# BCHP Baseline Analysis for the Illinois Market
# 2002 UPDATE

**Prepared by:**
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**University of Illinois at Chicago – Energy Resources Center**

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# Table of Contents

## Executive Summary

In August 2001 the Midwest CHP for Buildings Application Center (MAC) completed its original Illinois Baseline Analysis, which detailed the regulatory and private sector activities in the Buildings Combined Heat and Power (BCHP) market in the state. That baseline analysis concluded that there was a significant need to improve the regulatory environment for BCHP systems and educate state regulators and private firms on the benefits of BCHP technologies. In the year since that baseline analysis there has been enough development in the BCHP field in Illinois to prompt an update of the original study.

Since last year several BCHP facilities have been installed in the state including a 1.2 MW facility at an office complex in downtown Chicago (Equity Office Properties), a 36 MW facility at the University of Illinois at Chicago and a 2.5 MW facility at the Research Center of the GasTechnology Institute. Furthermore construction was started on a 57 MW cogeneration facility at the University of Illinois at Urbana Champaign.

Lately, several groups have been particularly active in promoting BCHP technologies in Illinois. This includes the Midwest CHP Initiative, an interest group consisting of regulators and private industry representatives, which meets on a bimonthly basis. The Midwest CHP Initiative organized a one day distributed generation interconnection workshop in February 2002 for state utility regulators in the Midwest. The Illinois Commerce Commission attended this workshop. Another active BCHP interest group is the "Joint Task Force Committee of the Midwest Cogeneration Association", which consists of CHP developers as well as consultants and gas and electricity companies with interests in CHP development. The Task Force provides input, guidance and direction to the Midwest CHP Application Center.

Over the last year the Illinois Department of Commerce and Community Affairs (DCAA), the Illinois Environmental Protection Agency and the City of Chicago joint the U.S. EPA CHP Partnership Program, which commits these entities to actively promote BCHP technologies. As part of this commitment, DCAA, the City of Chicago, the U.S. EPA and the U.S. DOE Chicago Regional Office sponsored a one day workshop in July 2002 for Illinois businesses on Combined Heat and Power Applications.

On the regulatory side, the Governor signed Senate Bill 1565 into law (August 2, 2002), which creates an Energy Efficient Revolving Loan Fund. This Fund provides loans for energy efficient measures to local governments or non-profits engaged in load aggregation and may encourage certain CHP technologies. On a more negative note, a "hodge-podge" of interconnection standards and especially stand-by charges such as Commonwealth Edison's Rate 18 still impede market transformation towards CHP technology.

Over 50 technical companies are actively pursuing BCHP deployment and installations in Illinois. There are several large well-known engineering firms, as well as equipment manufactures and distributors who are aggressively pursuing the BCHP market in Illinois. Some of the most active firms in Illinois in the BCHP sector include LaSalle Associates, Stanley Consultants, Ballard Engineering, Nicor and Peoples Energy.

Focusing on BCHP systems in commercial installations the Midwest Application Center (MAC) identified a total of 31 BCHP systems, producing a little over 112,000 kW in Illinois. Schools/Universities/Research Centers constitute the biggest installed BCHP market segment in Illinois (73,935kW) followed by installations at Hospitals (26,340 kW).

Capital costs as well as operating costs remain some of the major hurdles to utilize BCHP technologies. The predominant technologies in BCHP power generation are fueled by natural gas. They range in size from reciprocating engines and microturbines in the tens of kilowatts to gas turbines in the tens of megawatts range. The least expensive technologies (large natural gas turbines) installed start around $600/kW and increase in cost up to fuel cell technologies that run around $5000/kW. Natural gas reciprocating engines are the predominate technology, and can range in price from $1,000 to $1,800/kW. Although prices of all of these technologies are expected to decrease as the technologies and system designs become more common. For smaller generating capacity units, this initial cost can have a long payback period unless electric costs are very high and thermal loads well matched.

For most BCHP systems natural gas constitutes the majority of the variable/operating cost. High natural gas prices, such as those experienced in the winter of 2000/2001, could have negative affects on the BCHP market development, but these high gas prices are not anticipated to reoccur. The EIA expects natural gas prices to be around $3 per MMBtu by 2020. The average price paid for natural gas by commercial customers in Illinois was $6.90 in 2000, which is above the national average of $6.59 per MMBtu.

In Illinois the average cost of electricity is relatively high for commercial customers at 7.53¢/kWh. This is above the national average of 7.36¢/kWh. This can be viewed as positive sign for BCHP since high prevailing electricity prices improve the economics for BCHP systems.

The most effective deployment of BCHP technology will come from regional and local activities. This is true because most of the barriers are due to local issues, such as site permitting, interconnection requirements and studies, local utility pricing, and local building codes and standards. These barriers can be overcome with support from regional and local entities. Some of the entities identified by the MAC that could assist with the development and/or deployment of a BCHP in Illinois are:

- Illinois Department of Commerce and Community Affairs
- City of Chicago, Department of the Environment
- The Midwest CHP Application Center
- The Midwest CHP Initiative
- The Midwest Cogeneration Association

ONSITE Energy Corporation in January 2000 prepared a study for the Energy Information Administration titled “The Market and Technical Potential for Combined Heat and Power in the Commercial/Institutional Sector.” For Illinois, ONSITE estimated a total market potential for electric production to be in the range of 2,400 to 7,500 MW.

This potential may only be realized if the regulatory and policy issues become more supportive of BCHP installations. Also if incentives are provided and use of thermal technologies is considered, additional market potential capacity could be realized.

Besides commercial and industrial applications BCHP systems also have potential market viability for multi-unit residences (those with 2 or more units). The MAC estimated that the potential Illinois market for BCHP installations in the multi-unit residential sector for 2001 to be about 24,000 units. Also, there is a large potential to add heat recovery for Data Centers/Office Buildings and Schools/ Universities/Research Centers, where there is already a large amount of installed generation capacity.

This report concludes with recommendations, which address the need to educate state regulators and private market participants on BCHP benefits. Case studies are needed which show the tremendous economic and environmental benefits of BCHP systems. In addition, the Midwest CHP Application Center, needs to further strengthen the alliances now being formed with already influential companies in the BCHP field, such as LaSalle Associates, Ballard Engineering, and Stanley Consulting. The solicitation of support from governmental agencies such as the City of Chicago and the Illinois Department of Commerce and Community Affairs needs to be continued. Finally, the Midwest CHP Application Center should partner with other associations within Illinois, such as the Midwest CHP Initiative, the Midwest Cogeneration Association, and the Electric Light and Power Consortium to educate and influence the Illinois Commerce Commission to reduce the regulatory barriers, such as rate structures and interconnection requirements, that impede the deployment of CHP in Illinois.

## 1. Introduction and Purpose

Information provided in this document represents an update in all major areas to the original "BCHP Baseline Analysis for the Illinois Market", which was completed in August 2001. Like the original Baseline Analysis the purpose of this document is to assess the current status of the BCHP sector in Illinois and identify current hurdles that prevent the widespread use of BCHP systems. This updated information will be used to identify target markets for BCHP systems as well as development of education and market transformation programs, which will foster BCHP applications. Finally, an action plan will be developed to further BCHP deployment in Illinois.

Cooling, Heating, and Power for Buildings (BCHP) refers to technologies which generate electricity at or near the point of use, such as a building or building complexes, while simultaneously recovering up to 80% of the waste heat for heating, cooling and/or dehumidification purposes.

In order to assess the current state of BCHP in Illinois, a comprehensive survey of key players involved with this technology was conducted. Key engineering firms, manufacturers, distributors, architectural firms, energy suppliers and federal, state and local agencies were identified. Furthermore a survey of existing and pending BCHP installations was conducted. Also identified in this survey were distributed generating installations that do not recover the waste heat; these installations represent relatively good candidate sites for conversion to BCHP systems because only heat recovery equipment needs to be provided and therefore the cost differential is minimal and easier to justify.

In this report, the initial cost of current BCHP related technologies, the impact of standby-charges applied to self-generation installation and financial incentives were evaluated to assess their impact on the marketability of BCHP.

A status assessment of policy related issues' pertaining to BCHP was conducted. The assessment was performed for five policy areas; access and interconnection rules, exit fees, general progress with state electric deregulation, emerging legislation, and potential partners/advocates of BCHP.

The market capacity potential for BCHP in Illinois was evaluated to identify the best target sectors for deployment.

This report concludes with recommendations to effectively promote the deployment of BCHP in Illinois.

## 2. BCHP Contacts in Illinois

### 2.1 Key Illinois Firms with BCHP Project Experience or Capabilities

One of the major methods to promote market acceptability of BCHP technologies is to engage the efforts of commercial firms that can foster the installation of BCHP technologies. Besides those that can benefit directly through profits and savings from BCHP, there are other firms, which have the interest and capability to get involved with BCHP applications either because they promote energy efficiency, green building technologies, or have other BCHP supporting missions. The purpose of this section is to identify those key firms that currently exist in that can be allied with the Midwest CHP Application Center to promote the deployment of BCHP in Illinois.

There are approximately 50 companies in Illinois that are engaged in BCHP system applications or have BCHP system capabilities. This indicates an overall moderate interest from the private market for the deployment of BCHP technologies. Hopefully in the near future interest in BCHP applications will increase even more through the activities of a multitude of local and regional organizations that are involved with the promotion of BCHP applications.

Architectural and Engineering firms are important to promoting BCHP technologies because the most economical time to install a BCHP system is during the construction of a new building or during an extensive renovation, when the central heating and cooling plant is being initially installed or completely replaced. This is because the payback period associated with the cost to install a BCHP system need only be justified on the cost differential between the BCHP system and a conventional central cooling/heating system which otherwise would have to be installed. Architectural and engineering firms are generally engaged in the design and installation of such facilities in commercial and light industrial applications. Appendix A provides information on architectural firms and engineering firms that are potential allies in the promotion of BCHP installation in Illinois. There are currently approximately 25 architectural and engineering firms that have developed and deployed BCHP systems in Illinois.

Manufacturers of power generation equipment, absorption chillers, and desiccant dehumidification equipment, and their sales representatives are important to promoting BCHP technologies for obvious reasons, to sell their equipment. In most cases these manufactures have established a market presence and have built relationships with those most likely to install BCHP technologies. Appendix B provides information on manufacturers that promote BCHP installations in Illinois. There are currently about 20 manufactures/sales offices involved in deployment of BCHP related technologies in Illinois.

Property management firms are important to promoting BCHP technologies because they are the operators of most commercial buildings in which BCHP technologies would be suitable and therefore are interested in reducing energy costs. They often are the decision makers as to what type of central service systems are installed. In many of the buildings that they operate, they are already required by newer building codes to provide some sort of emergency generation electric power generation equipment. Since they are already

required to install generation equipment, the cost differential to install BCHP over a conventional central heating/cooling system is again smaller and easier to justify. In addition, it provides them the ability to provide more reliable power to tenants, which is becoming an important issue to many business operators. The main organization which represent property management firms in Illinois is BOMA (Building Owners and Managers Association). Information on BOMA chapters in Illinois and Property Management firms can be found in Appendix C.

Local energy suppliers are also important to promoting BCHP. Many have formed subsidiary companies to promote distributed generation, especially the gas supply companies, however they are not necessarily considering BCHP because they often can justify cost based on the peak shaving savings of electrical generation even without heat recovery. In addition to traditional energy supply companies, energy services companies (ESCOs) are now beginning to become interested in BCHP technologies. In the past they have not been interested because it is easier for them to find other cost saving measures like lighting retrofits and energy control systems in commercial and light industrial applications, and in many cases regulations and siting requirements served as a disincentive for them to install BCHP. A list of energy supply and services companies in Illinois is provided in Appendix D.

## 2.2 Associations and Organizations Involved with BCHP Deployment

Federal, State, and regional governmental entities are becoming interested and concerned about distributed energy. With that comes potential opportunities for making BCHP systems an important part of the generation mix. Governmental entities are increasing their interest in BCHP because of the energy savings and reduced emissions it provides. Many are promoting its development by offering grants or low or no cost loans.

While the Federal government, through the Department of Energy, Office of Distributed Energy and Electric Reliability (ODER), has provided substantial support, the most effective deployment of BCHP technology will come from regional and local activities. This is true because most of the barriers are due to local issues, such as site permitting, interconnection requirements and studies, local utility pricing, and local building codes and standards. These barriers can be overcome with support from regional and local entities.

The Midwest is home to many non-profit organizations and associations that have come forward to support the deployment of BCHP, in fact the Midwest appears to be leading the way in promoting the deployment of BCHP. Within the state of Illinois and the Midwest, the Midwest CHP Initiative has the potential to be a strong ally in the deployment of BCHP. The Midwest CHP Initiative is an interest group, which includes the regional offices of the EPA and DOE, local energy services companies such as Nicor and Peoples Energy, research organizations such as the Gastechnology Institute and the University of Illinois at Chicago Energy Resources Center and finally state regulators from the various Midwestern states. A list of these associations and organizations and their web-addresses, where available, is provided in Appendix E.

## 3. Survey of BCHP Installations and BCHP Targets in Illinois

### 3.1 Survey Summary

This survey was conducted to identify existing and pending BCHP installations in order to assess the current statutes of BCHP in Illinois; to establish a baseline and to identify those facility types were BCHP was most prevalent. Also identified in this survey were distributed generating installations that do not recover the waste heat. For the purposes of this survey, they represent relatively easy candidate sites for conversion to BCHP because they already have the generation source; they only have to justify the differential cost to install heat recovery equipment.

The survey of BCHP installations and potential BCHP targets was primarily based on personal interviews as well as the use of published data including websites and promotional materials. Published data also consisted of the Energy Information Administration's "Inventory of Nonutility Electric Power Plants in the United States"(http://tonto.eia.doe.gov/FTPROOT/electricity/0095992.pdf), dated November 2000. Sites that are greater than 1 MW were easier to identify because they must file sitting reports with the Environmental Protection Agency (EPA). However sites less than 1 MW may or may not have a to file with the EPA. The sites identified represented the best efforts of the Midwest CHP Application Center to identify actual and potential BCHP installations in Illinois at the time of this report. Other existing or potential BCHP sites may exist; they will be added to the database and will be available over the website in the future as they are identified.

