

CLEAN GREEN HEALTH

BOSTON MEDICAL CENTER DRIVES COST SAVINGS WITH CLEAN ENERGY INVESTMENT

Climate change is this century's largest public health threat. The Boston Green Ribbon Commission's (GRC's) Health Care Working Group convenes leaders from all of metro Boston's major hospitals, including Boston Medical Center, to collaboratively advance energy efficiency, renewable energy, and climate resilience to deliver their significant health benefits to our communities. As a result, GRC HCWG hospitals lead their sector nationwide in public policy engagement and climate preparedness and reached more than 27 percent greenhouse gas reductions in 2017, exceeding the City's and Commonwealth's goal of 25 percent by 2020.

With the distinction of being both the Northeast's largest level-one trauma center and its largest safety-net hospital, Boston Medical Center (BMC) plays a unique role in protecting community health. Making the hospital campus as green and sustainable as possible was a natural progression in BMC's goal to make Boston "the healthiest urban population in the world," and consistent with its membership in the GRC.

The 2012 launch of a \$350 million redesign to modernize hospital facilities therefore provided an ideal opportunity for President and CEO Kate Walsh and Senior VP for Facilities and Support Services

Bob Biggio to put energy efficiency and greenhouse gas (GHG) reductions front and center. Key to that effort was development of a new energy plant to supply clean energy (as well as system redundancy for emergencies), while increasing efficiency and contributing to the hospital's goal to reduce GHG emissions by 50 percent by 2020. After reviewing several heating and cooling alternatives, BMC ultimately decided on a super-efficient, natural gas-fired cogeneration plant. Cogeneration, also known as combined heat and power (CHP), is a process where a fuel such as natural gas powers a combustion engine to generate electricity. While traditional fossil fuel power plants, which release excess heat into the atmosphere, operate at about 35 percent efficiency, cogen instead traps and reuses the "waste" heat and typically operates at 70 percent -- lowering both costs and environmental impact.

GREEN PARTNERSHIPS

The \$15 million cogen plant, which began operating in Spring 2017, was made possible by a \$3.7 million grant from the Massachusetts Department of Energy Resources' Community Clean Energy Resiliency Initiative. The Boston Public Health Commission partnered with BMC in

securing the grant, with Eversource providing additional incentives. In addition to the new cogen plant, the last few years have seen partnerships between BMC and Eversource to achieve more than 30 efficiency projects worth over eight million kilowatt hours in annual energy savings. BMC has also partnered with Veolia on a 20-year thermal energy agreement to use recycled "green steam" produced as a byproduct of electricity generation to provide heat to the hospital campus. Adding green steam to the hospital campus mix is expected to eliminate 8,500 tons of carbon emissions annually.

RELIABILITY DURING DISASTERS

BMC officials observed that while Hurricanes Katrina and Sandy wreaked havoc on most health care facilities in their paths, forcing evacuation of patients, hospitals with cogen facilities were able to stay open. BMC's new cogen plant will likewise increase the hospital's resiliency in the event of similar emergencies in Boston. The facility, located high above potential flood waters on the roof of the Yawkey Ambulatory Care Center, makes BMC the only major teaching hospital in Massachusetts with "black start" capability. This means if the electric grid goes down, the hospital can restart the cogen plant and operate as an energy "island" to heat and power its inpatient units, potentially for months at a time.

In addition to powering and heating the hospital, the cogen facility can serve as a backup power source for City and State emergency communications infrastructure.

EFFICIENCY & RESILIENCY

BMC's cogen plant will supply more than 41 percent of the hospital's electricity and has the capacity to meet 25 percent of its peak electricity demand. Cogen will save about \$1.5 million in energy and heating



BMC's Cogen Plant Will

Supply more than 41 percent of the campus' electricity

Save approximately \$1.5 million in energy and heating costs

Reduce electric grid consumption by more than 16 million kilowatt hours a year

costs and reduce annual electric grid consumption by more than 16 million kilowatt hours.

BMC has taken other important steps toward resiliency and sustainability: installing new emergency generators for inpatient buildings with cross connections, enabling a building that loses backup power to also connect to the generator of an adjacent building; programming elevators to stop short of lower floors to maintain patient care in the event of a flood; and executing a significant solar energy power purchasing agreement.

Named by Becker's Hospital Review as one of America's 50 greenest hospitals, BMC is on track to become the first carbon-neutral hospital in New England in 2018. Shrinking the campus footprint by 400,000 square feet through the redesign process is projected to rein in annual energy and operating costs by approximately \$25 million - funds BMC will be able to direct to patient care. By reinvesting energy savings in better clinical care, research and more energy efficiency, BMC aims to serve as an model for all hospitals across the country looking to become healthier, greener and more efficient.



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The Boston Green Ribbon Commission is a group of business, institutional, and civic leaders in Boston working to develop shared strategies for fighting climate change in coordination with the City's Climate Action Plan. Learn more at www.greenribboncommission.org.