

## Hospital IES Provides Clean, Secure Energy Site Makes Gains Toward LEED™ Certification

### Background

During FY 2006, ORNL partnered with Burns & McDonnell and Austin Energy to install a state-of-the-art integrated energy system into the Dell Children's Medical Center of Central Texas. The site is undergoing a \$175 million redevelopment that includes the incorporation of an integrated energy system (IES) that will provide high levels of energy efficiency, energy security, and environmental protection.

The IES will be part of the first phase of a 35,000 square-foot central utility plant to be built on-site. Environmental concerns of those living in the surrounding Austin, Texas community have been allayed as the reduced NOx emissions of the IES have been publicized. Furthermore, the on-site plant (and use of DE IES) will allow the hospital to operate independently of the electric grid in the worst of circumstances. Sustained power losses on the Gulf Coast following Hurricane Katrina in 2005 resulted in heightened awareness of the critical need for reliable power in medical facilities during disasters. Dell will be one of the first grid-independent hospitals in the state of Texas, and the site is one of the first CHP plants in the nation to be eligible for Energy and Atmosphere Credit 1 (EA-1) points toward LEED™ certification.

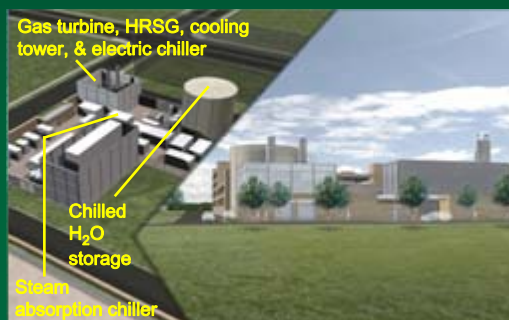
### Technology

The 4.3 MW IES is owned and operated by Austin Energy and has achieved 80% fuel efficiency (LHV); standard generation plants achieve around 30% efficiency. The packaged system developed by Burns & McDonnell combines a low-emission Solar Mercury-50 combustion turbine, a 1,000-ton Trane Horizon steam absorption chiller, and a 8,000 ton-hr Thermal Energy Storage tank. The use of pre-engineered, modular components created capital cost savings for Austin Energy.

A high-efficiency, natural gas turbine generator produces 100% of the hospital's electrical and thermal energy with excellent part-load efficiency and



*Packaged CHP system construction for the Dell Children's Medical District Energy System*



low emissions. As the turbine produces electricity, its waste heat is used to generate steam and chilled water for space conditioning with no additional emissions. The absorption chiller uses steam from a Heat Recovery Steam Generator (or stand-by boiler) to produce chilled water for air conditioning without using CFCs. Steam is also available for space heating and the hospital's sterilization equipment. An electric centrifugal chiller and packaged boiler are provided for peak demand periods and turbine maintenance downtime. Future phases will include an additional turbine and absorption chiller.

### **Benefits of IES installation:**

*Energy efficiency*  
*Energy security*  
*Reduced emissions*  
*Reduced capital costs*  
*Lower fuel costs*



*Pre-engineered, modular components create capital cost savings for Austin Energy*

### **Future Work**

ORNL will monitor and evaluate system performance at Dell in order to provide feedback regarding improvements to future installations.

### ***Points of Contact:***

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