



# NYU LANGONE HEALTH - MEDICAL CAMPUS

**CASE STUDY**

**MARCH 2018**

# NYU Langone Health is the first medical campus in the world to achieve PEER Platinum certification.

*“NYU Langone Hospital’s – power and infrastructure was designed to provide business continuity during potentially disruptive environmental and economic forces that are likely to shape the coming decades. PEER certification has offered us an opportunity to assess the quality of our work to date, identify areas for improvement and benchmark progress against other world-class campuses, so that we can be a sustainable enterprise and deliver world-class care and research far into the future.” - Paul Schwabacher, PE, Senior Vice President, Facilities Management, NYU Langone Health.*



Figure 1. Gas turbine, Heat recovery steam generator and boilers inside the Main campus Energy building

NYU Langone Health is a world-class, patient-centered, integrated, academic medical center known for excellence in clinical care, biomedical research and medical education. The health system’s Main Campus comprises 3.2 million square feet in midtown Manhattan, including 10 interconnected buildings that provide space for in-patient acute care, medical offices, research laboratories, classroom, meeting and residential spaces. It has 80 operating rooms and procedure rooms, more than 600 staffed beds and 350 research labs; and is staffed by over 10,000 FTEs. The infrastructure that serves and connects each building ensures that the occupants – physicians, educators and researchers – have reliable power, comfort heating and air-conditioning regardless of the state of the utility grid in New York City.

## Key Highlights of NYU Langone Health – Medical Campus

- Resilient power infrastructure using CHP plant, emergency generators and boilers
- Electrical critical infrastructure elevated above 500 year flood level
- 100% undergrounded cables

## RESILIENT POWER INFRASTRUCTURE ENSURING LIFE SAFETY

The critical infrastructure of the campus includes an 11 MW Combined Heat and Power plant (CHP) with dual-fuel (Natural gas / Diesel oil as a backup) fired turbine, Heat Recovery Steam Generator (HRSG) and Steam turbine generators. Through CHP systems, the campus has substantially increased their fuel-use efficiency, reduced their emissions and reduced their purchased electricity from utility resulting in a **System Energy Efficiency Coefficient index of 80%**, achieving nearly double the improvement above benchmark.

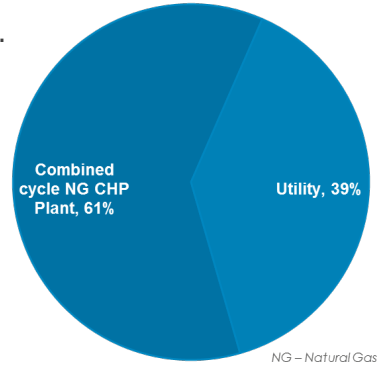


Figure 2. NYU Energy mix

In addition, back-up boilers and diesel-fired emergency power plants are also installed to support the main system in case of any failure. All the life supporting critical equipment, operating rooms, research equipment and major infrastructure are connected to automatic transfer switches and served by both primary power and backup generators. With the CHP plant, emergency generators and boilers, NYU Langone thus has the capacity to be completely **self-sufficient** in the event of a utility power interruption.

Their resilient power infrastructure thus enables the medical center to continue its important work in ensuring life safety even in worst-case scenarios and stay prepared for the likelihood of extreme weather events in coming years.

## EXCELLENT POWER SYSTEM HARDENING MEASURES

NYU Langone experienced significant challenges related to its utility services and operations during and after Hurricane Sandy in 2012 which extensively damaged much of the former campus-wide infrastructure. After Superstorm Sandy, NYU Langone worked to harden the campus, elevating critical utility and IT infrastructure above a projected **500-year flood level** adjusted to account for sea level rise from climate change. All services - from utility and on-campus primary electricity

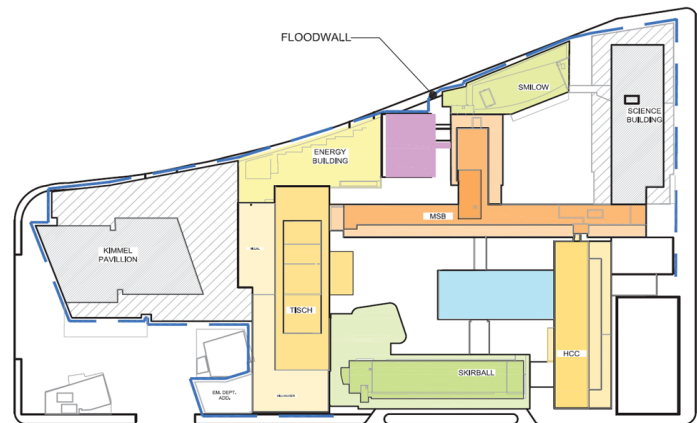


Figure 3. Perimeter protection through permanent floodwall

generation are **undergrounded** with no electrical poles or feeder lines exposed to the outer environment.

Further, NYU Langone Health was able to assess their grid infrastructure operational policies across PEER's structured framework that emphasizes on risk assessment, emergency response planning procedures, safety review protocols, predictive approaches and load management to identify areas of improvement, further improve efficiencies and prevent failures.

## CAPTURING SUSTAINABLE, EFFICIENT AND QUALITY POWER

With sustainable power, resiliency and energy management being the key focuses, NYU Langone Health's energy conservation efforts and efficient operations have created \$29 million in net savings since 2008, accomplished through energy audits, retro-commissioning, and sustainable facility design. Further, NYU has invested in upgraded infrastructure and smart building automation systems, through which they can forecast energy consumption, anticipate energy market changes, find ways to optimize electricity use during peak demand periods, thereby mitigating 67 % of their peak load that helps in maintaining a flat load profile. In addition, the focus of the medical campus on achieving excellent power quality was validated through PEER's performance outcome-based practices that evaluates the detection, continuous monitoring and corrective actions taken to mitigate poor power quality events.

## PEER CERTIFICATION

Performance Excellence in Electricity Renewal is a certification program that measures and helps improve power system performance of electricity delivery systems. Through application of PEER, projects can gain a competitive advantage by differentiating their performance, documenting the value produced and demonstrate meaningful outcomes. The PEER rating system includes four credit categories:

- ▶ Reliability and Resiliency (RR)
- ▶ Energy Efficiency and Environment (EE)

PEER Certification for Campus Projects	
Certified 22 March 2018	
<b>Total Points Achieved</b>	<b>87</b>
Reliability and Resiliency	21
Energy Efficiency & Environment	19
Operations, Management & Safety	22
Grid Services	16
Innovations & Regional Priority	09
<b>Total Possible Points</b>	<b>110</b>

- ▶ Operations, Management and Safety (OP)
- ▶ Grid Services (GS)

Out of a possible 110 points, NYU Langone Health Medical Campus earned **87 points** achieving **PLATINUM** certification under version 2 of the PEER rating system (Campus).

Thus, NYU Langone has created a power system centered on efficiency, resilience and redundancy, enabling its facilities to mitigate the impacts of utility blackouts and flooding. The comprehensive adaptation and resilience measures of the campus ensures business continuity in case of future crisis and assures their preparedness for forthcoming risks associated with climate change. PEER certification has offered the organization an opportunity to assess their resilient infrastructure through proven policies, programs and performance based outcomes, identify areas for improvement through unique key performance indicators and helped in benchmarking its progress against other world-class campuses.