A total of 58 distributed facilities in the commercial sector in Illinois were identified with an installed capacity of over 194,000 MW of which 31 BCHP systems utilized the waste heat with an installed capacity of 112,000 MW. Appendix F categorizes and lists the known distributed generation installations based on the facility type in which the system is installed and provides the size of the installed generation capacity. Where it was known, thermal heat recovery was noted, or if the system is installed for peak shaving or back-up purposes power only. The table also lists whether the facility is in operation or pending. Where additional information was available about the installation configuration, it is appended to the table corresponding to the index numbers in the right hand column of the table.

This report focuses primarily on BCHP applications for buildings. However, for the purpose of providing a comprehensive overview, a similar summary table on industrial applications is attached to this report in Appendix G. Industrial applications also provide opportunities for CHP because they may already use the waste heat for industrial processes, but may have additional potential to use the waste heat to operate thermally activated technologies for cooling or dehumidification of their building facilities.

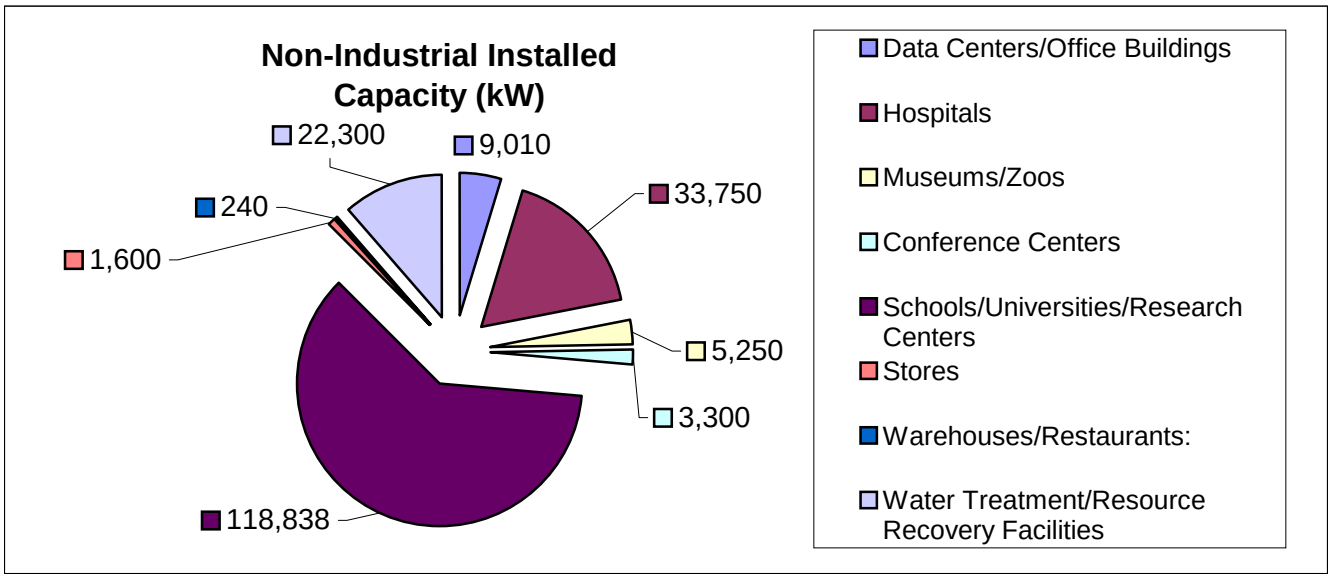
### 3.2 Sector Analysis of the Survey Data

The sites identified during the survey represent the best efforts of the Midwest CHP Application Center to identify actual and potential BCHP installations in Illinois. Other

candidate BCHP sites may exist. An analysis of the survey information for the commercial and light industrial sectors is provided in Table 3-1 and Figure 3-1 below.

**Table 3-1 BCHP Capacity Installed by Sector in Illinois**

| | Installed Capacity (kW) | Installed Capacity (%) | Capacity w/ Waste Heat Recovery (kW) | Capacity w/ Waste Heat Recovery (%) |
|---|---|---|---|---|
| Data Centers/Office Buildings | 9,010 | 4.6 | 1,200 | 1.1 |
| Hospitals | 33,750 | 17.4 | 26,340 | 23.5 |
| Museums/Zoos | 5,250 | 2.7 | 5,250 | 4.7 |
| Conference Centers | 3,300 | 1.7 | 3,300 | 2.9 |
| Schools/Universities/Research Centers | 118,838 | 61.2 | 73,935 | 65.9 |
| Stores | 1,600 | 0.8 | 0 | 0.0 |
| Warehouses/Restaurants: | 240 | 0.1 | 0 | 0.0 |
| Water Treatment/Resource Recovery Facilities | 22,300 | 11.5 | 2,100 | 1.9 |
| Total: | 194,288 | | 112,125 | |



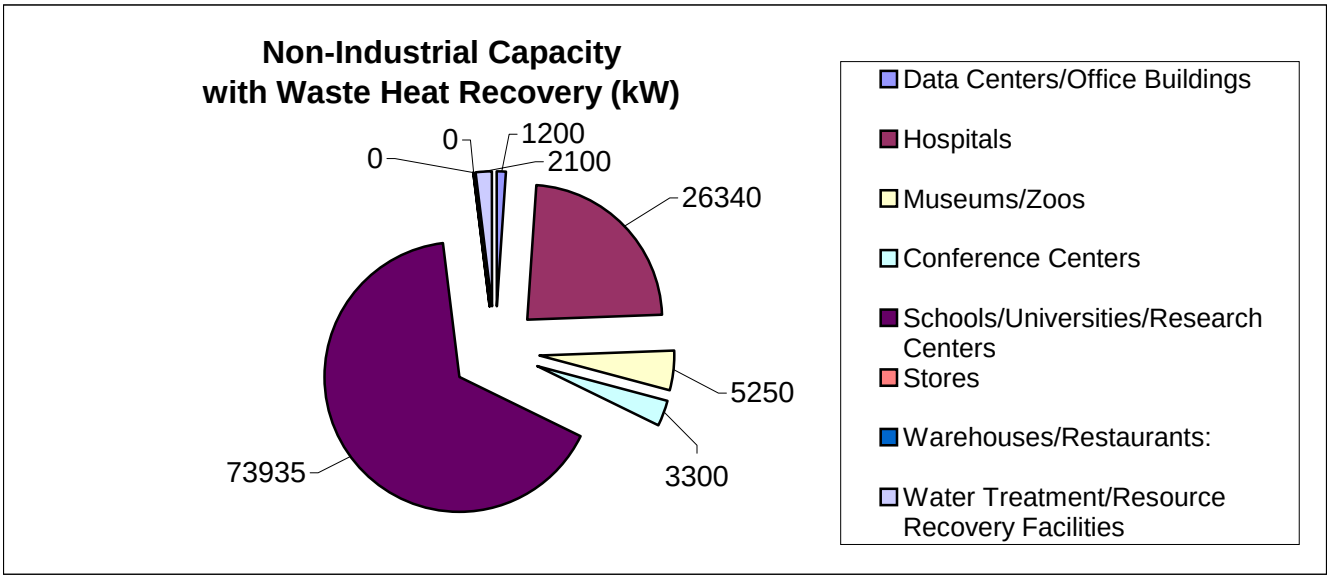



**Figure 3-1 BCHP Capacity Installed by Sector in Illinois**

As can be seen Schools/Universities/Research Centers constitute the biggest installed BCHP market segment in Illinois followed by Hospitals. There is a large potential to add heat recovery for Data Centers/Office Buildings and Schools/Universities/Research Centers, where there is already a large amount of installed capacity.

## 4. Current Pricing Issues

Capital costs as well as operating costs are generally viewed as some of the major hurdles to utilize BCHP technologies. This section will address these issues.

### 4.1 Equipment and Maintenance Costs

The predominant prime mover technologies in BCHP applications are reciprocating engines, combustion turbines, and microturbines. In the near future fuel cell technology is expected to become a prevalent BCHP technology as well. Absorption chillers convert the waste heat stream from prime movers into cooling.

Each technology operates at different efficiency and capacity size levels. The following table compiled by the Midwest Combined Heat and Power Application Center indicates the cost and other relevant technical data for the various equipment types.

**Table 4-1 CHP Technologies**

| | Gas Engine | | Gas Turbine - Simple Cycle | | Micoturbines | Fuel Cells |
|---|---|---|---|---|---|---|
| **Size Range (kWe)** | **100 - 500** | **500 - 2,000** | **1,000 - 10,000** | **10,000 - 50,000** | **100 - 500** | **30 - 3,000** |
| **Efficiency (LHV)** | | | | | | |
| **Btu/kWh** | **12,000 - 14,000** | **10,000 - 12,000** | **12,000 - 14,000** | **9,500 - 11,000** | | |
| **%** | **24 - 28** | **28 - 34** | **24 - 28** | **31 - 36** | **14 - 40** | **40 - 57** |
| **Installed Cost ($/kWe)*** *(with Heat Recovery)* | **$1,400 - $1,800** | **$1,000 -$1,500** | **$1,000 - $1,500** | **$600 - $1,000** | **$1,000 - $1,500** | **$2,000 - $5,000** |
| **O & M Costs ($/kWh)** | **$0.012 - $0.015** | **$0.010 - $0.012** | **$0.003 - $0.006** | **$0.003 - $0.006** | **$0.005 - $0.010** | **$0.002 - $0.05** |
| **Recoverable Heat** | | | | | | |
| **Steam (lb/h/kWe)** | **4 - 5** ***(15 - 30 psi)*** | **4 - 5** ***(15 - 30 psi)*** | **5 - 6** ***(300 - 600 psi)*** | **5 - 6** ***(300 - 600 psi)*** | | |
| **Hot Water (Btu/kWe/h)** | **4,000 - 4,500** | **4,000 - 4,500** | **4,500 - 5,00** | **4,500 - 5,00** | | |
| **Absorption Cooling** | | | | | | |
| **Single ($/RT)** | **$500 - $1,000** | **$250 - $500** | **$200 - $250** | **$200 - $250** | | |
| **Double ($/RT)** | **N/A** | **N/A** | **$400 - $500** | **$350 - $400** | | |
| **RT/kWe** | **0.22 - 0.28** | **0.22 - 0.28** | **0.28 - 0.33** | **0.28 - 0.33** | | |
| **Electric Chillers ($/RT)** | **$200 - $300** | **$200 - $300** | **$180 - $250** | **$180 - $250** | | |

** Costs can vary significantly due to interconnection and other siteing requirements.*

## 4.2 Electric Pricing

The EIA's State Energy Price and Expenditure Report (1999) provides a composite table of the historical energy prices in Illinois by sector and fuel type (www.eia.doe.gov/pub/state.prices/pdf/MI.pdf). The EIA website also has a page that provides extensive information on energy data in Illinois (www.eia.doe.gov/emeu/states/main_il.html).

In the annual Energy Information Administration report titled "Annual Energy Outlook 2002 with Projections to 2020" (www.eia.doe.gov/oiaf/aeo/pdf/0383(2002).pdf), the EIA projects that the average electricity prices will decline from 6.9 cents per kilowatt-hour in 2000 to 6.5 cents per kilowatt-hour in 2020. Electricity industry restructuring contributes to declining projected prices through reductions in operating and maintenance costs, administrative costs, and other costs. Electricity prices are projected to decline to 6.3 cents per kilowatt-hour by 2006 then rise in the last 5 years of the forecast as natural gas prices rise.

In Illinois the average price of electricity to commercial customers was 7.53 cents/kWh (year 2000), which is above the U.S. average of 7.36 cents/kWh. The average price of natural gas in 2000 as sold to commercial customers was $6.9/MMBtu, which is also above the national average of $6.59/MMBtu.

There are five major electricity suppliers in Illinois are shown below in Table 4-2. In addition to investor owned utilities, Illinois has 41 publicly owned power systems and 27 electric cooperatives.

**Table 4-2 Five Largest Utilities by Retail Sales within the State, 1999 (Megawatthours)**

| Utility | All Sectors | Residential | Commercial | Industrial | Other |
|---|---|---|---|---|---|
| Commonwealth Edison Company | 83,500,597 | 23,715,724 | 29,124,844 | 22,473,975 | 8,186,054 |
| Illinois Power Company | 18,215,452 | 4,948,645 | 4,173,251 | 8,721,860 | 371,696 |
| Central Illinois Public Service Co. | 8,538,572 | 2,990,412 | 2,735,722 | 2,647,412 | 165,026 |
| Central Illinois Light Company | 5,910,714 | 1,772,224 | 1,684,617 | 2,425,321 | 28,552 |
| Union Electric Co. | 3,621,194 | 600,520 | 709,626 | 2,295,019 | 16,029 |
| **Total** | **119,786,529** | **34,027,525** | **38,428,060** | **38,563,587** | **8,767,357** |
| Percentage of Utility Sales | 91 | 86 | 92 | 93 | 96 |

***Source**: EIA Website State Electricity Profiles – Illinois (http://www.eia.doe.gov/cneaf/electricity/st_profiles/illinois/il.html)*

## 5. Summary and Status of BCHP Policy Issues

The purpose of this section is to provide a summary and status of policy related issues pertaining to the advancement of Cooling Heating and Power (CHP) for Buildings in the State of Illinois. The following policy areas are summarized: Access and Interconnection Rules, Rates, Standby Charges and Exit Fees, General Progress with State Electric Deregulation, Emerging Legislation, and Potential Partners / Advocates of CHP.

### 5.1 Access and Interconnection Rules

In Illinois there is no State standard for exit, interconnection or stand-by fees and no regulatory or legislative policy regarding distributed energy. Currently, it is left up to each individual electric utility to define the procedures that affect DE installations. Each utility's approved rate structure and its own guidelines must be followed when installing DE within that electric utility's service territory.

This "hodge-podge" of rules, standards, and fees makes it difficult for companies that want to install DE at numerous sites over several electric utility territories within the State. The economics for a DE installation in one service territory will likely be very different than in another.

Recently, however, the Illinois Commerce Commission Staff has begun working on a project to identify appropriate interconnection standards for distributed generation connected to utility distribution facilities. This is currently an informal Staff activity without any associated Commission docket, and accordingly no information is available on the web site. As of this time industry participation in this activity has not been solicited. Phillip Roy Buxton, Manager of Engineering, Energy Division, Illinois Commerce Commission is leading this effort for the ICC.

