

**STATE OPPORTUNITIES FOR ACTION: REVIEW OF STATES'
COMBINED HEAT AND POWER ACTIVITIES**

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SUMMARY/PURPOSE

Combined heat and power (CHP) has been the focus of federal attention since the mid-1990s. However, many of the market barriers to CHP are at the state level. As a sign of the maturing of the CHP market, a number of states are now undertaking activities to address barriers to CHP, and some states have begun to provide incentives to encourage the development of systems in their states.

This report, the first phase of a larger project, outlines current state-level activities regarding CHP in the areas of interconnection, emissions standards, and financial incentives offered for CHP. During the research for this report, the authors encountered many difficulties in obtaining information and also discovered many barriers to the installation of CHP that are not specifically covered here. These other barriers include complex rate design issues that are utility-based as opposed to state-based. Utility regions are only covered topically and where they are clearly the largest barrier or incentive. Moreover, because this report intends to educate the public about the difficulties of installing CHP, specifically not covered in this report are utility-owned CHP facilities and large investor-owned utilities (IOUs).

BACKGROUND

Distributed generation (DG) is defined as any technology that produces power off the electric grid (Shiple and Elliott 2000). About 60% of CHP installations are considered DG—only large central generation CHP is not included. Because this report focuses on smaller CHP, we can consider the barriers for these installations to be the same as for DG. CHP is not a technology, but an approach to applying technologies. A CHP system produces both useful heat and power from one fuel source. By combining the production of these energy streams, much of the waste heat that would result from power generation can be avoided, as shown in Figure 1 (Elliott and Hedman 2001).

Increased interest in DG and the type of CHP discussed in this report is attributable to multiple changes in the energy market over the last 30 years. Perhaps the most major of these is the deregulation of the energy market. In theory, deregulation opened the market to individual power producers and merchant plants to sell their power just as the large utilities of the past would. This allowed industrial facilities to take advantage of fluctuating prices. In some cases selling the energy they produce is more profitable than using it to manufacture their own products.

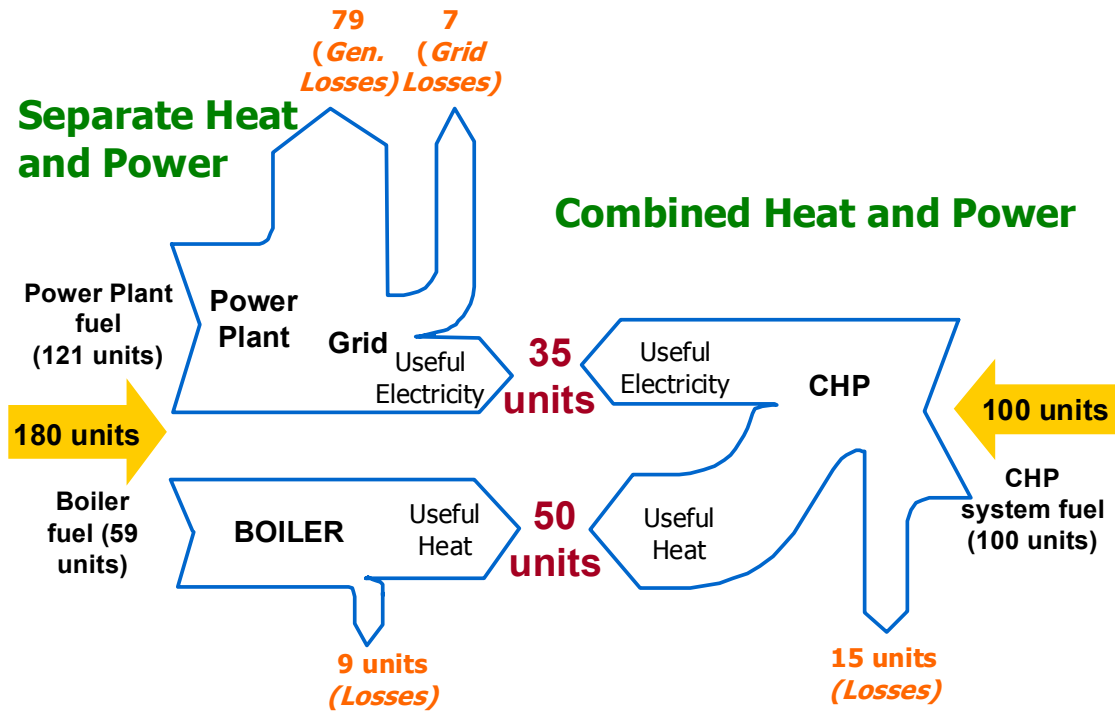


Figure 1. Schematic Comparing Separate and Combined Heat and Power Systems (Source: Elliott and Hedman 2001)

