



CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

University of Arkansas

5.2 MWe CHP System

Packaged CHP System Helping Save Central Plant Expansion Costs
in Higher Education



University of Arkansas campus – courtesy of www.uark.edu

Site Description

The University of Arkansas's Fayetteville campus is the flagship of the University of Arkansas (UA) System. Founded in 1871 as a land-grant institute, the campus now consists of over 370 buildings including the Central Utility Plant/Central Chilled Water Plant, Nanoscale Material Science and Engineering Building, and the Donald W. Reynolds Razorback Stadium. The campus spans approximately 512 acres in order to serve almost 30,000 students from all over the world. UA's Office for Sustainability uses the campus as a 'living laboratory for innovation' by overseeing the University's sustainability goals. Implementation of CHP into operations supports goals toward a more resilient Fayetteville.

The University's 5.2 MW combined heat and power system, located in the University's heating plant, came online in 2016, simultaneously providing hot water and power for the campus.

CHP System Value Proposition and Benefits

The University made the decision to install the 5.2 MWe gas turbine generating CHP unit in 2013 and began operating in 2016. This decision was a vital piece of UA's Climate Action Plan, based upon reducing source air emissions. The central station electric power this CHP unit replaced was 75% coal-fired.

Quick Facts

LOCATION: Fayetteville, Arkansas
MARKET SECTOR: Higher Education
POWER GEN. CAPACITY: 5.2 MWe
EQUIPMENT: Solar Turbine – Taurus 60-7301
FUEL: Natural Gas
IN OPERATION SINCE: 2016
TOTAL PROJECT COST: ~\$16.1 million
YEARLY ENERGY SAVINGS: \$3,000,000 in electrical savings, plus additional savings with steam production
ENVIRONMENTAL BENEFITS: Diverts approximately 35,000 metric tons of CO₂ equivalent from the atmosphere.

“The CHP system can satisfy the full campus requirement for steam for five months of the year. Under winter-load conditions, the system can furnish approximately 35% of the campus steam requirement.”

***- Scott Turley
Executive Director of Campus Utility Services at
University of Arkansas***

Contributing towards the University of Arkansas Climate Action Plan (version 2.0, approved in 2014), this CHP system reduced emissions by approximately 22,000 metric tons of CO₂ equivalents in its first year of operation. Further, this cost-effective CHP project has allowed the university to approach their 2021 mid-term emission goal five years ahead of schedule.

In addition to contributing to annual sustainability goals, CHP systems can help universities keep their students safe by providing crucial back-up power in the

event of power outages across campuses. As this project demonstrates, a CHP system provides research institutes and universities additional protection for their vital work in the event of a power outage.

CHP Equipment & Operation

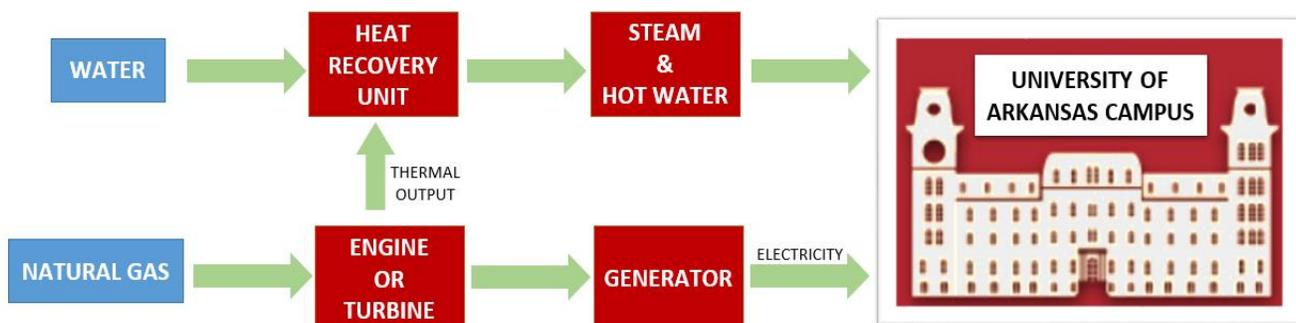
The CHP system consists of a 5.2 MW gas turbine generator, a 28,000 lb./hour heat recovery boiler, as well as an additional 40,000 lb./hour of modular high efficiency boiler capacity. The gas turbine and heat recovery steam generation (HRSG) are located in the existing heating plant building, which was built in 1956. This building also contains 10 Miura high pressure steam boilers.

The turbine used is a Taurus 60-7301, manufactured by Solar Turbines. These turbines have relatively long major maintenance intervals, including engine overhauls approximately every 30,000 hours. This brings the unit back to purportedly new condition.



HRSG Image courtesy of [Con-Real, LP](#)

Key Benefits



This CHP project helps advance the University’s and the State of Arkansas’ sustainability goals.

- Upgrades the heating plant production infrastructure that provides hot water and steam to the campus.
- Provides emergency power to critical research buildings in the event of campus-wide power outages.
- Increased efficiency to 73% (up from 40% in prior system).
- Removes ~ 35,000 metric tons of CO₂/year, the equivalent of ~7,400 passenger cars’ GHG emissions in one year.

For More Information

**U.S. DOE SOUTHCENTRAL CHP
TECHNICAL ASSISTANCE
PARTNERSHIP (CHP TAP)**
Gavin Dillingham, PhD, Director
281.216.7147
gdillingham@harcresearch.org

UNIVERSITY OF ARKANSAS
Scott Turley, Executive Director of
Campus Utility Services
lturley@uark.edu

More CHP Project Profiles:
[Southcentral CHP TAP](#)

Date produced: October 2019