PROJECT PROFILE

Metropolitan Nashville Airport Authority – Geothermal

Nashville, TN

Awards

- 2017 Envision Silver Award for Sustainable Infrastructure - Water Source Geothermal Project
- 2016 Environmental Achievement Award in the Special/Innovative Projects category from the Airports Council International-North America (ACI-NA).

Savings Information

- 1.3 Million annual kilowatt-hours saved
- 6,000 annual kilowatts of peak demand electricity saved
- More than $430,000 in annual utility savings
- Annual reduction of 30 million gallons of potable water

> "This historic project will significantly reduce our electricity usage and potable water consumption, which will result in substantial annual utility savings. This is the very essence of sustainability."
>
> **Rob Wigington**
> ***MNAA President, CEO***

The Metropolitan Nashville Airport Authority (MNAA) partnered with Energy Systems Group (ESG) to develop an innovative use for the former Hoover rock quarry located on the airport's property. This geothermal lake plate cooling system project, dubbed the largest in North America, reduced the airport's chilled water energy consumption from February to May 2016 by more than 50 percent.

The project was designed to reduce the airport's electricity usage by 6,000 kilowatts of peak demand and result in annual savings of 1.3 million kilowatt hours. The MNAA is projected to save more than $430,000 per year in utility savings. In addition, the project allows for the use of quarry water for landscape irrigation resulting in savings of more than 30 million gallons of potable water per year.

The MNAA received multiple awards for the project including the 2017 Envision Silver Award for Sustainable Infrastructure - Water Source Geothermal Project and the 2016 Environmental Achievement Award in the Special/Innovative Projects category from the Airports Council International-North America. The MNAA was also awarded the 2015 Governor's Environmental Stewardship Award in the Sustainable Performance category by the Tennessee Department of Environment and Conservation, recognizing its programs and initiatives that improve and protect the environment and natural resources.

This geothermal project represents ESG's third phase of work with the Metropolitan Nashville Airport Authority. ESG previously completed a $4.6 million two-phase energy savings performance contract that primarily included lighting upgrades throughout the Nashville International Airport and other MNAA-owned buildings.

Strategies & Solutions

The 43-acre former Hoover rock quarry has an average depth of 150 feet, contains approximately 1.5 billion gallons of water and at a depth of 50 feet, maintains a constant temperature of 50 degrees Fahrenheit year round. The project was designed to replace the airport's cooling towers by taking advantage of the water's constant cool temperature to cool the water from the airport's central plant. Water is cooled by circulating in a closed loop system through the submerged lake plate heat exchangers and then back to the airport's central plant.

The project was developed, engineered, and constructed through a collaboration of Energy Systems Group, Garver, Smith Seckman Ried, and Blakley Construction Services.

ESG ENERGY SYSTEMS GROUP

Energy Systems Group (ESG) is a leading energy services provider that specializes in energy efficiency, sustainability, and infrastructure improvement solutions in the government, education, healthcare, commercial, and industrial sectors. ESG offers a full range of sustainable infrastructure solutions including waste-to-energy, distributed generation, and renewable energy.

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