Another possible reason for increased interest in DG is a heightened focus in national energy security (Lovins and Lovins 2001). Since the terrorist attacks on September 11, 2001, many issues have arisen regarding energy security, focused on protecting central generation plants. Another important aspect of national energy security is resilience of the grid (Gordes

2002). One of the benefits of distributing power over the entirety of the grid instead of using central generation is that many small power plants are harder to cut off than one large plant.

The most widespread, if not mundane, issue driving the mainstreaming of DG is increased stress on the deliverability aspect of the electricity grid, as well as growth of larger and larger areas of environmental pollutant non-attainment. Clean CHP is a clear solution for these areas, given that it uses a single fuel to complete the same processes that require two fuels in a traditional system. One example of this is the state of Texas, especially the Houston area. Through clean DG, the area has the potential to both decrease stress on the grid and pollution (Elliott and Hedman 2001). The problem, however, in Houston and all over the country is the numerous barriers that exist for CHP. Many factors affect the ease of installation of CHP in states: utility commission regulations, state legislation, permitting by the environmental regulatory bodies within the state, and individual utilities.

Barriers to CHP

Traditional barriers to CHP derive from a monopoly-oriented electricity grid system based on central station generation. Coupled with the rate design issues within this model, there are both technical and institutional problems with establishing a system of DG for the electric grid. Over time, as interest in DG has increased, these barriers have been approached from a variety of angles. There have been many studies regarding the importance and barriers to CHP and DG, so they will not be detailed here (Elliott and Hedman 2001; Elliott and Spurr 1999; NREL 2000; Shipley and Elliot 2000).

Interconnection

Initially, technical difficulties with interconnection to the utility grid were the largest problems for any small or non-utility generator. These barriers included safety standards, issues regarding grid reliability and power quality, and transmission difficulties regarding capacity. In 2000, the National Renewable Energy Laboratory released a report categorizing the barriers for distributed power projects (NREL 2000). As explained in that report, many of these technical barriers have been reduced or overcome, but utilities have not always updated their rules to keep pace with technological advances, or chosen to respond to developments. Exhaustive barriers, from pre-certification to extensive testing and planning, often discourage interconnection to the grid.

Emissions

Because it uses a single fuel to produce both electricity and heat, CHP can be a more efficient use of fuel (see Figure 1). The current efficiency standards for generation and air quality do not account for this efficiency gain since the standards use input of fuel measurements, not output of energy (Shipley et al. 2001).

Why State Action?

Since the electricity grid transmission system spans over all the states, it could be argued that the federal government is the best candidate for encouraging CHP capacity growth. The federal government is taking action in at least two ways. There is currently a Public Notice of Proposed Rulemaking (NOPR) on standards for an interconnection rule under consideration by the Federal Energy Regulatory Commission (FERC). In June 2002, the FERC received comments on the NOPR and is currently expected to make a final ruling in the fall/winter of 2002.

It is possible that the current federal initiative for updating the New Source Review (NSR) will change federal emissions regulations for CHP applications, but there is no clear path to that at this time. ACEEE's research found no other federal initiatives for converting the emissions system to an output-based standard.

While progress on the federal front is important in the long run, there are various reasons states have an equal opportunity to take action. First, states already have their various offices overseeing connection to the distribution grid and power production. Second, at the state level, legislators and offices know the needs of their states and the condition of the grids very well, so programs can be tailored to the needs of the states. Third, states may already have programs or incentives (typically for photovoltaics or wind) that can act as the groundwork for incentives for CHP. Clearly, state action that works in tandem with federal action would be the smoothest and quickest way to encourage installation of CHP facilities.