The largest electric utility in Illinois is ComEd. Their "Blue Book" or "Guidelines for Operation of Non-Utility Generation in Parallel with the ComEd System," provides detailed technical guidance on the requirements for interconnection. In addition to the standby costs addressed below, there is the cost of commissioning an interconnection study to ascertain the impact of the proposed DE installation on the electric grid. This study will determine the interconnection requirements for the installation. These studies can cost between $3000 and $250,000. The potential end user is required to pay ComEd for the study. Studies are required for all DE installations over 40 kilowatts.

### 5.2 Rates

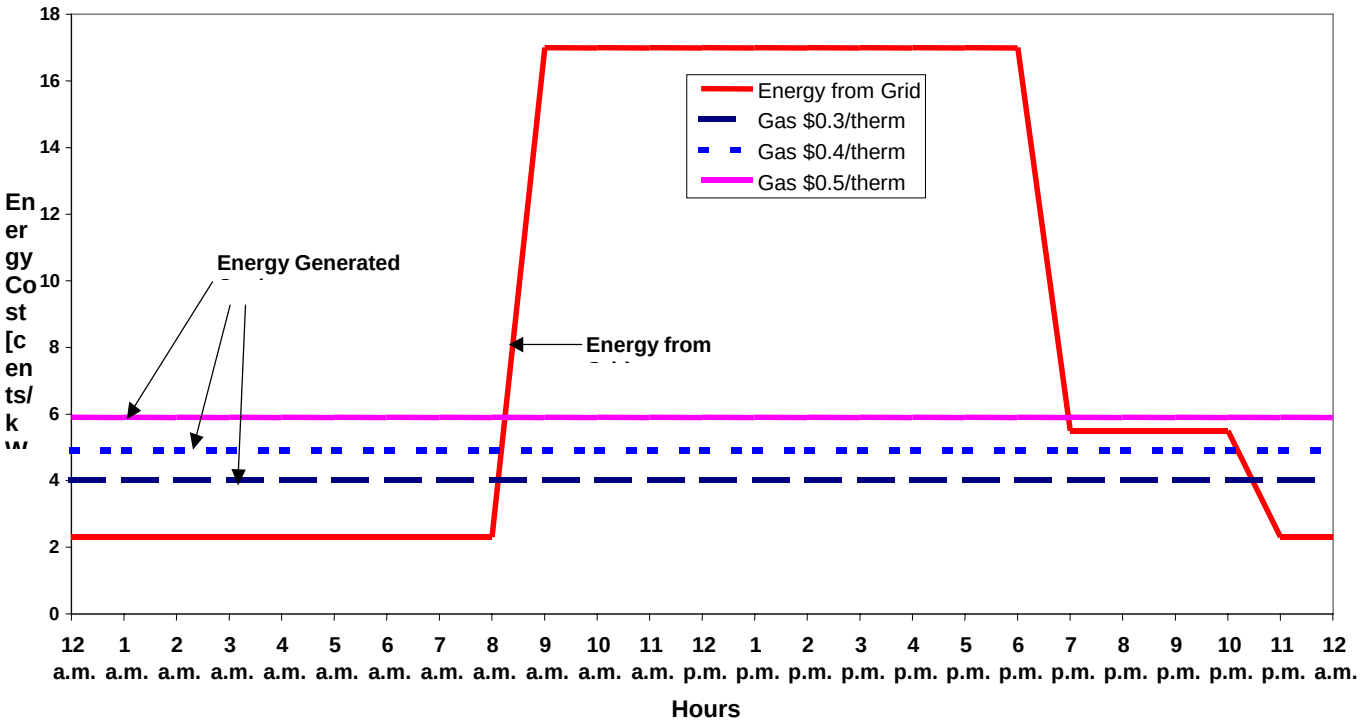
Commonwealth Edison's Rate 18 is the rate that most affects the installation and operation of DE generation, including detailed and complicated standby charges. In the past these standby charges have been known to be the sole stopper of some DE projects in ComEd's territory. A synopsis of Rate 18 (Attachment D) is attached to this document. The complexity of this rate underscores one of the major barriers in determining the actual economics of the installation and operation of DE.

Customers often pay outside consultants to decipher jargon, penalties, access, study-fees and many other rate related matters. This complexity can create uncertainty for

customers who need hard answers about the economics of a DE installation, and underscores one of the major hurdles in determining the actual economics of the installation and operation of DE.

Below is a table outlining the effect of ComEd commercial rates on the economics of a 1,000 kW BCHP installation at various configurations at $5/mmBTU gas costs. As shown in the Figure below ComEd commercial rates are designed to reflect the high cost of peak daytime electricity. This Figure and the Table below show that under this rate structure BCHP is most economical during the day (9am to 10pm) with savings up to $200,000 a year for a 1,000kW BCHP system. Conversely, BCHP is uneconomical at night when electricity prices approach 2 cents/kWh. Of particular note in the Figure below is that ComEd's energy charge is approximately 5.5 cents/ kWh from 9 am to 6 pm while the demand charge equates to 11.5 cents/ kWh for that period. The demand charge can be as high as approximately 90 cents/ kW for peak demand loads that last only 1 hour.

## Electric Energy Cost - Chicago Rate 6L/18




| | | Baseline Com Ed Rate 6L | 1000 kW DG Only 9am - 10pm | 1000 kW 50% of Recoverable Heat Used BCHP 9am to 10pm | 1000 kW 100% of Recoverable Heat Used BCHP 9am to 10pm | 1000 kW DG Only 24 hours | 1000 kW 50% of Recoverable Heat Used BCHP 24 hours |
|---|---|---|---|---|---|---|---|
| Energy Cost | | 1,180,143 | 1,045,524 | 1,011,237 | 976,950 | 1,155,361 | 1,097,102 |
| Rate 18 Customer Charge | | | 1,290 | 1,290 | 1,290 | 1,290 | 1,290 |
| Energy Cost Savings | | | 133,329 | 167,616 | 201,903 | 23,492 | 81,751 |
| | | | Additional Cost Resulting from Generator Failure | | | | |
| Rate 18 Facilities Charge | | | 39,360 | 39,360 | 39,360 | 39,360 | 39,360 |
| **Generator Offline for 1 Day**. Additional Energy and Demand Cost Affecting Energy Cost Savings Corrected for Generator Fuel and O&M Cost Reduction | A | | 223 | 370 | 516 | 51 | 305 |
| **Generator Offline for 5 Days**. Additional Energy and Demand Cost Affecting Energy Cost SavingsCorrected for Generator Fuel and O&M Cost Reduction | B | | 1,116 | 1,849 | 2,581 | 256 | 1,526 |
| **Generator Offline for 31 Days.** Additional Energy and Demand Cost Affecting Energy Cost Savings Corrected for Generator Fuel and O&M Cost Reduction | C | | 5,134 | 8,503 | 11,873 | 1,180 | 7,022 |

Additional costs of Rate 18 based on 1000 kW max. and 700 kW average extra power provided by the utility during generator failures. Assumes generator fails during the peak demand hours of month of August with Rate 18 supplemental service level of 1,786 kW and demand peak period load factor for supplemental service varying from 0.044 for 1 day failure to 0.217 for 5 day failure and 0.999 for full month failure.

Baseline application has total annual electric consumption of 12,000,( and max. demand of 2,840 kW. Cooling provided by one 500 RT abs chiller and two electric centrifugal machines providing total cooling ca 1,600 RT. Analyzed BCHP configuration assumes 1000 kW gas engi generator with heat recovery to heating/absorption equipment. Natur $0.5/therm

## 5.3 Standby Charges

The Table above estimates the economic impact of possible failure of the system. Most building owners request consideration of this cost as a contingency factor when considering BCHP system economics. The standby charges include an annual customer charge $1,290. In the event of a failure that exceeds 30 minutes the user is assessed a standby charge of approximately $40,000 per 1000kW of demand. This standby charge would be in effect for a 12 month period. The customer would also pay additional energy charges which are shown above as the costs paid to the utility above what was allocated to run the BCHP system.

As you can see from the above, the standby charge alone can significantly reduce the cost savings of a given configuration. In addition, dependent on the assumptions made in the financial analysis concerning failures, variable charges can almost double the fixed charge. It should also be noted that these rates do not have provisions to account for the benefit DG can provide to the grid.

## 5.4 Exit Fees

Exit fees are determined by ComEd on a case by case basis and can vary significantly. However exit fees are not allowed if customers exit the utility system to generate electric power for their own use, i.e. "within the fence."

## 5.5 General Status of Progress on Deregulation

The Illinois Electric Service Customer Choice and Rate Relief Law of 1997 restructured the state's electric utility industry to offer customers choices about who supplies their electric power, competitive prices for that power, and new services. Non-residential supplier choice was phased in from 1998 through 2000. With regard to deregulation and DE, the ICC has taken the following actions:

- Sent out DE Questionnaire in Spring of 1999 (see below)
- Hearing on California energy situation in Spring of 2001
    - The ICC did hold a hearing on the California energy crisis; general consensus was that something similar would not happen in Illinois.
- Initial plans to establish an Interconnection working group have been put on hold, with activity here limited to the ICC's Engineering group (see above).
- Illinois appears to be taking a wait and see approach and is falling behind other States when developing statewide rules for DE

The Illinois Commerce Commission (ICC) began to address the issue of DE by sending out a detailed list of questions (Exhibit A) in the Spring of 1999 and receiving comments back from a variety of interested companies and organizations. Companies that answered the questionnaire and/or provided additional comments include:

- NICOR
- Ameren CIPS

- Caterpillar
- Corn Products
- Cummins ONAN Northern
- Edison Electric Institute
- Enron, Environmental Law and Policy Center
- Illinois Power Mid American
- New Energy
- Peoples Energy
- Unicom

A diversity of opinions and suggestions were offered by the entities responding to the questionnaire. In general, the electric utilities stated that the existing regulatory situation works well for the market and little or no changes need to occur. Most of the others offered a variety of changes and suggestions.

As of this date, the ICC has not outlined any concrete initiatives or regulatory changes to reduce barriers for DE installations. While it has issued a report regarding the responses it received, no plan is being offered at this time. The ICC staff has informally begun to investigate the idea of an interconnection standard for the State but no hearings have yet been scheduled.

### 5.6 Recent Legislation

**SB 1565** was signed into law on August 2, 2002 by the Governor. This law creates the Energy Efficient Revolving Loan Fund, which provides low interest loans to local governments and non-profit organizations for certain energy efficient measures. Eligible energy efficient measures include bulk purchase of high-efficiency energy equipment or appliances, energy monitoring devices, or clean small-scale energy production devices. This means that certain CHP technologies and installations may be able to benefit from this Fund. However, the Fund is only available to non-profits and local governments engaged in loan aggregation and not single end-users.

**The Illinois Resource development and Energy Security Act** was signed by the Governor on June 22, 2001. The main purpose of the act is to provide an attractive environment for companies wanting to build large electric producing power plants 400 megawatts or larger.

The legislation provides incentives, most of which are focused on companies willing to build power plants that would burn Illinois Coal. It also contains favorable wording regarding renewable energy with goals in line with the Repower the Midwest Report developed by the Environmental Law and Policy Center, however its does not appear there is an enforcement mechanism.

The purpose of the Act is as follows “to enhance the State’s energy security by ensuring that: (i) the State’s vast and underutilized coal resources are tapped as a fuel source for new electric plants; (ii) the electric transmission system within the State is upgraded to

more efficiently distribute additional amounts of electricity; (iii) well-paying jobs are created as new electric plants are built in regions of the State with relatively high unemployment; and (iv) pilot projects are undertaken to explore the capacity of new, often renewable sources of energy to contribute to the State's energy security.

## 5.7 U.S. EPA CHP Partnership

The EPA CHP Partnership is a voluntary program designed to foster cost-effective CHP projects. Through the program EPA engages the CHP industry, state and local governments, and other stakeholders in cooperative relationships to expand the use of CHP. As part of the partnership program, state and local governments agree to host a CHP workshop and review EPA documents detailing state and local regulations that may affect CHP development. Industrial partners agree to work with EPA to evaluate the use of additional CHP at their facilities.

State and government partners in Illinois include the Department of Commerce and Community Affairs (DCAA), the Illinois Environmental Protection Agency, and the City of Chicago. As part of their commitment, DCAA, the City of Chicago, the U.S. EPA and the U.S. DOE Chicago Regional Office sponsored a one-day workshop in July 2002 for Illinois businesses on Combined Heat and Power Applications.

Industrial partners in Illinois include Abbott Laboratories, Archer Daniels Midland Company, Caterpillar Inc., and Peoples Energy Corporation.

## 5.8 Potential Political Partners or Advocates of CHP

When investigating possible partners or advocates within the State one must remember that there is an education process that needs to be developed. Most, but not all of the potential partners or advocates are not yet educated on the benefits of CHP. An initiative designed to improve the market environment for CHP could be educatory, regulatory or legislative, or a combination of all three.

Below are a list of groups that could assist with the development and/or deployment of CHP technology.

- Energy & Environment Committee members in both Illinois House and Senate
- Governor's Energy Cabinet Members
- Clean Energy Community Trust Fund Board Members
- Metropolitan Mayor's Caucus

Obviously, the Illinois Governor, the Mayor of Chicago or the leadership in the Illinois House or Senate could also help, however, they are likely to be more difficult to reach and/or influence. Members of their staff's may be better targets with any CHP initiative. The groups listed above are not to be viewed as all-inclusive, as there are other groups

and or organizations to be targeted. Those listed above, however, should make for a good starting point.

In addition, the 13 companies and organizations that responded to ICC DER questionnaire with a positive favor for CHP can be considered advocates. Some of these companies include Caterpillar, Cummins, Nicor and Peoples Energy.

## 6. The Market Capacity Potential of BCHP in Illinois

The previous sections identified the key parties currently involved with BCHP technology and detailed some of the areas preventing market transformation. However, market transformation in favor of BCHP technologies is only viable if the market potential exists. Therefore in the following discusses the market potential for each BCHP category, industrial, commercial and multi-unit residential.

Estimates for the Industrial/Commercial Sector were derived from a previous study conducted by ONSITE-SYCOM Energy Corporation (ONSITE). Estimates for the Multi-family Residential Sector are based on Midwest CHP Application Center research.

