



Campus Energy System's Role in Greenhouse Gas Reduction Strategies for the University of Texas

Presented by:

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Agenda

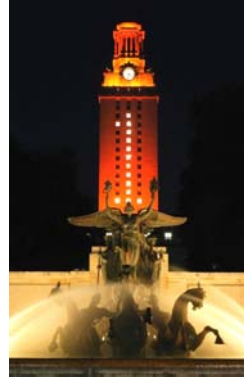
- Introduction
- Background on the CHP System
- Scale of CHP Produced Energy Compared to Total Campus Green House Gas Emissions
- The Performance of the System Compared to the Grid
 - Greenhouse Gas Emissions & Efficiency
- The Campus Benefits Realized by our System
- Q&A



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Background

- **Total Budget of \$2.076 billion**
- **Contracts and Grants of \$511 million**
 - **Federal Contracts and Grants of \$281 million**
- **19.1 million square feet**
- **Student enrollment of 50,000**
- **Staff of 20,000**



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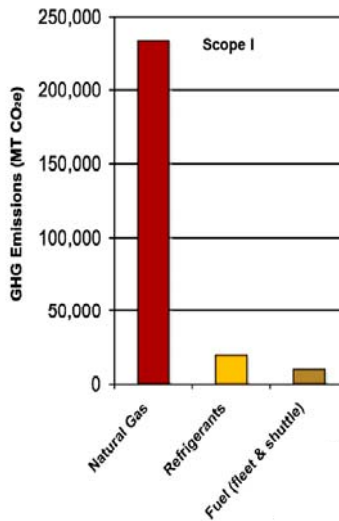
Background

- **100% power, heating and cooling requirements for 16 million sf and 150+ buildings**
- **Power Plant (by 2010)**
 - **137MW of on-site Combined Heat and Power (60 MW Peak)**
 - **1.2 million lb/hr of steam generation (300K Peak)**
- **Chilled Water (BY 2010)**
 - **48,000 tons capacity in 4 plants (32K Peak)**
 - **4 Million Gallon/39,000 ton-hr TES Tank**
- **6 miles of distribution tunnels**
- **99.9998% reliability over last 35 Years**



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Relevance of the CHP System to GHG Emissions

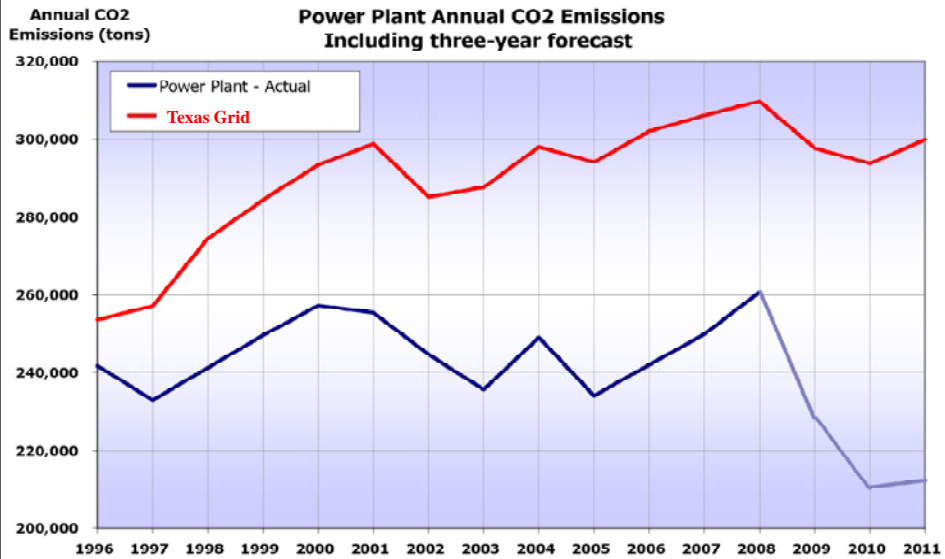


- **Direct** – 263,264 MT CO₂e
- **Indirect (Purchased Energy)** – 29,328 MT CO₂e
- **All Other Indirect** – 183,077 MT CO₂e

