Chapter 6. Emerging Market Opportunities

6.1 CHP in Critical Infrastructure Applications[179]

6.1.1 Overview

The U.S. electric power system is vast and complex, with thousands of miles of high-voltage cable that serve millions of customers around the clock, 365 days per year. Although normally this "instant" supply of electricity is taken for granted, terrorist attacks and natural disasters remind us how dependent we are on electricity and how fragile the grid can be. Water systems; oil and gas pipelines; communications systems; residential, commercial, industrial, and institutional buildings; transportation; health systems; emergency operations; and nearly every other category of critical infrastructure is in some way dependent on electricity.

Critical infrastructure collectively refers to those assets, systems, and networks that, if incapacitated, would have a substantial negative impact on national or regional security, economic operations, or public health and safety.[180] These applications include hospitals, water and wastewater treatment facilities, financial institutions, police and security services, and places of refuge.[181] Facilities that may serve as places of refuge include, but are not limited to—schools, colleges, and universities; armories; government buildings; hotels and convention centers; and sports arenas. Prior to September 11, 2001, emergency management planning focused primarily on preparedness and response—that is, what happens at the moment of an emergency and in the minutes, hours, days, and weeks thereafter. In the years since 2001, however, the idea of infrastructure resilience in key assets, systems, and functions—that is, the ability to maintain operations despite a devastating event—has become a key principle in disaster preparedness.

How does CHP Fit into Critical Infrastructure Applications?

CHP offers the opportunity to improve and contribute to critical infrastructure (CI) resiliency, mitigating the impacts of an emergency by keeping critical facilities running without any interruption in service. If the electricity grid is impaired, a properly configured CHP system can continue to operate, ensuring an uninterrupted supply of power and heat to the host facility. The installation of CHP systems at select CI facilities could increase the ability of these facilities to ride through a prolonged electrical grid outage; and the uninterrupted functioning of critical facilities would increase the resiliency of the surrounding community. CI facilities are typically outfitted with backup generators to take over the supply of electricity for on-site needs in the case of a grid failure; however, CHP systems have several advantages over backup generators. In some sectors, such as hospitals, the presence of a CHP system may not override the necessity of having a backup generator, which is required by current law. CHP systems, however, provide benefits to their host facilities all the time, rather than just during emergencies. Some advantages that CHP systems have over backup generators include the following:

- Backup generators are seldom used and are sometimes poorly maintained, so they can encounter problems during an actual emergency; CHP systems run daily and are typically highly reliable.
- Backup generators typically rely on a finite supply of fuel on site,[182] often only enough for a few hours or days, after which more fuel must be delivered if the grid outage continues. CHP systems have a more reliable source of fuel on demand.
- Backup generators may take time to start up after grid failure, and this lag time, even though it may be quite brief, can result in the shutdown of critical systems. Also, in many cases, backup generators must be delivered to the sites where they are needed, leading to further delays in critical infrastructure recovery.

[179] National Association of State Energy Officials (NASEO). *State Energy Assurance Guidelines*. December 2009. http://naseo.org/eaguidelines/State_Energy_Assurance_Guidelines_Version_3.1.pdf.

[180] Patriot Act of 2001 Section 1016 (e).

[181] "Places of refuge" is a commonly used term in the realm of emergency planning. See, www.iupui.edu/~prepared/procedures/shelter and www.purdue.edu/emergency_preparedness/faq.htm.

[182] Some backup generators run off natural gas as well.

CHP systems are the consistent baseload source of electricity for the site they serve, and if properly sized and configured, are impacted by grid failure.

- Backup generators typically rely on reciprocating engines burning diesel fuel, an inefficient and polluting method of generating electricity.[183] CHP systems typically burn natural gas, a cleaner fuel, and achieve significantly greater efficiencies, lower fuel costs, and lower emissions by capturing waste heat. Moreover, CHP systems are capable of using multiple fuels, which makes them that much more versatile in emergency situations.
- Backup generators only supply electricity; whereas, CHP systems supply thermal loads as well as electricity to keep facilities operating as usual.
- The economics of operating a CHP system on-site, especially if allowed to obviate the need for a backup generator, may prove more favorable than procuring and operating a backup generator solely during emergencies.

