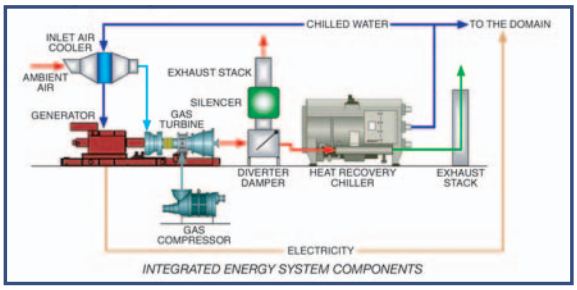
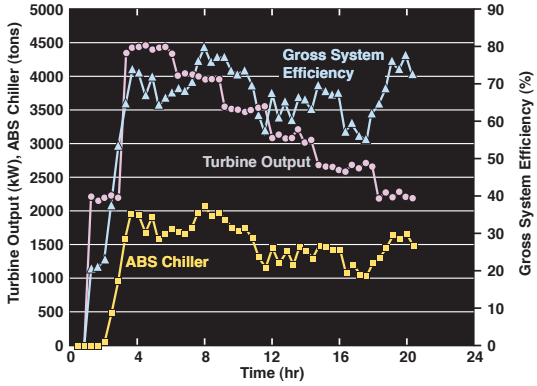
Industrial Gas Turbines
Emissions Reduction

Improved Efficiency for Distributed Energy Recycling waste heat to produce the steam that drives a generator or that runs a chiller is not new. What is new at the Domain in Austin, Texas, is that a very big chiller is being powered by waste heat alone with no additional emissions. By design, the full thermal output of the natural-gas-powered Solar combustion turbine closely matches the capacity of the Broad USA chiller.

Since the fall of 2004, testing of the integrated energy system (IES) has verified fuel efficiency of more than 80%, based on the "higher heating value" (HHV) of natural gas. In comparison, the nationwide average efficiency for electricity production by a central power plant is 32%.



The IES includes a natural gas turbine and a heat-recovery chiller.



Gross efficiency for the IES reaches 80%, even when the turbine-generator is operated at part load.

The prime mover for the Austin Energy IES is an electric generator that produces 4,600 kW of electricity at 12,470 V. The generator is driven by a Solar Turbines natural-gas-powered turbine.

The IES includes a Broad absorption chiller rated at 2,535 refrigeration tons. The chiller produces 6,073 gpm of water chilled to 44°F.

Since June 14, 2005, the Austin Power IES has been providing power and cooling for the Domain, 1 million square feet of retail, industrial, and residential space.

A Team Effort

- Oak Ridge National Laboratory teamed with Austin Energy to engage the Burns and McDonnell engineering firm to install and test a modular IES at the Domain, a multi-use industrial park in Austin, Texas.
- Burns and McDonnell teamed with Broad USA and Solar Turbines to develop a modular IES with a 5-MW combustion turbine generator and an advanced waste-heat-fired 2,500-ton absorption chiller.

An Award Winner The Texas Council of Engineering Companies awarded Burns and McDonnell a silver medal in the "Special Projects" category for the Austin Energy IES at the 2005 Engineering Excellence Awards ceremony.

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Office of Distributed Energy