



Case Study

Union Hospital

Elkton, MD

Union Hospital had more complex and involved design requirements than most projects — so Unison Energy customized a system that is attractive, quiet, well-hidden, and meets the hospital's need for resilient, on-site power.

As the only hospital in town and the third-largest employer in the county, Union Hospital in Elkton, Maryland has long been an invaluable institution in its community. It is also one of the largest power users in the area, with some of the most critical power needs. Unfortunately, Union lacked a backup power source for their chillers — and without AC, a summertime power outage could quickly become dangerous and patient towers would need to be evacuated. Many hospital staff still remember the major wind storm in 2012 that shut down the area grid for days. The hospital lost power, with no idea when its power supply would be restored.

To mitigate utility disruptions — while cutting both energy costs and carbon emissions — the hospital engaged Unison Energy to construct, own, and operate a 1.2 MW CHP system consisting of one 1,200 kW engine that functions as a microgrid with island mode capabilities. A new Hering heat recovery steam generator now converts exhaust heat into steam, which enables more efficient space heating, while engine jacket heat is recovered to supplement the hospital's domestic hot water supply. Unison Energy provided the upfront capital, with no outside financing required, to design and build a system that offsets 87% of the site's annual electricity consumption and insulates it from harmful utility outages.

For Union Hospital, it was also a top priority that the air conditioning would be able to run during an island mode event. This presented a challenge for Unison Energy's engineers

1.2 MW of installed electric capacity, with one 1,200 kW MWM engine operating at 76% efficiency

Heat recovery 105 psi steam and domestic hot water

Three VFDs added to chillers

Load following and island mode capabilities

Carbon footprint reduced by 61% or 6,900 tons of CO₂ per year*

4,160 V operating voltage

*EPA non-baseload emissions data (eGRID 2016)



because chillers have a high inrush current during startup, and without precautionary measures this load could cause the CHP engines to trip offline. To ensure the microgrid would support the chillers during island mode, Unison Energy took the extra step of financing and installing new variable frequency drives (VFDs) from Trane on three of the existing five chillers. They temporarily took out multiple doorways and made wooden mockups of the equipment to ensure the large VFDs would fit in the limited space.

In fact, the hospital's physical constraints presented a number of design challenges. Union Hospital, which sits within the confines of a city block, had limited area available for new construction. At the same time, the hospital needed the CHP system to be quiet for patients and out of sight for visitors. Union Hospital decided to place the CHP system in front of the building, so Unison Energy constructed a custom-built wall that matched the hospital's aesthetic. The system runs at only 65 db, allowing for normal conversation immediately outside the CHP's walled enclosure. Despite the construction hurdles and custom engineering, Mark Mears, Facilities Management Director at the hospital, said, "The experience with the design team was outstanding, every step of the way."

Looking ahead to the 20-year relationship, Mears said,

"Unison was without a doubt the best company that we could have partnered with."

Operational in October 2019, Union Hospital's CHP system now runs at over 76% efficiency, offering a projected \$120,000 in first-year savings alone. And most critically, the system offers peace of mind for the patients, medical and facilities staff at Union Hospital. If the grid goes down, the hospital will engage island mode and continue supplying heat and power, ensuring the building remains operational, comfortable, and safe for staff and patients.

Unison Energy

Who We Are



We own and operate distributed generation systems that operate as microgrids.



We operate systems in CA, MD, NJ, and NY, with additional projects underway.



We finance projects on our balance sheet, with no outside capital required.



We design and implement our systems using internal engineering and project management teams.



We operate our sites using in-house field service technicians, engineers, and a 24/365 staffed monitoring center.