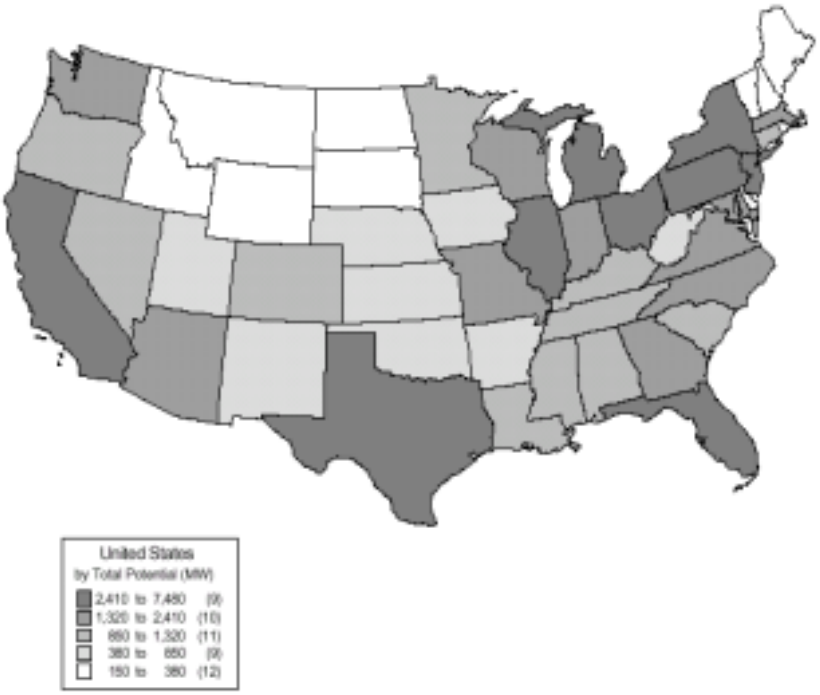
### 6.1 Industrial and Commercial Market

ONSITE Energy Corporation in January 2000 prepared a study for the Energy Information Administration titled "The Market and Technical Potential for Combined Heat and Power in the Commercial/Institutional Sector." This study identified potential BCHP application sites using the iMarket, Inc. MarketPlace Database to select commercial/industrial building types based on SIC codes.

The potential buildings were: hotels/motels, nursing homes, hospitals, schools, colleges, commercial laundries, car washes, health clubs, golf clubs, museums, correctional facilities, water treatment plants, extended service restaurants, supermarkets and refrigerated warehouses. The buildings were divided into different groups based on their electric demand. The electric demand was estimated using data from Wharton Economic Forecasting. As a result ONSITE selected 1,431,805 buildings in the United States as suitable for BCHP applications requiring a capacity of 77,281 MW.

There study focused on applications where thermal energy load was in the form of steam or hot water usage. It did not take into consideration the use of thermal activated technologies such as absorption chillers or desiccant dehumidifiers as potential candidates for thermal load. Taking into consideration these technologies will likely increase the market potential from their estimates.

On a state-by-state basis, ONSITE estimated the following potential:




For Illinois, ONSITE estimated a total market potential for electric production to be in the range of 2,400 to 7,500 MW. This represents 5 to 16% of the projected DOE long-term goal of 47 gigawatts of installed BCHP capacity that was developed as part of the BCHP Roadmap Workshop. This potential may only be realized if the regulatory and policy issues become more supportive of BCHP installations. Also if incentives are provided, additional market potential capacity could be realized.

## 6.2 Multi-Family Residential Market

Besides commercial and industrial applications BCHP systems also have potential market viability for multi-unit residences (those with 2 or more units). Compared to conventional HVAC systems, the installation of BCHP systems are particularly competitive when it comes to new construction or complete replacement of old HVAC systems.

Since all new and replacement HVAC systems need to be permitted in Illinois, permitting data provides a good estimate of buildings where BCHP systems may be a potential alternative. Applying the following assumptions the potential market for BCHP applications for multi-unit residences can be estimated:

- New construction remains at or near the same level as in the year 2001 (16,243 units),
- HVAC systems need to be replaced every 20 years, therefore units installed in 1981 would need to be replaced in the year 2001, and
- The number of HVAC units replaced in 2001 is consistent with the number of units installed in 1981 (7,942 units).

Applying these assumptions the new building permit data was obtained for 1981 and 2001, those with less than 2 units were not considered. Therefore the market potential for

multi-unit residential BCHP installation in Illinois for 2001 is estimated to be about 24,000 units.

# 7. Conclusions and Recommendations

## 7.1 Conclusions

### 7.1.1 Interest Level

In Illinois there appears to be an increasing interest in BCHP, where over 50 technical companies are actively pursuing BCHP deployment and installation in the State. There are several large well-known engineering firms, as well as equipment manufactures and distributors who are aggressively pursuing the BCHP market in Illinois.

The Midwest is home to many non-profit organizations and associations that have come forward to support the deployment of BCHP, in fact the Midwest appears to be leading the way in promoting the deployment of BCHP with such organizations as the Midwest CHP Initiative.

### 7.1.2 Installation Status

There is a decent amount of BCHP in Illinois; the Midwest Application Center (MAC) identified a total of 31 BCHP systems, producing a little over 112,000 kW in Illinois. Schools/Universities/Research Centers constitute the biggest installed BCHP market segment in Illinois (73,935kW) followed by installations at Hospitals (26,340 kW).

### 7.1.3 Barriers

***Interconnection*** poses to be one of the biggest barriers to BCHP in Illinois because there is no State standard for the interconnection process and related fees. However, the Illinois Commerce Commission Staff has begun work to identify appropriate interconnection standards for distributed generation.

***Capital costs and payback time frames*** are of concern. The least expensive electric generating technologies (large natural gas turbines) installed start around $600/kW and increase up in cost to fuel cell technologies that run around $5,000/kW. Additional costs, associated with thermal recovery equipment and engineering costs further add to the cost of the project. Prices are expected to decrease as the technologies and system designs become more common. For smaller generating capacity units, this initial cost can have a long payback period unless electric costs are very high and thermal loads well matched.

***Operating costs*** due to fluctuating gas prices as seen in the winter of 2000/2001 may be perceived as a concern, even though prices have returned to previous levels. The EIA expects natural gas prices to be around $3 per MMBTU by 2020. The average price paid for natural gas by commercial customers in Illinois was $6.90 (Year 2000), which is above the national average.

***Standby charges*** **and** ***electricity rates*** are also a factor in BCHP because they affect the payback period. Commonwealth Edison's Rate 18, for example, has the potential to greatly diminish the economics of a CHP installation.

### 7.1.4 Favorable Characteristics

***Deregulation*** and retail access is in advanced stages in Illinois, where to date all non-residential customers can choose their electricity provider.

***Favorable alliances*** exist in Illinois. The Midwest appears to be leading the way in promoting the deployment of BCHP with the Midwest CHP Initiative and the Midwest Cogeneration Association. Furthermore, the City of Chicago and the Illinois Department of Commerce and Community Affairs are EPA CHP partners, which fosters a favorable climate for CHP in the State.

***Market potential*** appears to be reasonable for BCHP. ONSITE Energy Corporation estimates for Illinois a total market potential of between 2,400 to 7,500 MW. Besides commercial and industrial estimates by ONSITE the MAC estimated the Illinois market for BCHP installations in the multi-unit residential sector to be about 24,000 units. Illinois has an installed distributed generation capacity of 194 MW in the commercial/ institutional sector, of which 112 MW are BCHP applications. The difference of approximately 72 MW could be easily converted to BCHP technology and constitute immediate market potential.

***High prevailing electricity prices*** in Illinois result in favorable economics for BCHP applications vis a vis traditional power supply form the incumbent utility.

## 7.2 Recommendations

1) Increase Interest and Market Penetration

   Develop a higher level of interest in BCHP by providing information and education to Architects, Engineers, Property Management Firms on the

   - technical and financial benefits of BCHP,
   - siting and permitting process,
   - successful BCHP installations (Case Studies), and
   - technical and financial assessments tools and resources available.

2) Influence the Removal of Regulatory Barriers

   Work with the Illinois Public Service Commission and educate State Regulators on the

   - Energy, environmental, and financial benefits of BCHP.
   - Need to address uniform interconnection standards and fees, and stand-by charges.
   - Need to consider appropriate incentives for BCHP such as tax incentives and subsidies such as is being done in with renewable energy technologies.

3) Build Alliances

   Build alliances with potential partners such as:

- Midwest CHP Initiative
- Midwest Cogeneration Association Joint Task Force
- Illinois DCCA and City of Chicago

## Appendix A: Architect and Engineering Firms Promoting BCHP Technologies in Michigan

American Institute of Architects, Illinois Chapters

AIA Eastern Illinois
PO Box 663
Orland Park , IL 60462
Phone: 312-946-7148

AIA Southern Illinois
c/o image Architects, Inc.
1118 W. Main St.
PO Box 850
Carbondale , IL 62901
Phone: 618-457-2128
Fax: 618-549-5725

AIA Northern Illinois
713 East State Street
Rockford , IL 61104
Phone: 815-962-3446

AIA Chicago
222 Merchandise Mart #1049
Chicago , IL 60654
Phone: 312-670-7770
Fax: 312-670-2422
sinkevitcha@aiachicago.org

AIA Northeast Illinois
412 Green Valley Drive
Naperville , IL 60540
Phone: 630-527-8550
Fax: 630-357-4818
aia_nei@earthlink.net

AIA Illinois
1 Old State Capitol Plaza N
Suite 300
Springfield , IL 62701-1323
Phone: 217-522-2309
Fax: 217-522-5370
AIAIllinois@ameritech.net

AIA Central Illinois

1 Old State Capitol Plaza N
Suite 300
Springfield , IL 62701-1323
Phone: 217-522-2309
Fax: 217-522-5370
AIACentralIl@ameritech.net

Architectural Firms:

Sonoc Architects
735 W. Division Street
Chicago, IL 60610
Contact: Scott Sonoc
Capabilities: Green Building, CHP Capabilities

Farr Associates Architecture and Urban Design, Inc.
53 West Jackson #1661
Chicago, IL 60604-3798
Phone: (312) 408-1661
http://www.farrside.com
Contact: Patrick Thornton
Capabilities: Green Building, CHP Capabilities

O'Donnell Wicklund Pigozzi & Peterson Architects, Inc.
111 West Washington #2100
Chicago, IL 60602-2783
Phone: (312) 332-9600
Fax: (312) 332-9601
E-mail: prosenzweig@owpp.com
http://www.owpp.com
Contact: Michelle Halle Stern
Capabilities: Green Building, CHP Projects Developed

Prisco Serena Sturm Architects
3351 Commercial Ave.
Northbrook, IL 60062-1908
Phone: (847) 564-0370
Fax: (847) 205-5089
Contact: Pat Dolan (will send info) 847 564 0370 x24
Capabilities: Green Building, CHP Projects Developed

Skidmore Owings & Merrill LLP
224 South Michigan Ave. #1000
Chicago, IL 60604-2505
Phone: (312) 554-9090

Contact: Kelly Andereck
Capabilities: Green Building

Engineering/Consulting Firms:

Avalon Consulting
Contact: Dharam Punwani
Phone: (630) 983-0883
Capabilities: Energy/CHP Consulting

Ballard Engineering
3555 Electric Avenue
Rockford, IL 61109
(815) 229-1800
Capabilities: CHP Turnkey Systems

Energy Choices, Inc.
1954 First Street
Suite 106
Highland Park, IL 60035
(847) 831-1151
Capabilities: Energy markets/fuel supply consulting

Excelon Services, Inc.
2315 Enterprise Drive
Westchester, IL 60154
708-236-8000

Flash Power
1224 W. Van Buren
Chicago, IL 60607
Contact: Dennis Flaum (773) 325-1000
Capabilities: CHP Turnkey Installations

GKC-EME
205 W. Wacker Drive
Chicago, IL 60606
Capabilities: CHP Turnkey Installations

IBC Engineering
Contact: Eric T. Truelove, P.E.
Branch Manager - Madison
IBC Engineering Services, Inc.
7402 Whitacre Road

Madison WI 53717
608-347-4738
Capabilities: CHP Turnkey Installations

KJWW Engineering Consultants
623 - 26th Avenue
Rock Island, IL 61201
Capabilities: HVAC, electrical, plumbing, fire protection, technology, and structural engineering

La Salle Associates
3700 North Southport
Chicago, IL 60613
Capabilities: CHP Turnkey Installations

Montgomery Watson Harza
175 West Jackson Blvd
Chicago, IL 60604-2814
Contact: Stephen J. Chippas, P.E.
(312) 831-3999
Capabilities: CHP Turnkey Installations

NICOR
Clyde K. Schafer, P.E.
Manager Technical Sales
1844 Ferry Road
Naperville, IL 60563-9600
630-983-8676, ext. 2806
Capabilities: CHP Turnkey Installations

OptimalPath
1224 West Van Buren Street
Chicago, IL 60607
Contact: Donna Urbikas
(312) 563-6106
Capabilities: Data Centers

Primera Engineering
25 E. Washington St.
Suite 510
Chicago, IL 60602
Contact: Ken Panunci
(312) 606-0629
Capabilities: HVAC Engineering, BCHP Potential

Stanley Consultants, Inc.
8501 West Higgins Road

Chicago, Illinois 60631
312-693-9624

Stanley Consultants, Inc.
225 Iowa Avenue
Muscatine, IA 52761
(563) 264-6457
Capabilities: BCHP Engineering, Environmental and Construction Services

GLHN A&Es
Capabilities: HVAC Engineering, BCHP Potential

Cuh2a, Inc.
Capabilities: HVAC Engineering, BCHP Potential

Epstein and Sons International, Inc.
Capabilities: HVAC Engineering, BCHP Potential

Jacobs Facilities, Inc.
Capabilities: HVAC Engineering, BCHP Potential

General Energy Corp
Capabilities: HVAC Engineering, BCHP Potential

Globetrotters Engineering Corporation
Capabilities: HVAC Engineering, BCHP Potential

Patrick Engineering, Inc.
Capabilities: HVAC Engineering, BCHP Potential

Sebesta Blomberg & Associates, Inc.
Capabilities: HVAC Engineering, BCHP Potential