**CHP System is 49%
Of Total Emissions**

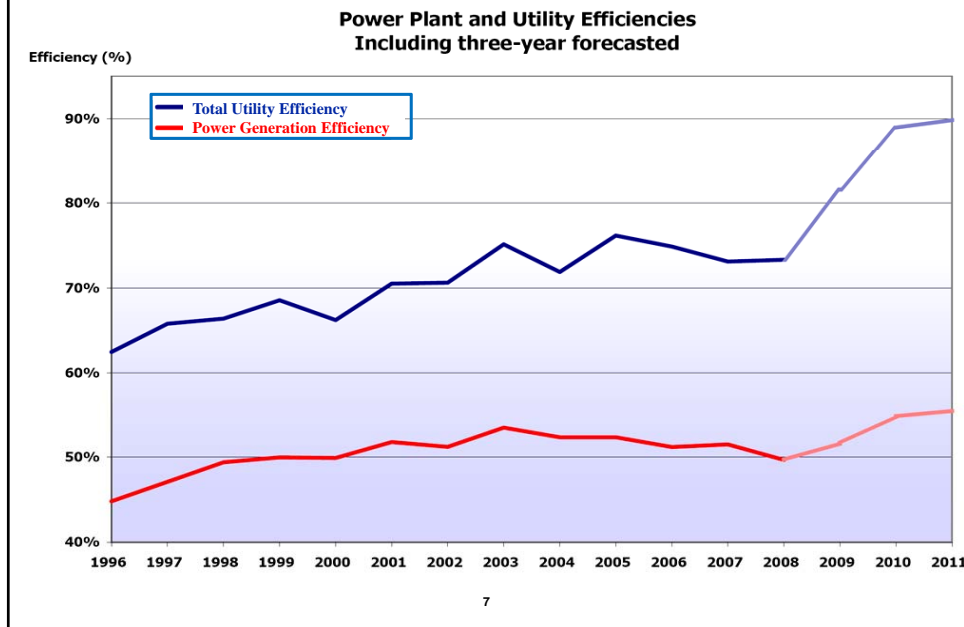
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Less Emissions vs. Purchased Power



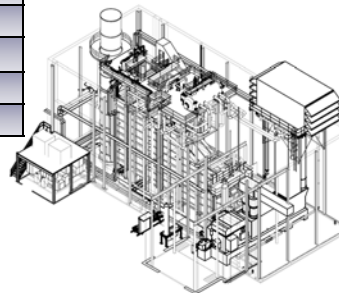
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Reason for Reduced Emissions - Efficiency



Major Plant Improvements

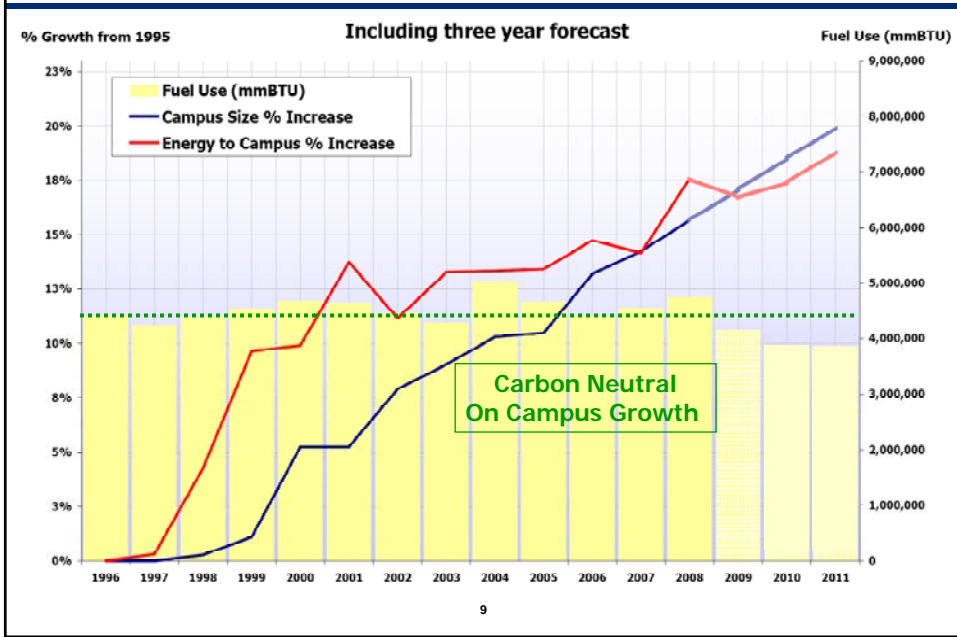
Project Description	Resulting Gas Savings (MMBTU/Year)	Resulting Emissions Reduction (Tons/CO ₂ /Year)
Steam Turbine #9	200,000	11,000
Cooling Tower #1	50,000	2,750
Boiler FGR/NO _x Retrofit	200,000	11,000
Steam/Feed Water By-Pass	500,000	27,500
Chilling Station 6	130,000	7,150
Inlet Air Chilling	120,000	6,600
Thermal Energy Storage	40,000	2,200
Chilling Station Modernization	20,000	1,100
Gas Turbine # 10	399,400	21,967
TOTAL	1,659,400	91,267



**Plus Use of Proven Technology such as
Digital Controls, Plant Optimization Software
& Plant Modeling**

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Campus Growth vs. Gas Consumption



Summary

Campus has not been a load to the Texas electrical grid since 1929

Campus research needs have been served with a reliability of 99.998% for 35 years

THE UNIVERSITY OF TEXAS AT AUSTIN

The CHP and District Energy System is Projected to be 90% efficient in 2011

\$170 million modernization of the entire utility system was paid using efficiency savings



Questions?

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