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Combined Heat and Power Provides Energy Resiliency to Medical Facilities

Improvements to Current Tax Credits Can Keep Operations Running, Save Fuel and Money

Overview

Recent electrical grid failures related to storms, overloads, and security breaches have brought renewed attention to electricity system reliability, particularly for critical safety and medical infrastructure. It is imperative that hospitals have the power they need to deliver essential public safety and response services during outages and other emergencies. Facilities equipped with combined heat and power (CHP) systems have an established record of providing reliable off-grid power during major disruptions and are important components of hospital resiliency plans that also lower utility costs.[1]

CHP is a distributed power resource that generates electricity and thermal energy through a single on-site system that captures heat wasted during electricity generation. CHP produces both heat and power from a single fuel source. Such systems are ideal for hospitals, where round-the-clock operations require a constant supply of hot water and electricity.

Lives can be saved by emergency preparations that prevent medical facility evacuations caused by power outages. Moving patients from one location to another can disrupt medical care and routines, increasing the risk of hospitalization and even mortality.[2] According to a report from the *American Journal of Alzheimer's Disease & Other Dementias*, death rates for seniors rose 218 percent within 30 days of an evacuation and 158 percent within 90 days.

Hospitals reap important benefits from CHP systems

Nationwide, some hospitals have strategically deployed CHP to support a variety of institutional goals, from energy resiliency to cost savings to emergency preparedness.[3]

CHP technologies offer a dependable source of power and increase a facility's resiliency by boosting off-grid operation capabilities, ensuring that critical operations are uninterrupted. Hospitals with CHP have no need to operate stand-alone emergency generators, which often become abandoned assets because of infrequent use. When the grid goes down, hospitals with CHP are islands of power, offering refuge for emergency workers, displaced people, and patients evacuated from medical facilities that lack power.[4] CHP supports emergency features such as black start capability (i.e., restoring power without relying on the grid), operations that are independent from the grid, and seamless transitions from on- to off-grid power, ensuring reliable uninterrupted patient care and protecting vital assets such as medical research facilities, diagnostic labs, and pharmaceutical supplies.[5] These highly efficient systems also allow hospitals to run at greater capacity during grid failures when they might otherwise be using less-efficient emergency generators that supply a reduced load of electricity.[6]

CHP systems also save money and decrease emissions through reductions in energy grid purchases while ensuring better patient outcomes. They can be up to 85 percent efficient, whereas traditional power generation systems are often only 33 percent efficient. According to a recent report, adding a 1-megawatt CHP system can save a hospital up to $700,000 annually through increased efficiency.[7]

Energy Star CHP Awards

The U.S. Environmental Protection Agency has honored medical facilities nationwide for their use of extremely efficient Energy Star-rated combined heat and power systems. The honorees include:

- Medical Area Total Energy Plant, Boston (2013, 46 MW CHP).
- Montefiore Medical Center, New York (2013, 11 MW CHP).
- Shands Cancer Hospital, University of Florida, Gainesville (2010, 4.3 MW CHP).
- Eastern Maine Medical Center, Bangor (2010, 4.4 MW CHP).

Health care sector is an established market with additional opportunities

CHP systems provide over 82 gigawatts of generation capacity at more than 4,100 facilities in the United States, of which more than 130 are nursing facilities and 220 are hospitals. In 2013, 9 percent of existing CHP capacity was in hospitals.[8] But more can and should be done.

Upfront capital costs remain a barrier

CHP systems need upfront financing to cover the cost of equipment, installation, and regulatory or permitting fees. Once systems are operational, initial investments are typically recovered through savings from lower energy costs over the life of the equipment. Incentives, such as the federal investment tax credit (ITC) for industrial energy efficiency projects, can lower investment paybacks, but the current ITC requirements are restrictive, allowing only some projects to qualify. Because not-for-profit hospitals do not generally pay taxes, they cannot directly take advantage of the ITC. Still, hospitals can enter into an arrangement with a qualifying third party that installs, owns, and operates the CHP system. The third party, which can file for the ITC, then sells the electricity back to the hospital under a power purchase agreement or similar arrangement, allowing facilities to leverage tax and other advantages that would not be available directly to nonprofit entities.

Policy updates are needed

In 2013, President Barack Obama established the Hurricane Sandy Rebuilding Task Force, which made energy resiliency a top priority. CHP was identified as an effective approach to significantly increase building and community access to energy during grid failures. The task force found the systems to be such an essential component of those efforts that a guide was produced to raise awareness and educate developers, critical facilities, and the public on the role of CHP technology in emergency planning.[9] In the Northeast, the mid-Atlantic, Texas, and Louisiana, hurricane damage has been a catalyst for adoption of state-based policies that seek installation of CHP systems to support critical infrastructure, including medical facilities, during emergencies.

Because of the ability of CHP to help save lives, reduce costs and pollution, withstand extreme weather, and operate during blackouts, its adoption should be encouraged at all medical facilities and other buildings that provide critical services to communities.

However, health care facilities face financial barriers to investing in these systems. Improving the ITC for industrial energy efficiency can go a long way toward increasing adoption of CHP. Currently the credit is limited to 10 percent for the first 15 MW of a project's total size. These limits prevent large industrial users such as medical facilities from accessing the tax incentive. With small modifications to the ITC, such as removing restrictions and setting flexible incentives, more major energy users could install these systems, making them more efficient, productive, and competitive.

Endnotes

1 Boston Green Ribbon Commission and Health Care Without Harm, *Powering the Future of Health Care: Financial and Operational Resilience: A Combined Heat and Power Guide for Massachusetts Hospital Decision Makers* (2013), http://www.greenribboncommission.org/downloads/CHP_Guide_091013.pdf.

2 Jason Oliva, "Nursing Home Resident Mortality Rates Skyrocket 218% Following Evacuation," *Senior Housing News*, Nov. 28, 2012, http://seniorhousingnews.com/2012/11/28/nursing-home-resident-mortality-rates-skyrocket-218-following-evacuation/.

3 Boston Green Ribbon Commission and Health Care Without Harm, *Powering the Future of Health Care*.

4 Department of Housing and Urban Development, "Hurricane Sandy Rebuilding Task Force Releases Rebuilding Strategy," news release, Aug. 19, 2013, http://portal.hud.gov/hudportal/HUD?src=/press/press_releases_media_advisories/2013/HUDNo.13-125.

5 Boston Green Ribbon Commission and Health Care Without Harm, *Powering the Future of Health Care*.

6 Ibid.

7 Ibid.

8 Ibid.

9 U.S. Department of Energy, U.S. Department of Housing and Urban Development, U.S. Environmental Protection Agency, *Guide to Using Combined Heat and Power for Enhancing Reliability and Resiliency in Buildings* (2013), https://www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_for_reliability_guidance.pdf.

For further information, please visit:

pewtrusts.org/industrialefficiency

Contact: Jessica Lubetsky, officer, clean energy
Email: jlubetsky@pewtrusts.org
Phone: 202-540-6356
Project website: pewtrusts.org/industrialefficiency