When Alabama Power Company expanded its central office in Birmingham, Alabama in 1986, they wanted to use the newest and most efficient refrigeration/storage system capable of heating and cooling the 900,000-square-foot office building while conserving as much energy as possible. The ice storage system was adapted and is used to encourage other offices within the state to save energy.

The ice storage system produces and stores large amounts of ice during “off” hours using microprocessor-controlled compressors. The microprocessor uses weather forecasts and occupation schedules to control the temperature within the building.

The thermal storage system utilizes “off-peak” power to generate some 1.25 million pounds of ice each night that will be used to meet the cooling requirements of the facility which will be used the next day during the peak generating conditions of the electric utility. The 14,750-ton-per-hour storage system allows the reduction in peak demand of the facility by approximately 1,500 kilowatts of electrical demand, or $85,000 a year in energy costs, when compared to an equivalent facility without the storage capability.

Space heating for the building is accomplished by reclaiming waste heat from the compressors. The educational and functional considerations of the system have been demonstrated to almost 1,500 architects, engineers, manufacturers, developers, consultants, and others who have toured the project.

The project was designed to be state-of-the-art as related to energy usage and energy management. At the time of completion, the thermal storage unit was the largest thermal storage system in the world which utilized ice as the cooling storage medium.

This installation is on the cutting edge of technology in design of the HVAC and building control systems. The design won the Grand Award of the Specifying Engineer publication during the design phase; received the Energy Innovation Award by the Department of Energy; Energy Innovation Award by the state of Alabama; and first place in region seven, American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), new commercial construction category.

Under the direction of Kenneth M. Penuel, this project is the result of cooperation between Alabama Power Company and Alabama-based firms: Energy Management Consultants, Inc.; Miller and Weaver, Inc.; Bevis Engineering; and Gresham Smith & Partners.

Through the design of its corporate headquarters building, Alabama Power has made a firm commitment to using energy wisely and efficiently.