***NOTE:*** *This list represents only those firms that the MW BCHP Application Center was able to identify at the time of this report. Other firms may exist that promote BCHP; they will be added to the database and will be available over the website in the future as they are identified.*

**Appendix B: Equipment Distributors/Manufactures That Promote BCHP Technologies in Michigan**

ADA Systems
955 North Lively Boulevard
Wood Dale, IL 60191
Capabilities: Evaporative Cooling Systems, Energy Recovery

Caterpillar
Distributor: Patten Power Systems
615 West Lake Street
Elmhurst, IL 60126
(630) 530-4747
Capabilities: Electric Generation Equipment Manufacturer

Charles Equipment
1140 Fullerton Ave
P.O. Box 388
Addison, Illinois 60101
(630) 834-6000
Capability: Design, install maintain CHP equipment

Cummins Onan Northern Illinois
8745 W. 82nd Place
Justice, IL 60458
(708) 563-7070
Capabilities: Electric Generation Equipment Manufacturer

Eisenmann
150 E. Dartmoor Dr.
Crystal Lake, IL 60014
Contact: Mark West
(815) 455-4100
Capabilities: Air Purification

Enercon Engineering
Corporate HeadQuarters
#1 Altorfer Lane
East Peoria, IL 61611
(309) 694-1418
Capabilities: Electric Generation Equipment Manufacturer

Hess Microgen
12 Industrial Parkway, Unit B-1
Carson City, NV 89706

(775) 884-1000
Capabilities: Generators with Heat Recovery

Huntington Environmental Systems, Inc.
707C West Algonquin Road
Arlington Heights, IL 60005
Capabilities: Emissions Control Equipment

JTR Industries, Incorporated
736 Naperville Rd.
Suite 101
Wheaton, Illinois 60187
Capabilities: Electric Generation Equipment Distributor

Kohler Engines
444 Highland Drive
Kohler, WI 53044
Customer Service: 800.544.2444 or 920.457.4441
Literature: 800.544.2444

Patten Power
Corporate Headquarters
615 West Lake St.
Elmhurst, IL 60126
(630) 530-2200
Capabilities: Electric Generation Equipment Distributor

Solar Turbines Incorporated
40 Shuman Blvd. Suite 350
Naperville, IL 60563
(630) 527-1700
Capabilities: Electric Generation Equipment Manufacturer

Trane
7100 Madison
Willowbrook, IL 60521
Phone: 630-734-3200
Fax: 630-323-9040

Wartsila NSD North America Inc.
Phone: (410) 573-2182
Capabilities: Recip. Engines

Waukeshaw
Eastern Regional Office
1000 West St. Paul Avenue

Waukesha, WI 53188
Capabilities: Recip. Engines

Munters
Capabilities: Desiccant Dehumidification Products

GE Power Systems
Capabilities: Combustion Turbine Products

Ingersold Rand
Capabilities: Microturbines

International Fuel Cells, Inc.
Capabilities: Fuel Cells

Yazaki
Capabilities: Thermally Activated Chillers

York
Capabilities: HVAC Systems

Broad
Capabilities: Thermally Activated Chillers

***NOTE:*** *This list represents only those firms that the MW BCHP Application Center was able to identify at the time of this report. Other firms may exist that promote BCHP; they will be added to the database and will be available over the website in the future as they are identified.*

## Appendix C: Property Management Organizations and Firms in Illinois

BOMA Illinois Chapters:

BOMA Chicago
120 South LaSalle Street
Suite 1400
Chicago, IL 60603-3401
(312) 236-5237
FAX: (312) 236-5766
Web: http://www.boma-chicago.org
E-mail: ronvukas@boma.org

BOMA Peoria
Carol Wallace
c/o General Services Administration
100 NE Monroe
Peoria, IL 61602
(309) 671-7215
FAX: (309) 671-7219
E-mail: carol.wallace@gsa.gov

BOMA Suburban Chicago
Patricia Schwarze
Association Executive
1827 Walden Office Square
Suite 375
Schaumburg, IL 60173
(847) 303-9943
FAX: (847) 303-9951
E-mail: bomasch@ix.netcom.com
World Wide Web: www.bomasuburbanchicago.com

Illinois Property Management Firms:

CenterPoint Properties
1808 Swift Drive
Oak Brook, IL 60523
Capabilities: Private Housing

Chicago Housing Authority
626 W. Jackson Street
Chicago, IL 60661
Capabilities: Public Housing

Equity Office Properties Trust
Two North Riverside Plaza
Chicago, IL 60606
Phone: (312) 466-3300

Amdur Associates, Inc.,
4427 RFD,
Long Grove, IL 60047
Phone: 847/478-9654

American Spectrum Midwest, Inc.,
1266 W. Northwest Hwy.,
Palatine, IL 60067
Phone: 847/705-0270

Baird & Warner Management Group, Inc.,
430 N. Michigan Ave., Eighth Fl.,
Chicago, IL 60611
Phone: 312/329-0100

Brian Properties, Inc.,
2045 S. Arlington Heights Rd., Ste. 100,
Arlington Heights, IL 60005
Phone: 847/640-1500

Burnham Management Co.,
225 W. Wacker Dr., No. 1800,
Chicago, IL 60606
Phone: 312/553-0011

CB Richard Ellis, Inc.,
233 N. Michigan Ave., No. 2200,
Chicago, IL 60601-5806
Phone: 312/984-1010

Cecil Management Group, Inc.,
807 W. Hwy. 50,
P.O. Box 459,
O'Fallon, IL 62269
Phone: 618/624-4610

Coldwell Banker Commercial Devonshire Realty,
7707 N. Knoxville, Ste. 201,
Peoria, IL 61614
Phone: 309/692-7707

Coldwell Banker Commercial/Devonshire Realty,
201 W. Springfield Ave.,
Champaign, IL 61824
Phone: 217/352-7712
Colliers International Real Estate Management Services,
9700 W. Bryn Mawr Ave.,
Rosemont, IL 60018
Phone: 847/928-6100

Cushman & Wakefield of Illinois, Inc.,
NBC Tower, Ste. 2800,
455 N. Cityfront Plaza Dr.,
Chicago, IL 60611-5555
Phone: 312/470-1800

Downs, Mohl & Co.,
875 N. Michigan Ave., Ste. 2600,
Chicago, IL 60611
Phone: 312/236-3806

Draper and Kramer, Incorporated,
33 W. Monroe,
Chicago, IL 60603
Phone: 312/346-8600

EPT Management Co.,
70 E. Lake St., Ste. 600,
Chicago, IL 60601
Phone: 312/553-1133
FAX: 312/553-0440

Evergreen Real Estate Services, LLC,
120 S. Lasalle St., Ste. 1510,
Chicago, IL 60603-3574
Phone: 312/372-2266

First Group Management Co.,
77 W. Washington St., Ste. 1005,
Chicago, IL 60602
Phone: 312/346-3434

First Realty Co.,
1117 S. Milwaukee Ave., Ste. A5,
Libertyville, IL 60048-3754
Phone: 847/680-3800

Grubb & Ellis Management Services, Inc.,
2215 Sanders Rd., Fourth Fl.,
Northbrook, IL 60062
Phone: 847/753-7500
Grubb & Ellis Management Services, Inc.,
30 N. LaSalle, Ste. 1500,
Chicago, IL 60602
Phone: 312/224-3990

Hallmark & Johnson Property Management, Ltd.,
6160 N. Cicero Ave., Ste. 620,
Chicago, IL 60646
Phone: 773/545-6160

HSR Property Services, LLC,
19224 School House Rd.,
Mokena, IL 60448
Phone: 708/237-0290

Insignia/ESG, Inc.,
311 S. Wacker Dr., Ste. 400,
Chicago, IL 60606
Phone: 312/935-1400

JFMC Facilities Corp.,
1 S. Franklin, Ste. 2160,
Chicago, IL 60606
Phone: 312/444-2910

Lincoln Property Co.,
2603 22nd St., Ste. 22,
Oak Brook, IL 60523
Phone: 630/954-7000

McLennan Property Management Co.,
25 N. Northwest Hwy.,
Park Ridge, IL 60068
Phone: 847/825-0011

Mid-America Management Corp.,
2901 W. Butterfield Rd.,
Oakbrook, IL 60523

nhs Property Management, Inc.,
3100 N. Dries Ln.,
Peoria, IL 61604

Phone: 309/686-2215

Nimrod Realty Group, Inc.,
1761 Glenview Rd.,
Glenview, IL 60025
Phone: 847/724-7850

Oakbrook Corp.,
55 S. Vail Ave.,
Arlington Heights, IL 60005
Phone:

Partnership Concepts Realty Management,
201 E. Ogden Ave., Ste. 26,
Hinsdale, IL 60521-3697
Phone: 630/325-5800

PM One, Ltd.,
1621 E. 55th St.,
Chicago, IL 60615
Phone: 773/324-9025

Prentiss Properties Ltd., Inc./Midwest,
6250 N. River Rd., #1010,
Des Plaines, IL 60018
Phone: 847/318-0550

Promex Midwest Corp.,
800 S. Milwaukee, No. 170,
Libertyville, IL 60048
Phone: 847/816-6400

Realty & Mortgage Co.,
2459 W. Peterson Ave.,
Chicago, IL 60659
Phone: 773/989-8000

Realty & Mortgage Co.,
300 W. Adams St.,
Chicago, IL 60606
Phone: 312/853-3580

Realty & Mortgage Co.,
928 W. Diversey Pkwy.,
Chicago, IL 60614
Phone: 773/549-8300

Regency Centers Corp.,
One Tower Ln., Ste. 360,
Oakbrook Terrace, IL 60181
Phone: 630-571-4220

Related Management Co., L.P.,
350 W. Hubbard St., Ste. 301,
Chicago, IL 60610
Phone: 312/595-7413
FAX: 312/595-0810

S.P. Management, Inc.,
16238 Prince Dr.,
South Holland, IL 60473
Phone: 708/333-3100

Sudler & Co,
800 Roosevelt Rd., Bldg E., Ste. 402,
Glen Ellyn, IL 60137
Phone: 630/268-1388

Sudler & Co.,
875 N Michigan Ave. Ste. 2600,
Chicago, IL 60611
Phone: 312/751-0900

Trammell Crow Co./Central Division,
Oakbrook Terrace Tower,
1 Terrace Tower, Ste. 200,
Oakbroook Terrace, IL 60181
Phone: 630/773-4100

Transwestern Commercial Services, LLC,
150 N. Wacker Dr., Ste. 800,
Chicago, IL 60606
Phone:

Village Green Management Co.,
500 Park Blvd., Ste. 1140,
Itasca, IL 60143-2609
Phone: 630/250-5800

***NOTE:*** *This list represents only those firms that the MW BCHP Application Center was able to identify at the time of this report.*

**Appendix D: Energy Supply and Service Companies in Illinois**

AES New Energy Inc
309 W. Washington St., Suite 1100
Chicago 60606
(312) 704-9200
Capabilities: Electricity Marketing, Onsite Generation and Natural Gas Marketing

Alliant Energy Corp.,
222 W. Washington Ave.
Madison, Wis. 53703
(800) 521-1725
Capabilities: Electricity Marketing, Onsite Generation and Natural Gas Marketing

Ameren Corp.
1901 Chouteau Ave
St. Louis 63103
(314) 554-2333
Capabilities: Electricity Marketing, Onsite Generation and Natural Gas Marketing

CILCO
300 Liberty St.,
Peoria, IL 61602
888-451-3911
Capabilities: Electricity, Onsite Generation and Natural Gas Marketing

Blackhawk Energy Services
100 N. Lincolnway, Suite B
North Aurora, IL 60542
630-264-6600
Capabilities: Electricity Marketing and Natural Gas Marketing

CMS Marketing Services & Trading Co.
1 Jackson Square, Suite 1060
Jackson, Mich. 49201
(517) 787-8582
Capabilities: Natural Gas Marketing

Energon Inc.
33 North LaSalle, Suite 2400
Chicago, IL 60602
312-443-5700
Capabilities: Natural Gas Marketing

Energy Services Inc.

6033 North Sheridan Road, Suite 42A
Chicago, IL 60660
773-334-3560
Capabilities: Natural Gas Marketing

Enron Energy Services Inc.
12 Salt Creek Lane, Suite 450
Hinsdale, IL 60521
(630) 654-5100
Capabilities: Electricity and Natural Gas Marketing

Enron North America
Capabilities: Onsite Electricity Generation
(312) 541-1717

Exelon Services, Inc.
2315 Enterprise Drive
Westchester, IL 60154
(708) 236-8000
Capabilities: Onsite Electricity Generation

Gulf Pacific Energy
51 Sherwood Terrace, Suite J
Lake Bluff, IL 60045
847 283 9700
Capabilities: Electricity and Natural Gas Marketing
Illinois Natural Gas
1731 Central Street
Evanston, IL 60201
847-491-9500
Natural Gas Marketer

Lower Electric LLC
1307 Shermer Road
Northbrook, IL 60062
847-272-0700
Capabilities: Electricity and Natural Gas Marketing

Midamerican Energy Co.
2811 Fifth Ave.
Rock Island, IL 61201
877-227-5632
Capabilities: Natural Gas Marketing, Onsite Generation and Electricity Marketing

Multiut Corp.
7514 N. Skokie Blvd.

