The University of Texas at Austin will add more than 2 million square feet by 2013. More square feet means more utility infrastructure needed to serve the new space. In order to meet these needs, Utilities and Energy Management (U&EM) has undertaken two large projects: 1) Construction of Chilling Station 6 (scheduled to complete February 2009) and 2) Construction of a Thermal Energy Storage (TES) Facility (scheduled to complete September 2010).

**Construction of Chilling Station 6**

UT Austin benefits from a large underground infrastructure of tunnels (circa 1930) that distributes electricity, along with steam for heating buildings and chilled water for cooling them. Four chilling stations connect to the underground chilled water piping network.

In order to meet the university’s forecasted demand for cooling, the U&EM department is constructing a new 15,000 ton state-of-the-art chilling station adjacent to the Power Plant Expansion (PPE). See rendering below.

This new chilling station is replacing Chilling Station 2 (CS2) and will help meet the cooling needs of the new Dell Computer Science facility currently in planning. In keeping with U&EM’s tradition of continued savings and efficiency this new chilling station will be about 30% more efficient than Chilling Station 2.

**Construction of a Thermal Energy Storage Facility**

An equally important issue to the university’s chilled water capacity is the underground pipes that deliver cold water to the buildings. Since the 1930s, the campus has been gradually adding underground tunnels and pipes for utilities. But back then no one anticipated the campus would grow like it has, and now the size of pipes needed to handle the increased volumes of chilled water are inadequate.

**Location of TES near Simkins Hall Dormitory**

The Thermal Energy Storage Facility that will be constructed just east of the Simkins Hall Dormitory is a facility that will allow the university to add cooling capacity at about a third of the cost of another chilling station. This facility will consist of an insulated four million gallon water tank that will store chilled water produced at night when the demand for cooling is less.

The Thermal Energy Storage Facility will look something like this:

New 42 inch diameter pipes will be installed between this tank and the central part of the campus using trench-less technology called *micro tunneling*. Two 52 inch diameter tunnels measuring 1,500 feet in length will be bored 40 feet below ground. Then 42 inch steel pipes will be slipped inside the tunnels and placed between Simkins Hall Dormitory and the corner of 24th and Speedway. The boring route will actually go under Waller Creek and will carefully avoid existing building foundations. A graphical representation of this approach looks something like this:
Apart from the two-thirds first cost savings, the TES facility:

1. Will allow the university to avoid the construction of another chilling station. This means the campus will not need to use additional refrigerants that affect the earth’s ozone.

2. Will be more efficient than a new chilling station because pumps will move the cold water produced by the existing chilling stations rather than having to power large chillers. This means less greenhouse gas will be produced.

3. Will have lower maintenance costs. The facility’s maintenance cost will be a fraction of a chilling station. This creates savings that are passed onto the campus at large.

4. Will create a new supply and energy pathway to meet the needs of the campus that is cost effective, innovative, reduces greenhouse gases and continues the efficient tradition of the U&EM department.

The History of UT Austin’s utility infrastructure

Since 1928, all of the energy needed for the university’s Main campus has been produced on campus by a combined heat and power system located in the Carl J. Eckhardt Heating and Power Plant. The system operates about 20% more efficiently than typical commercial systems. Over the past ten years, the plant efficiency has improved 15% thanks to improvement projects in the plants and to the use of new technology.

These improvements have allowed the university to avoid over $200 million in additional energy costs and 2.5 million tons of CO₂ when compared to electricity purchased from the Texas grid. Thanks to this effort the University was awarded the 2008 Texas Environmental Excellence award in the “Large Business/Technical” category. If you want to learn more about the TEEA award visit http://www.utexas.edu/utilities/