METHODOLOGY

Literature Review

Before conducting the surveys that are the basis for most of this report, ACEEE conducted a literature survey to determine what information is currently available. Following is a description of available literature.

The National Renewable Energy Laboratory (NREL) undertook significant work in the late 1990s to compile case studies on distributed energy projects in various locations around the country. This work included categorizing the barriers to a number of projects including several CHP projects (NREL 2000).

A significant amount of research has been published on net metering. All interconnections to the grid need some metering rule from the relatively large solar and wind to small-scale generation sectors. Not all net metering rules apply to CHP facilities, but an excellent source of all state net metering laws is a table put together by Thomas Starrs in 1996 (Starrs 1996).

EFI/XENERGY, Inc. produced a listing of incentives for distributed energy resources for all the states. This report covers all financial incentives and loan programs for renewable and

efficient technologies. The most helpful aspect of this report, is its level of detail down to the individual utility for most states (EFI/XENERGY, Inc. 2001).

A small but important body of research has been published regarding utility interconnection fees (Ferrey 2000). Often, these stand-by and exit fees are the determining barriers for potential projects. These charges are problems unique to deregulating and deregulated states, but as more states move to open electricity markets, as do the complications with these fees. In order to sort out the technical and market potential for CHP nationwide, the U.S. Department of Energy’s Energy Information Administration commissioned Onsite Sycom Energy Corporation to review both the commercial and industrial sectors. Its report describes both current capacity and potential in all the states (Onsite Sycom 2000a; 2000b).

Survey Methodology

ACEEE conducted the survey research for this report in order to form a comprehensive reference work for designers and legislators to look to for ideas and information regarding CHP projects in their states. To gather information from states, the researchers contacted the public utility commissions (PUC) and the state energy office (SEO) in each state. Once a suitable contact in each office was found, phone or e-mail interviews were conducted using the questions summarized in Table 1.

Table 1. Summary of Preliminary Questions for PUCs and SEOs

<p>Questions for State Utility Commissions</p> <p>Does your state utility commission have any policies regarding CHP installation (e.g., inter-connection to the grid)?</p> <p>Does your state have any emissions regulations regarding CHP?</p> <p>Do you know of any companies that have attempted an installation?</p> <p>Are there any special rates or other provisions available for CHP or clean power?</p> <p>Questions for State Energy Offices</p> <p>Are there any state regulation for the installation of CHP?</p> <ul style="list-style-type: none"> Emissions Interconnection Rate design Siting regulations <p>Is there a state incentive for CHP installation?</p> <ul style="list-style-type: none"> Tax credits Project co-funding or loans
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The preliminary questions led to follow-up calls and Internet research, leading ACEEE to a wealth of information in most cases. As the study progressed, it was determined that contacting the state environmental protection agencies was the best approach for determining if the states had special emissions permitting opportunities for CHP. These agencies were then contacted.

RESULTS

The data were compiled on a state-by-state basis and complete results are shown in the appendix. Table 2 summarizes the appendix. The first column indicates the availability of a state-level incentive for CHP. The second column indicates (where applicable) the existence of interconnection standards in the state and which agency has them. If no standardized interconnection agreement system exists in the state through either the Public Utility Commission (“P”) or state (“S”), the utility companies (“U”) determine the interconnection rules on an individual basis. The final column represents the emissions regulations regarding CHP in the state. All the states have pollution regulations for most power-producing facilities (with the exception of emergency generators), but not many of these regulations take into consideration the increased efficiency of CHP by using output-based standards. States that do take this into consideration are marked in the last column with an “S.” States not listed in Table 2 fall into the category of “NUN”: no state-level financial incentives (“N”); the utility (“U”) regulates interconnections to the grid; and there are no state-level special emissions rules for CHP (“N”). For more in-depth information, please refer to the appendix where the data is organized by state.