The requirements for a CHP system to deliver power reliability, as in a critical infrastructure facility, are fairly straightforward, but they may add some costs relative to CHP in a non-critical facility.

6.1.2 Benefits of Successful Implementation Approaches

Following the terrorist attacks in 2001; the Northeast blackout in 2003; and natural disasters such as Hurricane Katrina in 2005, Hurricane Ike in 2008, and Superstorm Sandy in 2012, disaster preparedness planners have become increasingly aware of the need to protect critical infrastructure facilities and to better prepare for energy emergencies. Resilient critical infrastructures enable a faster response to disasters when they occur, mitigate the extent of damage that communities endure, and speed the recovery of critical functions. CHP can answer this need while making energy more cost- and fuel-efficient for the user, as well as more reliable and environmentally friendly for society at large. The use of CHP systems for critical infrastructure facilities can also improve overall grid resiliency and performance by removing significant electrical load from key areas of the grid. This is possible when CHP is installed in areas where the local electricity distribution network is constrained or where load pockets exist. The use of CHP in these areas eases constraints and load pockets by reducing load on the grid. To ensure continued progress towards addressing grid and critical infrastructure resiliency via technologies such as CHP, improved coordination between government emergency planners and the electricity sector must occur.

There are a variety of examples of CHP systems in hospitals that have continued operating throughout grid failures enabling the hospital to continue serving the community[184] Even though sustaining hospital operations is always a high priority, it is perhaps one of the highest and most widely recognized priorities during emergency incidents. It is imperative to ensure that hospitals function during an incident to provide essential emergency response services. The following examples provide insight into how hospitals can serve this critical function.

South Oaks Hospital (Long Island, New York). South Oaks Hospital originally installed its 1.3 MW CHP system to reduce energy costs; however, reliability has been a large advantage of having CHP. The system is grid-connected but can operate off the grid during emergencies. During the major northeast blackout in August 2003, South Oaks never lost power, while the area around the hospital lost power for 14 hours. Employees were not even aware of the blackout at first because they saw no interruption in their service. During the recent Superstorm Sandy, the hospital continued to operate as usual and was able to receive patients from other facilities that were without power due to the failure of backup generators. About 30 psychiatric patients from South Beach Psychiatric Center on Staten Island were shifted to South Oaks.[185]

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[183] Some backup generators have installed environmental controls to help reduce emissions.

[184] U.S. Department of Education/Oak Ridge National Library. "CHP Enabling Resilient Infrastructure: Powering Through Superstorm Sandy." March 2013.

[185] www.medicaldaily.com/articles/12942/20121030/hospitals-emergency-mode-hurricane-sandy-death-toll.htm#qePwdJUKkUWvTRtm.99.

Montefiore Medical Center (Bronx, New York). Montefiore has a 14 MW CHP system that generates almost all of the electric and thermal needs of the facility.[186] In advance of Superstorm Sandy, a command center was set up and connected to the NYC Office of Emergency Management. Twenty patients were seamlessly transferred from NY Downtown Hospital, and as the storm and its effects worsened, additional patients were taken in from NYU Langone, Bellevue Hospital, and nursing homes across the region. Montefiore was the only institution in the area that kept its outpatient services open on both days, and residents and faculty kept the teaching clinics fully staffed. During the Northeast blackout in August 2003, Montefiore was reportedly the only hospital in New York City that continued to admit patients, perform surgeries, and continue normal operations.[187] At the time of the blackout the hospital was fairly full and did not have a large number of open beds, but non-critical patients were discharged to make room for patients from other facilities, including those dependent on life support equipment that required power. The hospital's lobbies became a refuge for elderly people in the neighborhood who needed to cool off in the air conditioning. The cafeteria also remained open and was able to serve food late into the night to local residents, policemen, and service personnel.