Skokie, IL 60077
847-982-0030
Capabilities: Electricity and Natural Gas Marketing

Nicole Energy Marketing of Illinois Inc.,
18 W. 100 22nd St., Suite 114
Oakbrook Terrace 60181;
(630) 792-9928
Capabilities: Electricity and Natural Gas Marketing

Nicor, Inc.
1844 Ferry Road
Naperville, IL 60563
630-305-9500

NiSource Inc.
801 E. 86th Ave.
Merrillville, Ind. 46410
(877) 647-5990
Capabilities: Onsite Generation and Natural Gas Marketing
Onsite Generation through
Primary Energy Inc. 219 647 6071

Peoples Energy Corp.
130 E. Randolph Drive,
Chicago 60601
(312) 240-4000
Capabilities: Electricity Marketing, Onsite Generation and Natural Gas Marketing

Reliant Energy Inc.
477 E. Butterfield Road, Suite 400
Lombard 60148
(630) 241-1010
Capabilities: Electricity and Natural Gas Marketing

Santanna Energy Services,
120 E. Ogden Ave., Suite 236
Hinsdale 60521
(630) 789-6022
Capabilities: Electricity Marketing, Onsite Generation and Natural Gas Marketing

Siemens Building Technologies, Inc.
1000 Deerfield Parkway
Buffalo Grove, IL 60089
Phone: (847) 215-1000
E-mail: info@sbt.siemens.com

VMC Energy Management Inc
P.O. Box 643
Cary 60013
(847) 639-9118
Capabilities: Natural Gas Marketing

WPS Energy Services Inc.
677 Baeten Road
Green Bay, Wis. 54304
(920) 496-9000
Capabilities: Electricity Marketing, Onsite Generation and Natural Gas Marketing
Onsite Generation through:
WPS Power Development 708 449 4100

***NOTE:*** *This list represents only those firms that the MW BCHP Application Center was able to identify at the time of this report. Other firms may exist that promote BCHP; they will be added to the database and will be available over the website in the future as they are identified.*

## Appendix E: Associations/Organizations Associated with BCHP Deployment in Illinois

### Illinois/Regional Organizations

| | Organization | Website |
|---|---|---|
| 1. | American Institute of Architects | http://www.aia.org |
| 2. | BOMA Building Owners and Managers Association | http://www.boma.org |
| 3. | Center for Neighborhood Technology | http://www.cnt.org |
| 4. | Delta Institute | http://www.delta-institute.org |
| 5. | Energy Resources Center – University of Illinois at Chicago | http://www.erc.uic.edu |
| 6. | Environmental Law and Policy Center | http://www.elpc.org |
| 7. | Gas Technology Institute | http://www.gastechnology.org |
| 8. | Illinois Commerce Commission | http://www.icc.state.il.us |
| 9. | Illinois Department of Commerce and Community Affairs | http://www.commerce.state.il.us |
| 10. | Illinois Environmental Protection Agency | http://www.epa.state.il.us |
| 11. | Interstate Renewable Energy Council (IREC) | http://www.eren.doe.gov/cro |
| 12. | Manufacturing Extension Program (MEP) | http://www.mep.nist.gov/index3.html |
| 13. | Midwest CHP for Buildings Application Center | *Contact through Gas Technology Institute or Energy Resources Center* |
| 14. | Midwest CHP Initiative | http://www.nemw.org/usBCHPa/regional.htm#midw |
| 15. | Midwest Cogeneration Association | http://www.cogeneration.org |
| 16. | Midwest Energy Efficiency Alliance (MEEA) | http://www.elpc.org/energy/index.htm |
| 17. | University of Illinois at Chicago – Energy Resources Center | **http://www.erc.uic.edu** |

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## Federal Government Agencies

| | Agency | Website/Contact Information |
|---|---|---|
| 1. | DOE Combined Heat and Power (BCHP) Initiative | http://www.eren.doe.gov/der/BCHP/ |
| 2. | DOE Distributed Energy Resources (DER) Taskforce | http://www.eren.doe.gov/der/ |
| 3. | DOE Distributed Power (DP) Program | http://www.eren.doe.gov/distributedpower/ |
| 4. | DOE Energy Efficiency and Renewable Energy Network (EREN) | http://www.eren.doe.gov/ |
| 5. | DOE Energy Information Administration | http://www.eia.doe.gov/ |
| 6. | DOE Industries of the Future (IOF) | http://www.oit.doe.gov/industries.shtml |
| 7. | DOE Inventions & Innovation Program (I&I) | http://www.oit.doe.gov/inventions/ |
| 8. | DOE Office of Energy Efficiency and Renewable Energy (EERE) | http://www.eren.doe.gov/ee.html |
| 9. | DOE Office of Industrial Technologies | http://www.oit.doe.gov/ |
| 10. | DOE Office of Power Technologies (OPT) | http://www.eren.doe.gov/power/ |
| 11. | EPA Climate Protection Division (CPD) | http://www.epa.gov/cpd.html |
| 12. | EPA Office of Air & Radiation | http://www.epa.gov/oar/ |
| 13. | EPA Office of Air Quality Planning and Standards | http://www.epa.gov/oar/oaqps/ |
| 14. | EPA-DOE Energy Star Program | http://www.energystar.gov |
| 15. | Federal Energy Management Program (FEMP) | http://www.eren.doe.gov/femp/ |
| 16. | Federal Laboratory Consortium for Technology Transfer | http://www.fedlabs.org |
| 17. | Manufacturing Extension Partnership (MEP) | http://www.mep.nist.gov/ |
| 18. | US Department of Energy (DOE) | http://www.energy.gov |
| 19. | US Department of Housing & Urban Development (HUD) | http://www.hud.gov/ |
| 20. | US Environmental Protection Agency (EPA) | http://www.epa.gov |

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## Others Associations and Organizations

| | Organization/Association | Website/Contact Information |
|---|---|---|
| 1. | Alliance to Save Energy | http://www.ase.org |
| 2. | American Council for an Energy-Efficient Economy (ACEEE) | http://aceee.org |
| 3. | American Planning Organization (APA) | http://www.apa.org |
| 4. | Brookhaven National Laboratory | http://www.bnl.gov |
| 5. | Consortium for Energy Efficiency (CEE) | http://www.ceeformt.org/ |
| 6. | Distributed Power Coalition of America (DPCA) | http://www.dpc.org |
| 7. | Electric Power Research Institute (EPRI) | http://www.epri.com |
| 8. | Electric Power Supply Association (EPSA) | http://www.epsa.org |
| 9. | International District Energy Association (IDEA) | http://www.districtenergy.org/ |
| 10. | National Association of Regulatory Utility Commissioners (NARUC) | http://www.naruc.org |
| 11. | National Association of State Energy Officials (NASEO) | http://www.naseo.org |
| 12. | National Energy Technology Laboratory | http://www.netl.doe.gov |
| 13. | National Renewable Energy Laboratory | http://www.nrel.gov |
| 14. | Natural Resources Defense Council (NRDC) | http://www.nrdc.org |
| 15. | Northeast Midwest Institute | http://www.nemw.org |
| 16. | Oak Ridge National Laboratory | http://www.ornl.gov |
| 17. | Regulatory Assistance Project | http://www.rapmaine.org |
| 18. | U.S. Combined Heat and Power Association (USBCHPA) | http://www.nemw.org/usBCHPa/ |

***NOTE:*** *This list represents only those organizations that the MW BCHP Application Center was able to identify at the time of this report. Other organizations may exist that promote BCHP; they will be added to the database and will be available over the website in the future as they are identified.*

## Appendix F: Distributed Generation – Commercial/Light Industrial Facilities in Illinois

| **Project Type and Name** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Data Centers/Office Buildings:** | **Size (kW)** | **Waste Heat** | **Peak Shaving** | **Back-up Power** | **Cooling** | **In Operation** | **Configuration Available** |
| Equity Office Properties, 30 North LaSalle Bldg, Chicago, IL | 1,200 | √ | | | | | |
| Transamerica, Schaumburg, IL | 750 | | | √ | | Y | 1 |
| G.E. Capital Auto Financial Services, Barrington, IL | 3,000 | | | √ | | Y | 2 |
| MCI/Worldcom, Riverdale, IL | 4,000 | | | √ | | Y | 3 |
| Power Net | 60 | | | | | Y | 4 |
| Van Buren Data Center | - | √ | | | | N | 5 |
| **Sector Total (MW):** | **9,010** | **1,200** | | | | | |
| | | | | | | | |
| **Hospitals:** | **Size (kW)** | **Waste Heat** | **Peak Shaving** | **Back-up Power** | **Cooling** | **In Operation** | **Configuration Available** |
| So. Suburban Hospital, Hazelcrest, IL | 1,000 | √ | √ | | | Y | 6 |
| Christ Hospital & Medical Center, Oak Lawn, IL | 2,000 | √ | | | √ | Y | 7 |
| Little Company of Mary Hospital, Evergreen Park, IL | 4,000 | √ | | | | Y | 37 |
| Sherman Hospital, Elgin, IL | 1,600 | | | | | N | 8 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sisters of Holy Family Saint Mary of Nazareth Hospital Center | 2,400 | | | | | Y | |
| St Francis Hospital, Evanston, IL | 1,600 | √ | | | | N | 9 |
| Saint James Hospital, Chicago Heights, IL | 1,900 | | | √ | √ | Y | 10 |
| Saint Anthony Hospital, Michigan City, IN | 1,200 | | | √ | √ | Y | 11 |
| Resurrection Hospital, 7447 West Talcott Road, Chicago, IL | 1,450 | √ | | | √ | Y | 12 |
| Northwest Community Hospital, Arlington Heights, IL | 3,450 | √ | | | √ | | 13 |
| Alma Nelson Health Care Facility | 195 | | | | | | 14 |
| Park Strathmoor Health Care Facility | 115 | | | √ | | | 15 |
| Condell Memorial Hospital, Libertyville, IL | 500 | √ | | | | N | 16 |
| Lake Forest Hospital, Lake Forest, IL | 3200 | √ | | √ | | Y | 17 |
| Gottlieb Memorial Hospital, Melrose Park, IL | 1600 | √ | | √ | | Y | 18 |
| Presbyterian Homes, Evanston, IL | 3200 | √ | | | | Y | 19 |
| Shapiro Developmental Center/Illinois Department of Mental Health, Kankakee, IL | 1,100 | √ | | | | | 43 |
| Hinsdale Hospital, Hinsdale, IL | 3,240 | √ | | | | Y | 40 |
| **Sector Total (MW):** | **33,750** | **26,340** | | | | | |

| Museums/Zoos: | Size (kW) | Waste Heat | Peak Shaving | Back-up Power | Cooling | In Operation | Configuration Available |
|---|---|---|---|---|---|---|---|
| Brookfield Zoo | 3,800 | √ | √ | | | Y | 21 |
| Art Institute of Chicago | 1,450 | √ | | | | N | 20 |
| **Sector Total (MW):** | **5,250** | **5,250** | | | | | |
| | | | | | | | |
| **Conference Centers:** | **Size (kW)** | **Waste Heat** | **Peak Shaving** | **Back-up Power** | **Cooling** | **In Operation** | **Configuration Available** |
| Trigen-Peoples District Energy Company | 3,300 | √ | | | √ | Y | 22 |
| **Sector Total (MW):** | **3,300** | **3,300** | | | | | |
| | | | | | | | |
| **Schools/Universities/Research Centers:** | **Size (kW)** | **Waste Heat** | **Peak Shaving** | **Back-up Power** | **Cooling** | **In Operation** | **Configuration Available** |
| University of Illinois at Chicago – East Campus, Chicago, IL | 13,000 | √ | | | √ | Y | 23 |
| University of Illinois at Chicago – West Campus, Chicago, IL | 36,000 | √ | | | √ | Y | |
| Mokena School, Mokena, IL | 375 | √ | √ | | | Y | 24 |
| Chicago State, Chicago, IL | 3,500 | √ | | | | Y | 25 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Amoco Research Center Cogeneration Facility | 8,300 | | | | | Y | |
| Board of Education, Evanston Township High School District 202 | 2,400 | √ | | √ | | Y | 26 |
| Illinois Thornton Twnshp Schl Dist 205 | 1,100 | | | | | Y | |
| Thornwood High School | 1,500 | | | | | Y | |
| Abbott Power Plant-Univ of IL/Urbana-Champaign | 30,000 | | | | | Y | |
| Gas Technology Institute | 1,100 | | √ | | | | |
| Center for Neighborhood Technology, Chicago, IL | 28 | | √ | | √ | Y | 27 |
| Illinois Institute of Technology | 7,600 | √ | | | | N | 28 |
| Northeastern Illinois University | 3,100 | √ | | | √ | | 42 |
| Northwestern University | 800 | √ | | | | N | 29 |
| Adlia E. Stevenson High School | 2,100 | | | | | Y | 30 |
| Evanston Township High School | 2,400 | √ | | | | Y | |
| Bartlett High School | 1,600 | √ | | | √ | N | 38 |
| College of DuPage | 2,400 | √ | | | √ | N | 39 |
| Lemont High School | 760 | √ | | | √ | | 41 |
| Lake Park High School, Roselle, IL | 775 | | | | | Y | |
| **Sector Total (MW):** | **118,838** | **73,935** | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Stores:** | **Size (kW)** | **Waste Heat** | **Peak Shaving** | **Back-up Power** | **Cooling** | **In Operation** | **Configuration Available** |
| Walgreen's, Deerfield, IL | 1,600 | | | √ | √ | Y | 31 |
| White Hen Pantry, Bensenville IL | - | | | √ | | Y | 32 |
| **Sector Total (MW):** | **1,600** | **0** | | | | | |
| | | | | | | | |
| **Warehouses/Restaurants:** | **Size (kW)** | **Waste Heat** | **Peak Shaving** | **Back-up Power** | **Cooling** | **In Operation** | **Configuration Available** |
| Asta Health Care | 60 | | | | | Y | 33 |
| Goose Island Brewery, Chicago, IL | - | √ | | | | N | 34 |
| Fannie May Candy | 90 | | | | | N | 35 |
| Heinemann's Bakery | 90 | | | | | N | 36 |
| **Sector Total (MW):** | **240** | **0** | | | | | |
| | | | | | | | |
| **Water Treatment/Resource Recovery Facilities:** | **Size (kW)** | **Waste Heat** | **Peak Shaving** | **Back-up Power** | **Cooling** | **In Operation** | **Configuration Available** |
| DuPage Co Environmental Region 9 West Wastewater Treatment | 1,500 | | | | | Y | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Wastewater Treatment | | | | | | | |
| Fox Metro Water Reclamation District | 2,200 | | | | | Y | |
| Metro Water Reclamation Lockport Powerhouse | 13,500 | | | | | Y | |
| MWRD: Stickney Water Reclamation Plant | 3,000 | | | | | Y | |
| Aurora Sanitary District, Oswego, IL | 2,100 | √ | | | | Y | |
| **Sector Total (MW):** | **22,300** | **2,100** | | | | | |
| **Total all Commercial/Light Industrial Sectors** | **194,288** | **112,125** | | | | | |

The detailed system configurations for each facility are provided below. The number listed next to the facility corresponds to the number in the "Config. Available" column of Table 2.1.