Table 2. Summary Results for State Activities

State	Financial Incentives	Installation/ Interconnection	Emissions Regulations
Arizona	N	P*, U	N
Arkansas	N	P	N
California	N	S	S
Connecticut	N	P*, U	S*
Delaware	N	P^, U	N
Florida	N	S^, U	N
Georgia	N	S^, U	N
Hawaii	S	U	N
Illinois	N	P*, U	N
Indiana	S	P*, U	N
Maine	N	P^, U	N
Massachusetts	N	U	S*
Michigan	S	S	N
Minnesota	N	S*, U	S*
New York	S^	P	S*
North Carolina	S	U	N
North Dakota	N	U	N
Ohio	N	P	N
Pennsylvania	N	P	S*
Texas	N	P	S
Virginia	N	P*, U	N
West Virginia	N	P	N
Wisconsin	P	P*, U	N

Key: N = no special considerations for CHP; S = state; P = public utility commission or equivalent; U = utility; * = in progress; ^ = offers standards to a certain size (or type—NOT CHP) of distributed generation

EMERGING TRENDS

Although progress in overcoming the barriers to CHP is just beginning, several states have made significant steps toward encouraging the practice. ACEEE found increasing knowledge of CHP and cogeneration at the state level, in both energy and environmental offices. The progress of states varies widely at attacking barriers and depends largely on the progress of deregulation, the authority of the Public Utility Commission, the local utilities, the need for supplemental generation, and the size of the areas of pollutant non-attainment. The following section outlines the steps that three states (Texas, California, and New York) took in order to add CHP to their generating capacity. Clearly, this work is specific to each state and would need to be adjusted to apply to other states based on their needs, but it is a good starting place for many states looking for ways to increase their CHP capacity.

Interconnection: Texas and California

In some cases, CHP projects would be able to proceed if the interconnection procedures for generators were standardized through a process of lawmaking or rulemaking within the state that would simplify the procedures or set a recognized standard. Both Texas and California have developed state-level interconnection standards (CEC 2002; TNRCC 2001). These standards represent a compromise between utilities and generators. Although different in some specifics and primary motivation, the guidelines are similar in that they both accomplish the goal of creating a relatively rapid and standard procedure for all generators looking to connect to the grid.

The state of Texas has the largest installation of DG in the United States (Elliott and Hedman 2001). There are many reasons for this, not the least of which being Texas's enormous size and large amount of industrial facilities in parts of the state. In cities in Texas, (especially Houston), the state was confronting the lack of generation capacity as well as increasing areas of pollutant non-attainment (described below). For these reasons, the state government of Texas realized that DG was necessary to keep the lights on (and the factories working) in its major cities.

The Texas Public Utility Regulatory Act of 1999 granted all utility customers access to DG. On February 4, 1999, the Texas Public Utility Commission (PUCT) adopted interconnection standards (PUCT 1999). The PUCT continued investigations into DG in Texas and in May 2002 a guidebook to interconnection in Texas was published by the PUCT (PUCT 2002). The guidebook is intended to outline procedures for small-scale DG and CHP generators and to stand as a uniform reference for all parties involved. The PUCT will continue to update this volume and also expand its work on DG.

California's decision to expedite the streamlining of interconnection procedures was the result of its well-publicized problems in 2000 and 2001. Although there are multiple reasons that California had to resort to rolling blackouts, increasing DG is a way to remove pressure from the grid, decreasing the likelihood that the blackouts will be repeated.

A state DG plan (CEC 2002) was completed, which included a plan for standardized guidelines for interconnection to the grid. In 2002, the California Energy Commission's (CEC) Rule 21: Interconnection Working Group completed these guidelines. Shortly after their completion, the California Public Utilities Commission adopted the standards. Individual utility versions of the interconnection standards can be found at

http://www.energy.ca.gov/distgen/interconnection/california_requirements.html.

An interesting aspect of California's interconnection program is how smoothly the state agencies are working together. The CEC works in tandem with the California Public Utilities Commission (CPUC) to create an environment where CHP and DG are encouraged. These offices are also working closely with the California Air Quality Resources Board to further open up the CHP market. This close working group of agencies is helpful to the regulatory process in that it assures that there will be no cross or split incentives and that all the aspects of barriers to DG are confronted. To coordinate the effort, the CEC runs an information website that serves as a clearinghouse, which is located at

<http://www.energy.ca.gov/distgen>.