A variety of facilities from several different sectors may be identified as potential places of refuge, and these facilities can play a crucial role in supporting public health and safety. These facilities possess attributes that suit them for a role as places of refuge. They can provide accommodations for large numbers of people, are widely distributed in communities, and typically possess kitchens and sanitary facilities, which are required to sustain people dislocated during a crisis.

Salem Community College (Salem County, New Jersey). Serving as a Red Cross Disaster Relief Shelter, Salem's CHP system consists of three Capstone C65 microturbines that provide heating, cooling and emergency power to the critical facility. During Superstorm Sandy, the shelter was fully operational as it was continuously powered and heated by the CHP system. The shelter took in a peak of about 80 to 90 residents between Monday and Tuesday.[188]

New York University (New York City). During Superstorm Sandy, approximately 6,000 of New York University's students found themselves in dorms without power. After 48 hours without power due to the storm, those who could not find refuge with friends in dorms with power or elsewhere in the city were ordered to evacuate on Wednesday and spend the night in the Kimmel Center, NYU's student life building. The Kimmel Center's CHP plant kept the lights on and the heat and water running for displaced students. The second floor of the building became a temporary health center, as NYU's permanent health center was closed. The power provided by the CHP plant also allowed the university to distribute hot meals. Five NYU dorms (such as Goddard Hall, which also runs on power from NYU's CHP system) that still had power also became centers of refuge, as displaced students were allowed in to sleep on floors and in hallways.[189, 190]

Additionally, Superstorm Sandy resulted in considerable disruption to businesses. The economic research firm Moody's Analytics attributed almost $20 billion in losses from suspended business activity.[191] For example, Wall Street's extended closure included a two-day shutdown of the New York Stock Exchange, which halted financial market trading at a cost of about an estimated $7 billion. CHP systems located at data centers and at other corporate locations can help prevent significant interruptions in normal business operations.[192]

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[186] PR Newswire. "Clean NYC Energy Project Honored by the Association of Energy Engineers." June 27, 2012. www.prnewswire.com/news-releases/clean-nyc-energy-project-honored-by-the-association-of-energy-engineers-54944777.html.

[187] Midwest CHP Application Center. *Combined Heat & Power for Minnesota Healthcare Facilities*. Jan. 8, 2004. http://gulfcoastcleanenergy.org/Portals/24/Events/Hospitals%20Audiocast/CHP_haefke_StPaul_MN.pdf.

[188] www.nj.com/salem/index.ssf/2012/10/salem_county_deals_with_afterm.html.

[189] www.thedailybeast.com/articles/2012/11/01/inside-the-nyu-refugee-camp-for-displaced-students.html.

[190] Midwest CHP Application Center. *Combined Heat & Power for Minnesota Healthcare Facilities.* Jan. 8, 2004. http://gulfcoastcleanenergy.org/Portals/24/Events/Hospitals%20Audiocast/CHP_haefke_StPaul_MN.pdf.

[191] http://money.cnn.com/2012/10/29/news/economy/hurricane-sandy-business/index.html.

[192] www.osborneadvisors.com/HOT-TOPIC-Disastrous-Sandy-The-Financial-Effects-of-a-Historic-Storm.c4293.htm.

Public Interest Network Services (Manhattan, New York). The Public Interest data center provides hundreds of companies with office communications support. It is connected via three different fiber networks to multiple carriers for voice calls, provides multiple tier-1 Internet backbone operators, and is protected against power failure by a full-scale Uninterruptible Power Supply (UPS) and combined heat and power system. The 65 kW microturbine based CHP system provides for all of the computer and office lighting electric loads as well as providing space cooling from absorption chillers. During Superstorm Sandy the power to the building and surrounding area was out for more than two days, however the data center was able to remain fully operational. The CHP system was even able to provide the building landlord with power to continue to run their computer and security systems.[193]

6.1.3 Successful Implementation Approaches

States with Critical Infrastructure Policies that Include CHP

Texas. Texas bills HB 1831 and HB 4409[194] require that beginning in September 1, 2009, all government entities (including all state agencies and all political subdivisions of the state such as cities, counties, school districts, institutes of higher education, and municipal utility districts) must do the following:

- Identify which government-owned buildings and facilities are critical in an emergency situation.
- Prior to constructing or making extensive renovations to a critical governmental facility, the entity in control of the facility must obtain a feasibility study to consider the technical opportunities and economic value of implementing CHP.

