



## Inventors

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# Secured and Separately Specified Building Thermal Energy Storage Using a Programmable Thermostat

AzTE Case # M15-008P

## Background

Thermal energy storage (TES) with HVAC systems in buildings is a highly cost effective solution to rising energy demands, but the distributed nature of these HVAC-TES systems creates contractual and technical issues for utility providers. Standard technologies require expensive telemetric or remote monitoring and control systems. Low-cost systems are a key to providing a solution for electrical load management to HVAC-TES systems. Utility providers need to be better equipped to manage power delivery to and from disparate HVAC-TES locations.

## Invention Description

Researchers at Arizona State University have discovered a method of electrical load management for HVAC-TES systems. A programmable thermostat controls the use of the thermal storage capacity to the exact specifications of a party such as the electrical power/utility provider. These specifications can only be altered by that party, and are based on variables such as onsite electrical generation, energy use, and the timing and pricing of available energy from the power grid. Normal HVAC functions such as temperature control and timing are left to the residents/owners/operators of the building. Electrical power/utility providers will be better equipped to enter into contractual relationships for load management with building residents/owners/operators. The need for costly telemetric or remote monitoring and control of the storage capacity is eliminated in a fashion that is transparent to the building's owners/operators/residents.

## Intellectual Property

### **Status:**

*Pending*

## Potential Applications

- Building energy management
- Smart power grids
- Microgrids
- Electrical power load management

## Contact

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## Benefits and Advantages

- **Transparency** – Transparent monitoring and control of thermal storage capacity by electrical power/utility provider without expensive telemetric technology.
- **Energy Efficiency** – Plan unit operations based on the electrical demand management capabilities of specific HVAC units to decrease wasted thermal energy storage capacity.
- **Low cost** – Eliminates the need for costly telemetric or remote monitoring.