating and cooling systems

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Geothermal systems are increasing in New Mexico as a renewable energy alternative for heating and cooling buildings.

The Santa Fe Civic Housing project under construction on West Alameda Street just east of St. Francis Drive will use 119 geothermal pumps to heat, cool and provide hot water for the 110 homes and two community centers.

Española's City Hall and the Fort Sumner Municipal Schools both already have geothermal systems in some of their buildings. And the Jicarilla Apache tribe is looking to build an entire energy-efficient

agriculture building heated by geothermal, more technically known as a ground-source heat pump system.

A geothermal state tax credit approved in 2009 helped stimulate the number of systems residential customers ordered and ensured that installers are professionally certified. Recently, federal stimulus money helped municipalities and school districts purchase a few of the systems, which use the Earth's steady below-ground temperature to heat and cool buildings.

Now the state Legislature is considering House Bill 75, which expands the definition of who qualifies for the tax credit, a move that could double the number of claims and boost geothermal sales further.

Ground-source heat pump systems use water and antifreeze running through plastic tubes installed vertically or horizontally up to hundreds of feet below ground. In cold weather, the constant temperature of the ground heats the water in the pipe, which crosses a heat exchanger in the house and warms up the air. In hot weather, the process is reversed and the ground temperature cools the pipes and later the home's air. Excess heat from the geothermal system can also be used to heat a home's water. "Basically, the geothermal system takes the heat from the Earth, boosts it and distributes it through a building," said Joanne Peña, geothermal sales specialist for Dahl Plumbing in Santa Fe.

Geothermal systems are 50 percent to 70 percent more efficient than other types of electric- and natural-gas-fired furnaces and heating systems, according to the International Ground Source Heat Pump Association. They also cool 20 percent to 40 percent more efficiently than air conditioners, the association claims.

Those efficiencies are entirely dependent on where the system is used, the energy efficiency of the building and the skill of the installer. A geothermal ground-source heat pump system is expensive. Peña said the

system costs \$28,000 to \$32,000 for a typical 1,500-square-foot home.

Homes, apartment buildings and commercial offices, especially those using forced-air heaters, can be retrofitted with geothermal systems.

Fort Sumner Municipal Schools Superintendent Patricia Miller found geothermal was a good option for only two of three buildings analyzed in the district. "We did a life-cycle cost analysis on our own elementary school building to determine if it would be more cost effective to replace the current package (heating and cooling) gas-fired units with a ground-source heat pump system, and discovered that it would not be the best option. I encourage everyone to do a thorough analysis to determine what is best for an existing building."

Still, the geothermal system retrofitted into a 30,000-square-foot gym in August and another in a new building, have proven money savers. Nine other schools in the district are conducting energy audits.

In Fort Sumner, "ground water was only 13 feet below the surface, and there was substantial gravel that would dissipate the heat," Miller said. "These two factors, along with the temperature of the water, made our terrain virtually ideal for a geothermal installation. Not every school or community is in that circumstance."

The city of Santa Fe received a \$5.3 million green grant through federal stimulus funds for the entire Villa Alegre project. The city had to commit to making the housing project an energy-efficient, "green" development. Along with the geothermal heat pump systems, the project will generate at least half of its own electricity using solar photovoltaics. Ed Romero, Santa Fe Civic Housing Authority director, said the combination of solar and geothermal seemed the best combination with the shortest payback period.

Romero said the first 50 homes and one community center should be finished by April and the second phase of 60 homes completed in May. People who live in the houses will enjoy low utility bills since a minimal amount of electricity and no natural gas is needed to power the geothermal heat pumps.

The state Legislature has helped geothermal by providing tax incentives. In 2009, New Mexico began offering up to a \$9,000 tax credit for people who install ground-source heat pumps.

Now HB 75 expands the definition of who qualifies for the tax credit to include tribes and nonprofit 501(c)(3) organizations. The bill means the state would forgo about \$290,000 a year in revenue and potentially double the number of claims for the credit.

If approved, the credit would be effective for 2011 through 2021. HB 75 also would track how many geothermal jobs are created because of the tax credit.

The bill's approval would be good for the Villa Alegre civic housing project because it will allow the city to recoup some of the cost of the project.

Peña said the tax credit has boosted sales and installations. Before 2009, Dahl was installing about five a year. After 2009, "our geothermal business increased substantially," said Peña, who also is a certified geothermal installer.

State law requires geothermal installers to be certified. Before 2009, there were three installers, Peña said. Now, there are 74 certified installers around the state. Certification is handled by the 33-year-old International Ground Source Heat Pump Association.

The state also passed a law allowing counties to establish renewable energy special tax assessment districts to help homeowners who want to install geothermal, solar or wind power systems. Santa Fe County became the

first to approve such a district, which allows a homeowner to take out a low interest, long-term loan, purchase a system and pay the loan back through property taxes. Known as a PACE program, the effort has been stalled by resistance from federal agencies that oversee federal mortgage programs.

Dahl Plumbing also offers geothermal classes twice a month for potential customers who want to know more about the systems.

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