This legislation was enacted because of several major natural disasters (hurricanes Katrina, Rita, and Ike) that showed the vulnerability of the state's critical infrastructure. It was found that these natural disasters could knock out portions of the electric grid for weeks and backup generators were not reliable. Texas has found that the high pressure pipeline system that supplies natural gas throughout the state has provided highly reliable service throughout recent hurricanes. Underground natural gas pipelines provide a secure source of energy to on-site CHP systems, which can then deliver electricity, steam, and chilled water securely throughout the facility.

To determine whether a government building or facility is critical, it must meet the following criteria:

- Owned by the state or a political subdivision of the state
- Expected to continue serving a critical public health or safety function throughout a natural disaster or other emergency situation, even when a widespread power outage may exist for days or weeks
- Continuously occupied and maintain operations for at least 6,000 hours each year
- Have a peak electricity demand exceeding 500 kilowatts.

Examples of government buildings and facilities that may meet the 'critical' definition include hospitals, nursing homes, command and control centers, shelters, prisons and jails, police and fire stations, communications and data centers, water or wastewater facilities, research facilities, food preparation or food storage facilities, hazardous waste storage facilities, and similar operations.

Louisiana. On June 1, 2012, the Louisiana Legislature passed resolution No. 171, which requests that the Department of Natural Resources and the Louisiana Public Services Commission establish guidelines to evaluate CHP feasibility in critical government facilities. Critical facilities are defined as command and control centers, hospitals, shelters, prisons, jails, police and fire stations, communications centers, data centers, and water and wastewater facilities, among others. Important criteria for CHP feasibility include being operational 6,000 hours per year and having a peak electricity demand exceeding 500 kW. CHP may be deemed feasible if it can provide a facility with 100% of its critical electricity needs, can sustain emergency operations for at least 14 days, and has

[193] www.cornerstonetelephone.com/about.

[194] www.txsecurepower.org.

60% efficiency. The energy savings must also exceed installation, operating and maintenance costs during a 20-year period.[195]

New York. The State Energy Research and Development Authority (NYSERDA) has been a strong supporter of CHP technology development and implementation for more than 10 years. NYSERDA recently partnered with the New York State Office of Emergency Management to educate the state's emergency managers about CHP so that it can be included in strategic plans for emergency and place of refuge facilities.[196] The purpose of this effort was to provide the "connecting links" between national homeland security efforts and regional/state infrastructure resilience activities.

The final report[197] detailed the CHP potential in critical infrastructure applications in New York and provided outreach information to these sectors (e.g., hospitals, water treatment plants, financial institutions, places of refuge) to present the benefits of CHP to infrastructure resiliency.

How the Criteria Are Addressed

Policy Intent. States and other local governments are developing policies to include CHP in critical infrastructure planning to ensure the energy security and reliability of emergency facilities. A focus on infrastructure resilience instead of protection suggests that critical infrastructure security is most enhanced by investing resources in such a way that no matter what the attack or disaster, as much of the nation's critical infrastructure system as possible will remain functional, and that those parts of the system that are compromised will resume functionality in as short a time as possible. In this context, the value of CHP to infrastructure resiliency becomes clear, with careful attention to the ways in which the various sectors of the nation's infrastructure are dependent upon electricity; critical assets across sectors can be insulated from disruption to the grid through the use of CHP and other forms of distributed energy. Focus can be placed on the crucial points of infrastructure interdependence, where relatively small investments in distributed energy provide marked increases in the resilience of our nation's system of critical infrastructure.