1) Transamerica, Schaumburg, IL
119,000 sf office build-out; 750kW back-up generator for Data Center, critical operations area and heating/cooling of these areas;
Dual utility electrical feed with Automatic Throw Over (ATO) switch;
225kVA UPS system for Data Center loads
Architect: OWP&P

2) G.E. Capital Auto Financial Services, Barrington, IL
265,000 sf complete office reconstruction/addition
Completed in 1998
2 - 1.5MW generators that back up entire building power and cooling
600kW generator for Data Center and life safety systems
225kVA UPS system for Data Center loads
Architect: OWP&P

3) MCI/Worldcom, Riverdale, IL
30,000 sf network information center
Complete in 2000
2 - 2000kW diesel fueled engine generators shall provide backup for all of the electrical and mechanical loads
Onsite fuel storage system capable of sustaining the generators for 72 hours before refueling.
2 - 225KVA UPS systems capable of a minimum of sixty minutes of backup at full load capacity.
Architect: OWP&P

4) Power Net
2-60 kW Capstone Microturbines

5) Van Buren Data Center
7 MW natural gas generating system
Cogeneration – electricity and absorption chilling

Owner: OptimalPath
Project Manager: Peoples Energy

6) So. Suburban Hospital, Hazelcrest, IL
Waukesha Engines
(1) natural gas engine at 1,050 KW
Cogeneration - Peak Shaving
Heat Recovery - Domestic Hot Water
Project Manager: Nicor Solutions

7) Christ Hospital & Medical Center, Oak Lawn, IL
Expansion of emergency power system
with two 1,000 kW engine generators,
Installation of 550 ton absorption chiller.
Project Design: GKC/EME

8) Sherman Hospital
1600 kW Cat natural gas cogeneration with
low pressure steam heat recovery

9) St. Francis Hospital
1600 kW Cat natural gas cogeneration with
low pressure steam heat recovery.

10) Saint James Hospital, Chicago Heights, IL
1200 tons of cooling
3300 ton-hours of ice storage
900 BHP high pressure steam boilers
1000 kW diesel generator
Architect: OWP&P

11) Saint Anthony Hospital, Michigan City, IN
800 tons of cooling
500 BHP high pressure steam boiler
New medium voltage distribution with two substations
2-600 kW diesel generators
Architect: OWP&P

12) Resurrection Hospital, Chicago, IL
2-725 kW naturally aspirated Waukeshaw engines.
Low pressure steam recovery for heating and for
550 ton carrier absorption chiller.

13) Northwest Community Hospital
3,450 kW Cogeneration system together with
three HP boilers, 3400 tons of air conditioning consisting of
two 1300 ton centrifugal and one 800 ton absorber,
Cogeneration system will also produce 6000 lbs of steam/hour, 150 psig.

14) Alma Nelson Health Care Facility
Power generation system consisting of 75 kW and 120 kW generators
with a building automation control system.

15) Park Strathmoor Health Care Facility
115 kW Power Generation System to provide 90% of the facility's
electric requirements.

16) Condell Memorial Hospital
500 kW Cat natural gas reciprocating power cogeneration with
low pressure steam heat recovery.

17) Lake Forest Hospital

3200 kW Cat natural gas cogeneration with
high pressure steam heat recovery.
Operates on peak 3,300 hours/year.

18) Gottlieb Memorial Hospital
2 naturally aspirated 7100 GU natural gas Waukesha engines
each rated at 800 kW.
Medium temperature jackewater with provision for heat recovery.
from exhaust steam and provision for standby and emergency operation.

19) Presbyterian Homes
2400 Cat natural gas cogeneration with low pressure steam heat recovery.
Operates on peak 3,300 hours/year.

20) Art Institute of Chicago
2-725 kW nat. asp. Waukesha engines.
Low Pressure steam used for climate control
Installation pending

21) Brookfield Zoo Waukesha Engines
(2) natural gas, (1) diesel totaling 3.8MW
Power Generation – cogeneration and peak shaving
Project Manager: Nicor Solutions

22) Trigen Peoples District Energy
3-1100 kW Makila Gas Turbines.
High pressure steam used for heating and cooling

23) University of Illinois at Chicago
2-6300 kW dual fuel Cooper Bessemer engines (East Campus - Operating), with heat recovery
2-4000 kW natural gas fired Wartsila engines (East Campus - Operating) with heat recovery and

supplemental firing..
3-7000 kW Solar natural gas turbines (Operation pending - Fall 2001) with heat recovery and supplemental firing.
3-5000 kW natural gas fired Wartsila engines (Operation pending – Fall 2001) no heat recovery
High pressure and low pressure used for heating
Cooling of Campus.
24) Mokena School, Mokena, IL
Waukesha Engine
(1) natural gas engine at 375 KW
Cogeneration - Peak Shaving
Heat Recovery - Boiler Make Up
Project Manager: Nicor Solutions
25) Chicago State, Chicago, IL
Waukesha Engine
(2) natural gas engines at 825 KW each
Power Generatio - Peak Shaving
No Heat Recovery
Project Advisor : Nicor Solutions

26) Evanston Township Highschool
2400 kW Cat natural gas cogeneration with
high pressure steam heat recovery.
Operates on peak 3,300 hours/year.

27) Center for Neighborhood Technology, Chicago, IL
28 kVA natural gas fired micro turbine,
Design of switchgear to accommodate
future addition fuel cells
Thermal storage system for peak shaving
Project Design: GKC/EME

28) Illinois Institute of Technology
2-3.8 MW 501 KB gas turbines.
Steam used for Campus steam system
Installation pending
29) Northwestern University
800 kW Cat natural gas cogeneration with
low pressure heat recovery.
30) Adlia E. Stevenson High School
Electric Only
2.1 MW Reciprocating Engines

31) Walgreen's, Deerfield, IL
100,000 sf new office building
Two new 800 kW generators were installed to provide back-up power for the entire building.
A new 400-kVA UPS system tied into existing 375 kVA UPS. UPS systems were paralleled such that either unit is capable of providing uninterruptible power to the entire campus
600 tons of cooling tied into existing 400 ton chiller
Entire campus can be run from two chillers
Architect: OWP&P

32) White Hen Pantry, Bensenville IL
Microturbine used to ensure power for 24/7 operation and refrigeration
Capstone Microturbine Installation

33) Asta Health Care
2-60 kW Capstone Microturbines

34) Goose Island Brewery, Chicago, IL
6 microturbines with waste heat recovery.
Technology: Capstone Microturbine

35) Fannie May Candy
3-30 kW Capstone Microturbines
Installation pending

36) Heinemann's Bakery
3-30 kW Capstone Microturbines
Installation pending

37) Little Company of Mary Hospital
3,700 kW natural gas turbine cogeneration with
high pressure heat recovery
Operates 24 hrs/day.

38) Bartlett High School
2 Caterpillar 800 kW natural-gas engines
cogeneration system will operate during peak periods
waste heat is used for building, heating and cooling (via absorption chiller).
Installation pending

39) College of DuPage, Glen Ellyn, IL
2,400 kW cogeneration system
3 Caterpillar natural gas fired recip. engines
steam is produced from engine exhaust gas and engine cooling system
Installation pending

40) Hinsdale Hospital
4 Caterpillar natural gas fired recip. engines

41) Lemont High School
Caterpillar 760 kW natural gas engine-generator
Waste heat is used for building heating and cooling (via absorption chiller)

Heat is recovered from both engine jacket and exhaust.

42) Northeastern Illinois University
3,100 kW installation consisting of 4 natural gas fired 775 kW Caterpillar engines.
Waste heat is used for campus heating.

43) Shapiro Development Center
2 Waukesha 575 kW generators
waste heat is used for heating and cooling

***NOTE:*** *This list represents only those commercial and light industrial facilities that the MW BCHP Application Center was able to identify at the time of this report. Other commercial and light industrial facilities may exist that have distributed generation; they will be added to the database and will be available over the website in the future as they are identified.*

## Appendix G: Distributed Generation - Industrial Facilities in Illinois

| Project Name | Size (kW) | Waste | Peak | Backup | Cooling | Operation |
|---|---|---|---|---|---|---|
| Interstate Brands Co Chicago Baking Co | 1,050 | √ | | | | Y |
| Candy Company | 1,380 | √ | | | | Y |
| Kincaid Generation L. L. C. | | | | | | Y |
| A E Staley Manufacturing Co Decatur Plant Cogen | 62,000 | | | | | Y |
| Alpharma Incorporated | 3,300 | | | | | Y |
| Archer Daniels Midland Co (ADM) | - | | | | | Y |
| ADM Chicago | 2,600 | | | | | Y |
| ADM Clinton | 31,400 | | | | | Y |
| ADM Decatur | 261,000 | | | | | Y |
| ADM Galesburg | 3,000 | | | | | Y |
| ADM Peoria | 64,000 | | | | | Y |
| ADM Steger | 1,000 | | | | | Y |
| ADM Taylorville | 4,600 | | | | | Y |
| Armour Pharmaceutical Company Centeon L L C | 4,300 | | | | | Y |
| Bio Energy Partners Greene Valley Gas Recovery (BEP) | 6,000 | | | | | Y |
| BEP CID Gas Recovery | 9,000 | | | | | Y |
| BEP Kankaee County Landfill Gas Recovery | 1,600 | | | | | Y |
| BEP Lake Gas Recovery | 12,000 | | | | | Y |

| | | | | | | |
|---|---|---|---|---|---|---|
| BEP Milam Gas Recovery | 2,400 | | | | | Y |
| BEP Settler"s Hill Gas Recovery | 3,900 | | | | | Y |
| Tazewell Gas Recovery | 1,600 | | | | | Y |
| Woodland Landfill Gas Recovery | 1,600 | | | | | Y |
| Browning Ferris - Mallard Lake Generating Facility | 20,400 | | | | | Y |
| Browning Ferris - Modern L/F Generating Facility | 2,900 | | | | | Y |
| Browning Ferris - Rockford Generating Facility | 2,000 | | | | | Y |
| Browning Ferris - Waukegan Generating Facility | 3,000 | | | | | Y |
| Bunge Foods | 3,800 | | | | | Y |
| City of Kankakee Hydroelectric Facility | 1,200 | | | | | Y |
| Corn Products International -Illinois | 59,500 | | | | | Y |
| Cyprus Rod Chicago, Inc. | 2,300 | | | | | Y |
| CGE Ford Heights, LLC CGE Waste Tires to Energy Project | 23,500 | | | | | Y |
| Dixon Marquette | 14,100 | | | | | Y |
| Duraco Products, Incorporated | 1,600 | | | | | Y |
| FSC Paper Co/Wisconsin Tissue Alsip Paper Condominium Association | 8,600 | | | | | Y |
| General Mills, Inc. - West Chicago | 6,600 | | | | | Y |
| Hoffer Plastics | 7,200 | | | | | Y |
| Tim Huey Corporation(DBA) - Huey Forest Products | 3,000 | | | | | Y |
| Hydro-Op One Associates Dayton Hydro | 3,600 | | | | | Y |
| Ingersol Milling Machine Company | 4,900 | | | | | Y |

| | | | | | | |
|---|---|---|---|---|---|---|
| IMC Nitrogen Co. Imc Nitrogen Co | 3,500 | | | | | Y |
| IVEX Corporation IVEX Corporation | 3,800 | | | | | Y |
| Jacobs Energy Corporation | 5,700 | | | | | Y |
| Jefferson Smurfit Corporation (U.S.) | 12,500 | | | | | Y |
| John Deere Harvester Works | 10,000 | | | | | Y |
| Klein Tools Incorporated - Chicago | 1,600 | | | | | Y |
| Koppers Industries Inc Chicago Plant | 7,500 | | | | | Y |
| KMS Bakery Power Partners L P Entenmann's Co-Generation Facility | 1,600 | | | | | Y |
| Lauhoff Grain Company | 20,000 | | | | | Y |
| LTV Steel-So. Chicago Works | 9,500 | | | | | Y |
| M&M/Mars Inc.- Chicago | 3,500 | | | | | Y |
| Illinois Marathon Oil Co Illinois Refining Division | 12,000 | | | | | Y |
| Marcap Corporation IIT Cogeneration Facility | 8,000 | | | | | Y |
| Mobil Oil Corp Joliet Refinery | 39,600 | | | | | Y |
| Moose International Power House | 2,000 | | | | | Y |
| Nalco Chemical Company | 4,700 | | | | | Y |
| Northern Illinois Gas Company | 2,600 | | | | | Y |
| Panduit Corporation - Tinley Park | 1,500 | | | | | Y |
| Pekin Paperboard Company L/P | 1,500 | | | | | Y |
| PPG Industries, Incorporated - Works 14 | 4,800 | | | | | Y |
| Research Technology Corp. - Biodyne Congress | 4,300 | | | | | Y |
| Research Technology Corp. - Biodyne - Pontiac | 1,800 | | | | | Y |

| | | | | | | |
|---|---|---|---|---|---|---|
| Research Technology Corp. - Biodyne-Lansing | 2,200 | | | | | Y |
| Research Technology Corp. - Biodyne-Lyons | 4,500 | | | | | Y |
| Research Technology Corp. -Biodyne-Peoria | 4,300 | | | | | Y |
| Research Technology Corp. -Biodyne-Springfield | 3,300 | | | | | Y |
| Shell Wood River Refining Company | 20,000 | | | | | Y |
| Solutia INC. W. G. Krummrich Plant | 6,400 | | | | | Y |
| Star-Kist Foods Inc Gaines Pet Foods Corp | 3,200 | | | | | Y |
| STS HydroPower Ltd Dixon Hydroelectric Dam | 3,000 | | | | | Y |
| Viskase Corp Chicago East Plant | 4,900 | | | | | Y |
| Warner-Lambert Company - Rockford | 4,800 | | | | | Y |
| Wells Manufacturing Company-Dura-Bar Division | 6,300 | | | | | Y |
| Elgin Molded Plastics, Elgin, IL | 825 | | √ | | | Y |
| Chicago Paperboard | 1,400 | | | | | Y |
| Lawrence's Fisheries | 60 | | | | | Y |
| C&F Packing | - | √ | | | | N |
| Molex | 2,200 | | √ | | | N |
| USX | 60,000 | | | | | N |
| Finkl Steel | 60 | | | | | N |

**NOTE:** This list represents only those industrial facilities that the MW BCHP Application Center was able to identify at the time of this report. Other industrial facilities may exist that have distributed generation; they will be added to the database and will be available over the website in the future as they are identified.

