

# Lady Bird Johnson NetZero Middle School, Irving Texas

## Case Study



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### Bosch FHP Geothermal Heat Pumps

First NetZero Public School in Texas

#### Project Goals:

- ▶ Sustainable heating & cooling
- ▶ Energy savings and environmental comfort
- ▶ Educational outreach for Texas students

#### Background

Lady Bird Johnson Middle School in Irving, Texas utilizes a variety of sustainable technologies, including FHP geothermal heat pump systems, to significantly reduce energy consumption. As part of the Irving Independent School District (IISD), the design was meant to motivate students and teachers to focus on innovation and creativity while reducing energy use by two-thirds as compared with IISD average school energy consumption. LBJ Middle School is the first Net Zero public school in Texas, the first such middle school and the largest Net Zero school in the U.S.

#### Installation Summary

107 Bosch FHP model EV and EC geothermal water source heat pumps from one to 20 tons were installed on the campus, fed from 505 geothermal wells bored approximately 250 ft deep. Mike Beebe, Senior VP of Century Mechanical Contractors, reported that the installation of geothermal heat pumps progressed well, and there have been few callbacks.

Among the sustainable technologies incorporated are:

- ▶ Bosch FHP model EV and EC geothermal water source heat pumps from one to 20 tons
- ▶ 2,988 solar photovoltaic panels – 600kW solar array with 850,000kWh annual output
- ▶ Wind turbine generating 2.4kW electrical capacity
- ▶ ENERGY STAR rated kitchen, high-efficiency glazing and wall/roof insulation
- ▶ LED lighting, light shelves and light harvesting for substantial daylight in classrooms
- ▶ Water cistern for recycling and irrigation



Bosch FHP model EC water to air heat pump

## Benefits and Conclusion

According to consulting engineer Don Penn, P.E. of Grapevine, Texas, "LBJ MS is the first school utilizing geothermal systems in the district, and the owner has been impressed with the geothermal system installed at this campus." Assistant Superintendent for Support Services of the Irving Independent School District Scott Layne reported that the environmental comfort system is well-balanced and provides constant temperature throughout the campus buildings.

Jim Scrivner, Accredited Texas Energy Manager for IISD, commented that in its first full year of operation, the school is achieving over 99% Net Zero. "When energy use is compared with other schools in the same district, LBJ MS consumes about 60% of average energy consumption."

The school is designated LEED Gold. The LBJ Middle School and architectural firm Corgan Associates were awarded the 2012 Caudill Award, a collaborative project of the Texas Association of School Administrators, Texas Association of School Boards, and the Texas Society of Architects.

With an interactive monitoring center and numerous class activities, students experience a three-dimensional learning environment to foster recycling, energy efficiency and sustainability in their school and throughout the general society.

**"The owner has been impressed with the geothermal system installed at this campus."**



### Project Name:

- ▶ Lady Bird Johnson Middle School, Irving Independent School District, Irving, TX

### Engineer:

- ▶ Don Penn, P.E.

### Equipment Installed:

- ▶ 107 FHP model EV and EC water source geothermal heat pumps

### Manufacturer's Representative:

- ▶ Texas Air Systems

### Architect:

- ▶ Corgan Associates, Inc., Dallas

### Installer:

- ▶ Century Mechanical Contractors, Ft. Worth

### Completion Date:

- ▶ August 2011