Market Signals. Including CHP in critical infrastructure facilities as a priority in state and local emergency planning activities can greatly incentivize development of this resource. The increased occurrence of blackouts and extreme weather events that affect the grid can also serve as clear market signals by costing millions of dollars in lost revenues to facilities without a reliable source of backup power.

Ratepayer Indifference. The costs associated with incorporating CHP into critical infrastructure planning still needs to be evaluated further to ensure they are lower cost than alternatives, on a lifecycle basis. However, there is a strong history of economically-sound CHP systems that have helped hospitals and critical industrial facilities to continue operating in the face of an emergency, while also providing financial savings during non-emergency operation.

6.1.4. Conclusions

Successful application of CHP in critical infrastructure sectors will depend on overcoming institutional barriers, and engaging the support of decision-makers who build, manage, and operate these facilities. An element of "out-of-the-box" thinking is also required as the needs of our infrastructure evolve to contend with growing and changing risks. Emergency management professionals are an additional key group that must be engaged in the effort, for they provide a gateway to their stakeholders who play an important role, at the local level, in developing emergency response plans and taking action when needed. To ensure continued progress towards addressing grid and critical infrastructure resiliency via technologies such as CHP, improved coordination between government

[195] http://files.harc.edu/sites/gulfcoastchp/newsletters/Newsletter_20120626.pdf.

[196] Pace Law School. Newswire. August 2011. http://newswire.blogs.law.pace.edu/2011/08/30/thomas-bourgeois-deputy-director-of-the-pace-energy-climate-center-on-keeping-power-flowing-to-critical-infrastructure-in-the-wake-of-natural-disaster.

[197] www.nyserda.ny.gov/en/Publications/Research-and-Development/~/media/Files/Publications/Research/Other%20Technical%20Reports/nyserda-chp-final-report-optimized.ashx.

emergency planners and the electricity sector must occur. State utility regulators and other state policymakers can facilitate that coordination and help reduce regulatory barriers to CHP so that these systems can be more easily installed in critical infrastructure applications.

6.2 Emerging Market Opportunity—Utility Participation in CHP Markets

6.2.1. Overview

A significant policy option for increasing installed CHP capacity may be to allow incumbent natural gas and electric utilities to participate in CHP markets. Utility participation may take many forms. A utility could own CHP facilities directly on the customer side of the meter or provide packages of services to customers who own their own CHP, or it could incorporate combined heat and power solutions into ratepayer-funded efficiency programs.

Today, utilities are constrained in the provision of CHP services. Most do not have the regulatory approval to build and own CHP facilities. Neither do most have the flexibility to negotiate custom service packages for customers who own their own CHP systems. This represents a significant barrier to the growth of cost-effective CHP because incumbent utilities are uniquely positioned to facilitate new CHP development. Utilities understand CHP technology, which has been present in the market about as long as central station power supply. They generally are very familiar with their customers' process needs and concerns. Utilities may be in a unique role to assume the risk and responsibility of installing and maintaining a complex energy system so that the customer can concentrate on its primary mission or business—they may also be able to accept longer paybacks and lower internal rates of return than their customers. Direct support could involve investments in equipment and infrastructure over a long investment horizon, a proposition that aligns with the utility business model. Utilities understand their own delivery systems—where new energy capacity is needed and where CHP can provide the most benefits to the system. Allowing or enabling utilities to participate in CHP markets may be a way to stimulate cost-effective CHP development and provide system benefits.

There are various ways in which a utility can participate in CHP markets depending on the regulatory environment. A utility can build and own CHP facilities, it can negotiate a custom package of services to support a CHP customer who owns his own CHP, or it can support CHP customers pursuant to a system of regulatory incentives. In some states utilities are pursuing CHP as part of ratepayer-funded energy efficiency programs.

