



MILTON S. HERSHEY MEDICAL CENTER

Platinum Certified under PEER v2

CASE STUDY

December 2021

"We are committed to a holistic framework that addresses the efficiency and effectiveness of our electrical system. Through PEER certification, we demonstrate dedication to reliability, resiliency and the environment."

- Marvin W. Smith, P.E., CHFM Assistant Vice President, Facilities Penn State College of Medicine Penn State Health Milton S. Hershey Medical Center

Penn State Health's flagship 628-bed medical center, Penn State Health Milton S. Hershey Medical Center, is central Pennsylvania's only locally based academic medical center. Founded in 1963 through a gift from The Milton S. Hershey Foundation, Penn State Health Milton S. Hershey Medical Center is one of the leading teaching and research hospitals in the country, providing high-level, patient-focused medical care.

It is well known that 'power reliability and resiliency' is vital for mission-critical infrastructure, and is a matter of life and death in the healthcare sector specifically. As healthcare providers know, a power outage or interruption affecting an intensive care unit, surgical theater, procedure room, vaccine storage area, electronically locked drug-dispensing unit or long-term care facility can do more than disrupt care and work flows; it can cause harm and cost lives.

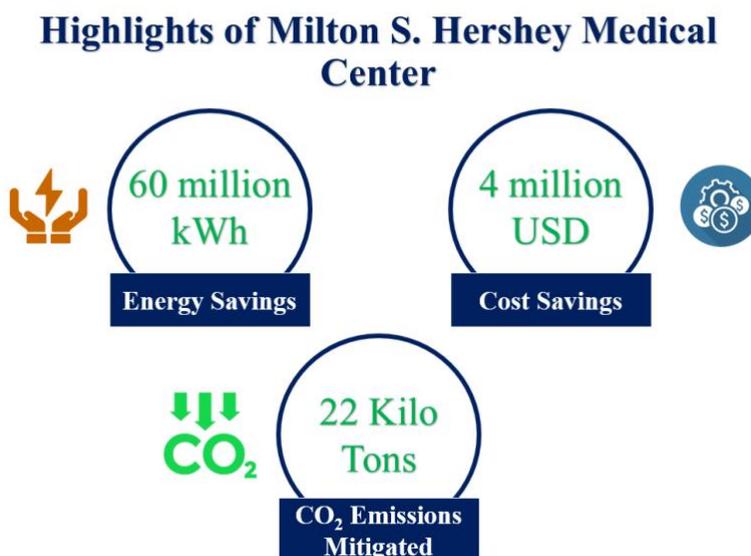


Figure 1: Highlights of Milton S. Hershey Medical Center

Thus, 'healthcare resilience' has been included as one of the core pillars of Milton S. Hershey Medical Center. As a major regional energy user, it also furthers the Center's goals to improve community health by reducing greenhouse gas emissions through more sustainable infrastructure. To evaluate their energy infrastructure and enhance its performance, the Center pursued and achieved PEER v2 Platinum certification after undergoing a rigorous certification and review process.

IMPROVING EFFICIENCY AND SUSTAINABILITY

PEER emphasizes onsite renewables, clean energy generation and efficiency enhancements to reduce their environmental impact and optimize energy.

A Combined Heat and Power (CHP), or “Cogeneration” system is a superior energy resource for hospitals because it can provide energy services efficiently and indefinitely during grid outages. For hospitals, losing electricity even for short periods can disrupt critical life support systems. And with weather-related events becoming more frequent and severe in the U.S., grid outages are becoming more common. CHP systems can enable hospitals to operate unimpeded during grid outages. In addition to providing reliable energy and improving resilience, CHP systems can help hospitals reduce costs and meet their sustainability and emissions reduction goals.

Milton S. Hershey Medical Center owns, maintains and operates a Central Utility Plant (CUP), Satellite Central Plant (SCP) and Combined Heat and Power (CHP) plant that produce chilled water used for cooling, produces steam used for heating and generates power. This district energy system consists of a Solar Taurus-70 combustion turbine, a Rentech Heat Recovery Steam Generator (HRSG) and a central chiller plant with a chilled water thermal storage.



Figure 2: CHP Plant of Milton S Hershey Medical Center

This system can produce approximate 7.9 MWh (megawatt hour) of electricity brought directly to the project site. With this CHP system in place, the medical campus was able to meet 50% of its energy requirement. Their chilled water system and steam system satisfies around 80% of the cooling and heating load requirements of the campus.



Figure 3: Central Chiller Plant and Chilled Water Thermal Storage Tank at Milton S Hershey Medical Center

This onsite district energy system has allowed the Milton S. Hershey Medical Center to save about 53 million units (or kWh) of energy and achieve cost savings of about 3.8 million USD in the year 2020. In addition to the carbon emissions mitigated (1076 tons) through waste disposal, the district energy system has also allowed the campus to mitigate about 17 kilotons of CO₂ emissions annually.

To achieve permanent reductions in their energy demand and consumption, the campus has implemented energy optimization programs such as HVAC (Heating, Ventilation and Cooling) optimization, chiller plant optimization etc., with Optimum Energy's automation platform. These energy conservation measures allowed the Milton S. Hershey Medical Center achieve energy savings of 6 million units (or kWh), and cost savings of about \$500,000. Additionally, the optimization program helped to mitigate about 3.8 kilotons of CO₂ emissions annually.

All these measures allowed the medical facility achieve a PEER Energy Efficiency and Environmental (EE) Index score of 83, higher than the Pennsylvania State's EE Index score of 45. This helps the Milton S. Hershey Medical Center travel further down the road to net zero carbon.

IMPROVING RELIABILITY AND RESILIENCE

Milton S. Hershey Medical Center has developed a reliable energy infrastructure with:



95% distribution redundant power network, implemented with auto-restoration technologies,



100% undergrounded power cables,



Alternative power supply for 100% of the project loads through the secondary feeder and onsite district energy systems,



Seamless transfer from grid-connected to island mode with the onsite district energy systems and ride-through capability.

In addition to these implementations, the campus has hardened its power system against various external threats such as tree or animal contact, vehicle or human interference and fire hazards. They also put in place infrastructure to prevent damage to their electrical equipment from flooding, storms and earthquakes, thus strengthening their resilience.

To enhance the energy infrastructure performance and ensure reliable operation, the campus has implemented several best practices, including:

- **Risk assessment** for critical power system assets
- **Preventive and predictive maintenance** procedures for asset maintenance, etc.

- **Emergency response plans/policies** to address short-term and extended power interruptions

With these measures in place, Milton S. Hershey Medical Center has achieved zero SAIDI (System Average Interruption Duration Index) and SAIFI (System Average Interruption Frequency Index), demonstrating their energy infrastructure’s reliability and resiliency.

PEER CERTIFICATION

PEER is a certification program that measures and improves power system performance and electricity delivery systems. The rating system evaluates the campus performance across six categories that include:

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

PEER Certification for Campus Projects	
Certified 18 August 2021	
Total Points Achieved	85
Reliability and Resiliency	27
Energy Efficiency & Environment	23
Operations, Management & Safety	18
Grid Services	08
Innovations & Regional Priority	09
Total Possible Points	110

Out of a possible 110 points, Milton S. Hershey Medical Center earned 85 points and achieved PEER v2 Platinum certification. As part of the process, the project identified opportunities for continuous improvements such as:

- Improving their energy mix through implementation of onsite renewable energy technologies and/or through procurement of renewable energy from offsite renewable energy plants.
- Developing a comprehensive policy on data privacy and cybersecurity to ensure secure network operation and data integrity under future grid modernization.

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