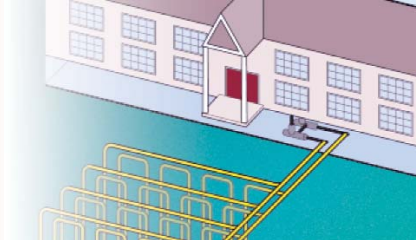


# Geoexchange in Schools



## Geothermal Heat Pump

Indian River, Lewis County

### Background

As part of a new 71,500 square foot elementary school building, Indian River Central School District undertook a preliminary study which indicated the overall cost of heating, ventilating, and maintaining the building could be lowered by using a geothermal heat pump system. Subsequently, the Indian River School Board requested the assistance of the New York State Energy Research and Development Authority (NYSERDA) to undertake a detailed analysis to determine the feasibility of a geothermal heat pump system to heat and cool the building.

Geothermal heat pumps, or geoexchange systems, tap the renewable energy available from the earth to provide efficient heating and cooling. In the winter, this is accomplished by a series of pipes buried beneath the earth that extract heat from the ground and carry it to a geoexchange unit. The process is reversed in the summer. Heat is drawn from the interior air and transferred to the ground. The systems are environmentally friendly, burning no fossil fuel and producing no greenhouse gases.

### Recommendations

The goal of this Technical Assistance project was to compare the use of geothermal heat pumps to air-source heat pumps. Since the proposed building site is not serviced by natural gas, traditional fuel choices are limited to electricity and fuel oil. Both types of heat pumps would yield benefits. There would be no on-site combustion, combustion by-products, or fuel storage. The geothermal system, however, has the ability to transfer all of the schools heating and cooling loads from the earth to the building.

### Results

While the air-source system has a lower initial cost, the potential energy and maintenance savings of the geothermal system pays for itself.

- Annual Energy Savings: \$11, 300
- Incremental cost of the Geothermal Heat Pump System over the alternative Air Source Heat Pump: \$178,750
- Total Operation and Maintenance savings over 20 year life cycle: \$285,600
- Simple Payback: 12.5 years

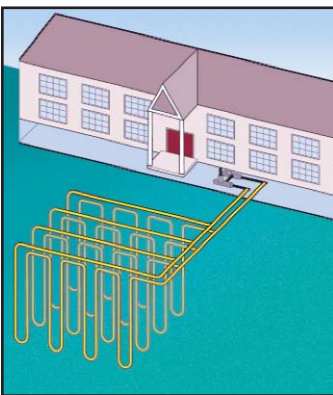
### New York Energy \$mart<sup>SM</sup>

All New York Energy \$mart<sup>SM</sup> programs are funded by a System Benefits Charge (SBC) paid by electric distribution customers of Central Hudson, Con Edison, NYSEG, Niagara Mohawk, Orange and Rockland, and Rochester Gas and Electric. NYSERDA, a public benefit corporation established by law in 1975, administers SBC funds and programs under an agreement with the Public Service Commission.

New York Energy \$mart<sup>SM</sup> programs are designed to lower electricity costs by encouraging energy efficiency as the State's electric utilities move to competition. The programs are available to electric distribution customers (residential, commercial, institutional, and industrial) who pay into the SBC.

*"This promising technology can play an important role in our efforts to ensure we have the power we need to continue to create jobs and offer consumers new ways to save money. Whether it's solar power or geothermal technology, we must continue to expand the menu of energy options for all New Yorkers."*

- George E. Pataki  
Governor  
New York State



Closed, vertical-loop system