Considerations for utility participation in CHP markets may include the following:

- Rules to ensure non-discriminatory access by third parties wishing to enter the CHP market in the utility's service territory and compete with i
- Financial controls to prevent the utility from shifting costs from its CHP products and services to the revenue requirements of non-CHP customers
- A policy determination about how to treat CHP-related earnings for rate making purposes (e.g., either imputing CHP earnings as offsets to required revenues, or allowing the utility to retain CHP earnings). Policy may differ for utilities in restructured versus traditional electricity markets.
- Models for joint utility-customer ownership of CHP assets or utilization of utility service performance contracts
- Allowing for utility incentives for CHP, including innovative financing mechanisms, discounted natural gas rates, or utility partnerships with government.

6.2.2. Successful Implementation Approaches

Alabama Power Company

The Alabama Power Company works with individual customers to manage their rates and loads. This includes considering CHP options, where feasible. For CHP options to be viable for Alabama Power support, they must offer benefits for the individual customer, for all other customers on the system, and for the utility. Alabama Power, its customers, and the Alabama Public Service Commission have worked together successfully to find such "win-win-win" projects.

Today, there is approximately 2,000 MW of CHP on the Alabama Power system. Approximately 1,500 MW is customer-owned and more than 500 MW is company-owned and operated at large industrial sites. Customer-owned generation has allowed Alabama Power to avoid building approximately 1,700 MW of central station capacity, which has benefitted all customers. During the 1990's when the utility needed to add new generation to reliably meet the load obligations of its customers, Alabama Power was able to develop new generation resources near certain customer facilities based on combined heat and power. By having the ability to work with these customers and having a flexible regulatory process, these new generation facilities were certified by the Alabama Public Service Commission through its regulatory process. This certification process allowed the non-steam aspect of these generation facilities to be allowed in rate base.

Due to the impacts of the recession and the development of other cost-effective energy efficient measures, Alabama Power does not have a reliability-based need for new generation for the rest of this decade. Nevertheless, given the flexibility allowed under Alabama's regulatory process, the utility was able to recently certify two purchase power agreements from customer-owned CHP facilities. Alabama allows projects that offer extraordinary value to be certified even if there is not an immediate need. The company was able to negotiate prices, terms and conditions of these two purchase power agreements that captured extraordinary benefits for all of its customers. Due to the uniqueness of each CHP application, a custom service agreement between the customer and the utility must be negotiated for each project to go forward.

Philadelphia Gas Works (PGW)

The municipal gas utility in Philadelphia, PA, PGW provides an example of a natural gas utility serving a central role in developing a CHP technology solution for one particular customer. PGW worked closely with the Four Seasons hotel, in downtown Philadelphia, to develop an efficient solution to meet the hotel's energy needs. Working closely with PGW representatives, the hotel evaluated the project requirements and identified CHP as a viable solution that would offer savings at a reasonable payback. PGW provided assistance with project evaluation and engineering, and introduced the hotel to the microturbine technology solution it would eventually utilize. The project identified that three 65kw natural gas fired microturbines could provide 100% of the building's day-to-day domestic hot water, 25% of its electric, and 15% of its heating needs.

The upfront cost of the project remained a hurdle. To address this, PGW developed a business scenario where it would provide $1.2 million for an upfront capital incentive for the purchase and installation of the CHP unit on-site at the Four Seasons. The hotel posted a letter of credit to keep PGW and Philadelphia ratepayers whole. PGW was then able to recover the costs of the incentive through a surcharge on the hotel's energy bill. Full recovery of incentive costs to PGW was calculated to take three years. After PGW cost recovery, the customer enjoys the benefits of the energy savings during the lifetime of the CHP equipment. The arrangement required coordination between PGW representatives, its Board of Directors, the Philadelphia Gas Commission, and the customer.

