



UNIVERSITY OF TEXAS, AUSTIN

PLATINUM CERTIFIED UNDER PEER V2

CASE STUDY
JULY 2020

In 2020, The University of Texas at Austin became the first PEER Platinum certified educational campus under the PEER v2 Rating System.

“ The PEER certification process, administered by the global and independent GBCI organization, is a rigorous program that allows Utilities and Energy Management to be true to our goal of being among the best university utilities providers in the United States.

To accomplish this, we have developed and adopted the “13 Principles” (Incremental Improvement through Innovation). Adhering to the principle requires the use of accurate granular data, with careful consideration before implementing new concepts, software, or tools incrementally. Improvements are then analyzed, and the entire process is repeated using innovative ideas and practices.

Being open to innovation requires a certain comfort level with risk. It also requires a holistic approach. We must have highly supportive senior leadership, dedicated management, effective administrative processes and a well-trained workforce with a singular, unified goal to produce, deliver, and use energy and utilities in the most efficient, reliable and resilient manner. ”

- Juan Ontiveros, P.E.

Associate Vice President for Utilities and Energy Management

UT Austin has set a global standard amongst their peers around the world by maintaining a reliable and sustainable power infrastructure.

Ranked among the biggest and best research universities in the United States, UT Austin is home to a combined 70,000 students, faculty and administrative staff. It offers nearly 400 degree programs. Eighty percent of the 20 million square feet on campus is dedicated to research facilities, which operate around the clock to support nearly \$600 million in contracts and research grants annually. This creates a high mandate for reliable energy. The Combined Heat and Power system in their campus, which was commissioned in 1929, has evolved steadily over the years to **self-generate 100 percent of all energy required** by the campus, with extremely high reliability and unparalleled efficiency.



Previously certified under the PEER v1 rating system, UT Austin successfully pursued **PEER Platinum recertification under Version 2** to recommit their campus to the latest standards.

KEY HIGHLIGHTS OF UT AUSTIN

The project has achieved significant benefits through energy efficiency measures. The cumulative savings achieved per annum are:

- Annual energy savings of 19 MUs
- Cost savings of 1 million USD
- 8.6 kilo tons of CO₂ mitigated

DEMONSTRATED RELIABILITY AND OPERATIONAL PERFORMANCE

As one of the largest microgrids in the United States, the UT Austin Carl J. Eckhardt - Natural Gas fired Combined Heat and Power plant (CHP), acts as the independent utility system for the whole UT Austin campus. The CHP system consists of:

CHP Plant	Description
2 Combustion Turbine Generators	134 MW of electricity generation capacity
4 Steam Turbine Generators	
18 Chillers among 5 Chilling Stations	60,600 tons of chilled water production capacity
2 Chilled Water Storage Tanks	9.1 million gallons of thermal energy storage capacity
2 Heat Recovery Steam Generators	1.2 million pounds-per hour steam production capacity
4 Boilers	

UT Austin also ties to the City of Austin's electrical grid for an emergency backup source of power. To further improve their performance, the campus has undergrounded all their electric cables and provided **100 percent redundant electrical, steam and chilled water connections** to all the buildings. The electrical connections are provided with automated restoration switches, thereby enabling their ability to automatically restore power should it be interrupted.

In addition to these efforts, the campus has a complete GIS (Geographic Information System) underground utilities map and a robust utility-locating and surveying team to help reduce the chance of accidental utility outage. The utility team has also developed an innovative software solution, which in conjunction with the SCADA system, can notify electric outage status to customers in real time.

UT Austin uses a real-time predictive monitoring system, HanPHI, to monitor the district energy system's health. As it provides the CHP plant health index and the early warning, the campus:

- Detects hidden failures in advance,
- Determines root-cause of a failure,
- Eliminates potential operational risks,
- Reduces redundant and unnecessary maintenance cost,
- Extends the equipment life cycles, and
- Increases asset reliability and efficiency.



These software-based technologies are secured via multiple firewalls and other protection systems. With all these implementations, on an average, the campus has just faced **11 minutes of sustained interruptions** in a year and **no momentary interruptions**, thus demonstrating their availability and reliability.

CUSTOMER RELATIONS AND GRID SERVICES IMPROVEMENT

UT Austin has developed an **Energy Portal** and **billing system** to support demand-side energy conservation and to present the energy consumption data from the advanced meters installed at all their buildings. The portal is easily accessible to the entire campus community, allowing users to customize visualization by building categories, energy use index, cost, energy type, environmental impact and timeframe.



All utilities are included in the automated monthly bill, including purchased utilities, such as gas and water. Energy bills are now sent to customers via email, which is an effective way to manage energy demand and help customers manage their usage responsibly.

Through its Demand Side Management (DSM) credit, PEER promotes load management and consumption strategies to help projects reduce energy demand. UT Austin, through various operational measures viz. installation of variable frequency drives (VFDs), hydraulic system improvements, and more, has achieved an energy savings of **19 million units** -- a cost savings of USD **\$1 million**. The campus has also mitigated about **8.6 kilo tons of CO₂ emissions** through the use of Optimum Energy’s LOOP control strategies in their chilling stations and thermal storage tanks.

PEER CERTIFICATION

PEER, or Performance Excellence in Electricity Renewal, is the first certification dedicated to measuring and improving power system performance. Applicable to any power system or electricity infrastructure, PEER certified systems gain a competitive advantage by differentiating their performance, documenting the value produced and demonstrating meaningful outcomes. The PEER Rating System consists of six credit categories:

- ▶ Reliability and Resiliency (RR)
- ▶ Energy Efficiency and Environment (EE)
- ▶ Operations, Management and Safety (OP)
- ▶ Grid Services (GS)
- ▶ Innovations (IN)
- ▶ Regional Priority (RP)

PEER Certification for Campus Projects	
Certified 05 May 2020	
Total Points Achieved	82
Reliability and Resiliency	23
Energy Efficiency & Environment	17
Operations, Management & Safety	20
Grid Services	15
Innovations & Regional Priority	07
Total Possible Points	110

Out of a possible 110 points, UT Austin earned **82 points**, achieving **PEER Platinum certification** under version 2 of the rating system as a campus project. Additionally, UT Austin met all the prerequisites, including reliability performance monitoring, environmental performance disclosure, system energy efficiency coefficient disclosure, triple-bottom-line analysis and load survey.

As part of the process, UT Austin identified opportunities for continuous improvement, such as reducing peak consumption and managing loads efficiently to improve their load curve and mitigating power quality events by implementing continuous power quality monitoring. These strategies have the potential to help the project further enhance their energy system performance.

About PEER

Performance Excellence in Electricity Renewal (PEER) is a rating system and certification for defining, assessing and verifying the overall sustainable performance of electricity delivery system design & operations. PEER is designed to deliver sustainable, resilient and reliable energy around the globe. Learn more @ peer.gbci.org