## Appendix H: Synopsis of Commonwealth Edison Rate 18

**APPLICABILITY.**

This rate is applicable to any customer who (1) has installed his own electric generating facilities or is entitled to the output of electric generating facilities installed for his benefit but owned by a third party solely for financing or tax purposes (Customer's Own Electric Generating Facilities) used exclusively to produce all or a portion of the customer's electrical load requirements on a regular basis, and/or (2) uses another form of energy in the operation of his equipment, and wishes to use the Company's electric service as a standby, auxiliary or reserve service. Such Standby Service provided for temporary backup and maintenance power when Customer's Own Electric Generating Facilities are inoperative on an unplanned or planned basis shall not exceed the Total Capability of Customer's Own Electric Generating Facilities. The customer must state the extent to which such service shall be utilized for load that would have been supplied by the Company under an otherwise applicable rate(s). Each customer served hereunder shall be required to enter into a written contract with the Company incorporating the provisions of this rate.

**Monthly Customer Charge:**

For customers requiring only Standby Service the Monthly Customer Charge shall be

**For a Standby Capacity of:**

| | |
|---|---|
| greater than 10,000 kilowatts | $524.61 |
| 1,000 kilowatts to 10,000 kilowatts | $344.39 |
| 500 kilowatts to less than 1,000 kilowatts | $137.93 |
| less than 500 kilowatts | $106.83 |

For customers requiring both Supplemental and Standby Service

| | |
|---|---|
| Monthly Customer Charge | $98.00 |

**Required Facilities Charge.**

The customer shall be billed a monthly Required Facilities Charge as follows:

| | |
|---|---|
| Charge per kilowatt for kilowatts of Standby Capacity | $ 2.99 |

**Demand Charge.**

Charge per kilowatt for kilowatts of Maximum Demand for Standby Service for the monthly billing period:

For Standby Service for firm load that would otherwise be supplied by the Company under the otherwise applicable rate:

**Summer Months:**

| | |
|---|---|
| For the first 10,000 kilowatts | $15.16 |
| For all over 10,000 kilowatts | $ 6.29 |

**All Other Months:**

| | |
|---|---|
| For the first 10,000 kilowatts | $13.41 |
| For all over 10,000 kilowatts | $ 6.03 |

For Standby Service for interruptible load that would otherwise be supplied by the Company under Rider 26:

**Summer Months:**

| | |
|---|---|
| For the first 10,000 kilowatts | $0.70 |
| For all over 10,000 kilowatts | $0.14 |

**All Other Months:**

| | |
|---|---|
| For the first 10,000 kilowatts | $0.79 |
| For all over 10,000 kilowatts | $0.16 |

**Demand Charge (Continued)**

The monthly demand charges stated above shall be multiplied by a Load Factor Adjustment equal to customer's Demand Peak Period Load Factor for Standby Service for the billing period divided by .71 during the Summer Months or .75 during all other months. The customer's Demand Peak Period Load Factor shall be equal to the customer's Demand Peak Period kilowatt-hours of Standby Service for the billing period divided by the product of the customer's Maximum Demand for Standby Service for the billing period and the number of Demand Peak Period hours in the billing period.

For customers taking both Supplemental and Standby Service, the Supplemental Service will be billed based on the Maximum Demand for such service at the otherwise applicable rate except as provided herein. Maximum Demand for Standby Service will be billed in accordance with the above rate steps, beginning at a demand level equal to the

Maximum Demand for Supplemental Service. For the purposes hereof, the Summer Months shall be the customer's first monthly billing period with an ending meter

reading date on or after June 15 and the three succeeding monthly billing periods.

**Energy Charge.**

The following charges per kilowatt-hour shall apply to all kilowatt-hours of Standby Service supplied by the Company in the month:

**For all kilowatt-hours supplied**

| | |
|---|---|
| During Energy Peak Periods | 5.022¢ |
| During Energy Off-Peak | 2.123¢ |

**MAINTENANCE POWER.**

Maintenance power is temporary service to meet the customer's needs during periods of scheduled equipment downtime for maintenance of the Customer's Own Electric Generating Facilities, however, the total number of days containing Peak Periods for which maintenance power will be allowed for each generating unit comprising the

Customer's Own Electric Generating Facilities shall not exceed 42 each year. Maintenance power will be provided for levels not to exceed the level of Standby Capacity. Annually, prior to December 31, the customer shall provide the Company in writing his preliminary schedule of maintenance power during the succeeding year. If maintenance is scheduled for the fall or spring months, the customer may adjust his maintenance schedule by giving written notice 45 days in advance of date preliminarily scheduled. If such service is provided during the spring (March, April and May) or fall (October and November) periods, the customer shall receive a 50% reduction in demand charges for Standby Service applicable to maintenance power. Scheduled periods of maintenance power may be changed upon mutual agreement by the customer and the Company in advance of the schedule. The customer shall be billed maintenance power in accordance with the agreed upon schedule. The charges for energy consumed in conjunction with maintenance power shall be as set forth above.

**Total Capability of Customer's Own Electric Generating Facilities.**

The Total Capability of Customer's Own Electric Generating Facilities shall be equal to the average of the three highest maximum 30-minute metered outputs as measured by the Generator Meter for the last twelve consecutive billing periods including the current billing period, not more than one such maximum selected from each billing period,

or such other capability which represents typical maximum operation of the unit as mutually agreed to between the customer and the Company. If the Company is providing Standby Service for another form of energy used by the customer, the customer shall provide ratings and usage information necessary to determine the electrical load of

backup equipment.

**Total Load.**

For each 30-minute period, the customer's Total Load shall be the sum of the 30-minute load on the Main Meter and the 30-minute load on the Generator Meter for such period.

**Supplemental Service Level.**

The Supplemental Service Level for a billing period shall equal the highest Total Load established during the Demand Peak Periods for the billing period minus the Total Capability of Customer's Own Electric Generating Facilities.

**BILLING QUANTITIES.**

**Supplemental Service.**

For each 30-minute period, the demand for Supplemental Service shall be the lesser of the demand measured on the Main Meter for such period and the Supplemental Service Level established during the current billing period.

**Standby Service.**

For each 30-minute period, the demand for Standby Service shall equal the demand measured on the Main Meter minus the demand for Supplemental Service for such period.

**MAXIMUM DEMAND FOR SUPPLEMENTAL AND STANDBY SERVICES.**

For customers with 30-minute total demands (Standby Service plus Supplemental Service) exceeding 1000 kW in three of the 12-months preceding the billing period, the Maximum Demand for Standby Service shall be the average of the three highest 30-minute demands established during the Demand Peak Periods for such service in such billing period provided that not more than one such demand to be selected from any one day. In addition, the following definition for Maximum Demand for Supplemental Service shall be used in lieu of the definition for Maximum Demand set forth in the

applicable rate for such service. Maximum Demand for Supplemental Service shall be the average of the three highest 30-minute demands established during the Demand Peak Periods for such service in such billing period provided that not more than one such demand to be selected from any one day. For all other customers, the single highest 30-minute demand established during the Demand Peak Periods of the billing period for both Standby and Supplemental Service will be substituted for the foregoing average demands.

**STANDBY CAPACITY.**

The customer shall elect a level of Standby Capacity which shall not exceed the sum of the Total Capability of the Customer's Own Electric Generating Facilities. The Standby Capacity shall be no less than the highest Maximum Demand for Standby Service for the last twelve consecutive billing periods including the current billing period.

Whenever the Maximum Demand for Standby Service exceeds such previously established highest Maximum Demand for Standby Service, the Standby Capacity shall

be immediately changed, without notice or other action, to the new level of such highest Maximum Demand. Such increased Standby Capacity shall not exceed the Total Capability of the Customer's Own Electric Generating Facilities and shall be used for the entire billing period during which the Standby Capacity is increased.

**SERVICE AND METERING FACILITIES.**

A customer served hereunder shall reimburse the Company in accordance with Riders 6 and 7 for the cost of metering facilities and any other facilities the Company must install to connect the customer to the Company's system, to the extent the cost of such facilities exceeds the cost of facilities the Company would provide as standard under its otherwise applicable tariff provisions in order to serve the customer's Supplemental and Standby loads combined.

**PARALLEL OPERATION.**

The customer shall not operate his own power production equipment in parallel with the Company's service, except upon the written consent of the Company. However, if the Customer's Own Electric Generating Facilities are allowed to operate in parallel with the Company's facilities, the Company will install, at the customer's sole expense, appropriate metering to measure the flow of energy, if any, from the customer's facilities into the Company's system under the provisions of Rider 4, Parallel Operation of Customer's Generating Facilities.

**LIABILITY.**

A customer taking service hereunder shall indemnify the Company and its other customers against any liability for personal injury or property damage arising from or created by the interconnection or operation of the customer's electrical generating equipment, and against any and all loss resulting from demand established by the customer in excess of the capacity of the Company's facilities installed hereunder.

**GENERAL.**

Energy Peak periods, for purposes hereof, shall be the hours of 9:00 a.m. to 10:00 p.m. on Monday through Friday, except on days on which the following holidays are generally observed: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day and, if one of the foregoing holidays occurs on a Tuesday or Thursday, the immediately preceding Monday or immediately following Friday, respectively. Energy Off-Peak Periods shall be all other hours.

Demand Peak Periods for purposes hereof, shall be the hours of 9:00 a.m. to 6:00 p.m. on Monday through Friday, except on the holidays designated above. Demand Off-Peak Periods shall be all other hours.

The Schedule of which this rate is a part includes certain general Terms and Conditions and Riders. Service hereunder is subject to these Terms and Conditions and the Riders applicable to this rate.

## Appendix I: Illinois Commerce Commission - Distributed Resources Questionnaire (Spring 1999)

Distributed Resources

Electric Policy Committee of the Illinois Commerce Commission

Commissioner Terry S. Harvill, Chair

suppliers and by the early part of the next decade all customers will have the opportunity to choose alternative sources of supply in Illinois. Competition in the electric industry promises to provide new products and services. The Commission's role in this process is to promote the opening of these new markets so a varied array of products and services can be provided in an efficient manner. The Commission has unbundled delivery services from generation services and is currently in the process of unbundling delivery services (ICC Docket No. 99-0013).

While some customers have chosen alternative suppliers, other customers have shown an interest in distributed resources (e.g., small scale generation). As this past summer reminds us, for electric supply to be reliable, the transmission and distribution grid must also be reliable. Distributed resources can be used in a number of ways to provide value-added services in addition to power and energy as well as playing a role in maintaining the reliably of supply. It is therefore important to understand the issues surrounding distributed resources not only because they provide customers with additional choices, but also because they may represent a potential reliability enhancing measure.

The following question are designed to provide the Electric Policy Committee with the necessary background to begin the discussion of distributed resources and their role in the electricity market in Illinois. After the comments are filed, the Committee will put together a series of meetings related to this issue. As a practical matter, not all parities wishing to address the Committee on these important issues will have the opportunity to do so. The responses to these questions will provide one forum for those parties to have their opinion heard. Parties need not address all questions and are welcome to provide the Committee with additional relevant comments. Please send all comments via e-mail to Carl Peterson (cpeterso@icc.state.il.us). The deadline for comments is December 15, 1999.

1. Please provide an exact definition of a distributed resource (DR). For example, is a distributed resource only small scale generation? If so, of what size? Should DSM services also be included in the definition?

    - How can DR be used either in conjunction with traditional utility service or as a stand-alone service to meet customers' demands?
    - Can DR be effective in providing loading relief for transmission and distribution systems?
    - Should DR be considered when planning for and expanding the T&D system?
    - What new technologies can be used in conjunction with DR to lower costs and improve service?
    - Are there any other benefits from DR (e.g., environmental)?
    - What are the drawbacks of DR (e.g., utility operations, public health and safety, etc.)?

Please include examples of currently deployed distributed resources either in Illinois or other jurisdictions and explain exactly what services (or value) these resources provide. (If providing examples of DR outside of Illinois, please indicate any unique features of the regulatory or legal environments of that jurisdiction that differentiate it from Illinois as it pertains to DR.)

1. What is the market penetration for DR in Illinois (include self-generation and co-gen if not included in your definition provided in question 1)?
2. What should the Commission's role, if any, be in promoting this market? If the Commission should have a role, please provide an outline of actions the Commission can take along with a timetable.

    - How does the manner in which the Commission has unbundled delivery services from generation services impact the cost-effective application of distributed resources?
    - What aspects of current delivery service rate design should be altered to facilitate the cost-effective deployment of DR?
    - Should delivery service rates be geographically differentiated to provide the appropriate price signals to locate DR in areas that need distribution upgrades?
    - Should the Commission develop a common set of interconnection rules/tariffs for the state?
    - What other changes in legislation, rules, tariffs, unbundling polices and interconnection practices are needed to facilitate the deployment of cost-effective distributed resources?

3. What are the requirements in terms of metering, metering standards, data control and management, communications and utility operations for the central dispatch of distributed resources? (Please provide a summary of the assumptions made

concerning the distributed resource technology, the structure of the electricity market and the nature of the distribution system used to formulate your answer.)

4. What aspects of past distribution planning and deployment hinder the development of the DR market? Are there specific areas on any utility's system that are particularly problematic for DR? What actions can the Commission take to alleviate any perceived problems?
5. Do the incentives currently inherent in the regulation of the incumbent electric utilities hinder or facilitate the cost-effective application of distribute resources by alternative suppliers? Please explain. If the current structure hinders efficient deployment, what changes are needed?
6. Does the incumbent utility have any market power associated with planning, leasing or dispatching DR? Is this any different from central station generation? Can that market power be mitigated? How?
7. What other issues or problems arise from the incumbent utility owning, operating and deploying DR?
8. How is the natural gas industry impacted by DR? Is there a need for changes in the rules, practices, tariffs or market structure to facilitate the cost-effective application of DR?
9. How does the deployment of DR impact competition for the <u>delivery</u> of power and energy?
10. Please provide any additional comments (you may include procedures for the Commission to address any issues that are of concern.).