Baltimore Gas and Electric (BGE)

Maryland utilities support CHP implementation by using incentives through their ratepayer-funded energy efficiency programs. As an example, BGE supports qualified projects as part of its Combined Heat and Power Program by providing incentives for industrial and commercial customers who install an on-site CHP system. The primary objective is to encourage the use of CHP to support the EmPOWER Maryland energy efficiency initiative which seeks to reduce per capita energy and demand use by 15% by 2015. The program is limited to projects where the full CHP capacity is used on-site, that meet BGE's cost effectiveness requirements and have an overall minimum efficiency of 65%. Projects that qualify can receive up-front incentives for design and installation, and a production incentive for 18 months of operation of the system after commissioning. The total incentive cannot exceed $2 million.

New Jersey Natural Gas (NJNG)

NJNG has a Fostering Environmental and Economic Development (FEED) program designed to provide financial assistance for energy-efficiency upgrades and economic development opportunities for commercial and industrial customers. FEED will provide access to investment capital, incentives, and/or discounted rates to encourage the installation of energy-efficient equipment, including combined heat and power projects, as well as business growth, expansion, and retention in the state. Upfront funding will be provided by NJNG with the principal and interest repaid by the customer over an agreed upon period of time. Long term, fixed price contracts for the purchase of natural gas are also available under FEED. This program provides no risk to ratepayers and no associated costs will be recovered through NJNG's rates.

Other Examples

- Examples of joint ownership of CHP assets in the ethanol industry include Missouri Ethanol LLC in Laddonia, MO, a 45 million-gal/yr ethanol plant that began operation in September 2006. The plant uses approximately 5 MW of power and 100,000 lbs/hr of steam. It is one of two ethanol plants in the state that employ gas turbine-based CHP through a utility-ethanol plant partnership. The CHP system is comprised of a 14.4 MW Solar Titan gas turbine and an unfired heat recovery steam generator (HRSG). The CHP system is jointly owned by Missouri Ethanol and the Missouri Joint Municipal Electric Utility Commission (MJMEUC)—a statewide joint action agency that supplies power and capacity services to 56 municipal Missouri utilities. The Missouri Ethanol project is patterned after an earlier CHP partnership between the City of Macon, MO, and the Northeast Missouri Grain LLC ethanol plant in Macon. In both Macon and Laddonia, the utilities own and are responsible for gas turbine operation. However, the ethanol plants own and are responsible for the heat recovery equipment, including the HRSGs and downstream steam systems. Natural gas costs are shared between the utilities and ethanol plants in both cases. The Missouri Public Utility Alliance (MPUA) views the Laddonia project as a 'win-win-win' effort, as it provides a cost-competitive power supply for MJMEUC, reduced steam costs for the ethanol plant and additional baseload gas demand for the Missouri Municipal Gas Commission. In addition to these benefits, the project directly supports a number of MPUA goals, including increasing the diversity of its supply portfolio, increasing local control of supply assets and promoting economic development for rural Missouri.[198]
- Austin Energy, a municipal electric utility in Texas, is sole owner and operator of a 4.5 MW CHP plant that is used to power, heat and cool a number of buildings, including IBM Research Labs, in the Domain industrial park in northwest Austin. Austin Energy has characterized this plant as a "mini-grid solution," and a response to increasing demands on Austin's power generation assets. Austin Energy also owns and operates a 4.4 MW CHP system at the Dell Children's Medical Center; the system provides 100% of the hospital's power, heating, and cooling needs.
- Gainesville Regional Utilities owns and operates the South Energy Center, a 4.3 MW natural gas fired CHP system that serves the Shands Cancer Hospital at the University of Florida with 100% of its energy needs.
- Ameren developed and formerly owned and operated a 44 MW CHP facility in Mossville, Illinois, through a non-regulated subsidiary, Ameren Energy Medina Valley Cogen LLC. The system produces electricity, steam, and chilled water for the adjacent Caterpillar engine manufacturing facility.

[198] District Energy Magazine. "Utility-Ethanol Partnerships: Emerging Trend in CHP." 2nd Quarter 2007. International District Energy Association.