Emissions: Texas

Texas is faced with significant environmental challenges due to its expanding need for power and existing air quality challenges (Elliott and Hedman 2001). The Texas Natural Resource Conservation Commission (TNRCC) has recognized the contribution that CHP could make to addressing these linked problems, and confronted the barrier of CHP appearing less efficient due to input-based standards by altering the generator guideline to reflect output-based standards. This brief guideline is located at

http://www.tnrcc.state.tx.us/permitting/airperm/nsr_permits/files/segu_permitonly.pdf.

It allows for the efficiency of CHP applications to be recognized. This rule works in conjunction with the interconnection guidelines issued by the PUCT to significantly lower installation and operating barriers to CHP.

Programs: New York

The New York State Research and Development Authority (NYSERDA) is tasked with allocating New York State's public benefit fund. This organization recognizes the benefits of CHP, which is reflected through an approximately \$15 million grant program for CHP research and development, as well as demonstration projects. Eligible projects for the grant money include development and commercialization of CHP systems, feasibility studies and case studies of CHP facilities. A number of the projects are regarded as successful, as reviewed at a workshop in June 2002. It was clear that the demonstration funds reduced facility managers' (in industrial, residential, and commercial settings) perceived risk of investing in CHP projects. This has allowed CHP to reach a broader market: these projects show a large commercial and industrial audience both the benefits and the process for

installing CHP, thereby encouraging its use in New York. The program now receives several hundred proposals annually for the installation of CHP.

CONCLUSIONS AND NEEDS FOR FUTURE WORK

This report reviews state approaches to promoting the use CHP by categorizing the states' barriers to CHP by state. Many states have yet to take steps to encourage CHP, but the goal of this report is to assist states in finding a place to start and help designers and installers review the various issues surrounding CHP at potential project locations. ACEEE found that while many states have yet to begin efforts to create a market for clean CHP, there are a few states that have made significant progress and can serve as models. In particular, Texas, New York, and California can offer models that other states can look to in developing state program and regulations.

Because of the continuously changing environment of state regulation and legislation, the information in this report will need to be continually updated. Creating a database of state incentives and approaches to barriers that is highly accessible to both states and designers would create a single access point for CHP information.

Another important finding is that many of the interconnection barriers exist at the individual utility level, not the state. Many of the people contacted for this report indicated that it was the utility that was discouraging CHP installation. A systematic survey needs to be conducted of major utility policies relative to CHP. This effort was beyond the scope of this initial study, but ACEEE hopes to continue this work in conjunction with other groups such as the United States Combined Heat and Power Association (USCHPA).

Another issue identified in the survey but not included in this report is local tax treatment of certain types of alternative financing strategies, in particular lease agreements. In some locales, lease payments may be subject to gross-receipts taxes. Again, this topic was beyond the scope of this project, but research could provide important intelligence for developers, as well as identifying a local barrier that could be addressed by exempting CHP systems from these taxes.

While the opportunities for electricity savings through CHP are large, realizing this opportunity requires breaking down the barriers to CHP, following the lead of key states, and building on their progress. Although California, Texas, and New York have made significant progress identifying and overcoming barriers, significant state work remains to be done. This work needs to coordinate with the federal activity and utility activity to create an atmosphere conducive to CHP and electricity savings.

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APPENDIX: STATE-BY-STATE ACTIVITY REGARDING CHP

Alabama

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

None

Emissions Regulations/Rules Specific to CHP

None

Alaska

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

None

Emissions Regulations/Rules Specific to CHP

None

Arizona

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

In 1999, the Arizona Corporation Commission (ACC) formed a DG Working Group to investigate DG and interconnection in the state. The working group produced a final report for the ACC that summarizes the next steps for mainstreaming DG in Arizona. The report can be found at <http://www.cc.state.az.us/meetings/minutes/dgirpt7.pdf>. Since its publication, however, the ACC has not followed up on any of the suggestions (Keene 2002).

Emissions Regulations/Rules Specific to CHP

None

Other Barriers or Incentives for CHP

The ACC runs a program that allows net metering for cogeneration systems less than 100 kilowatt (kW). Net energy is purchased at avoided cost, and the program applies to all IOUs and Rural Electric Cooperatives (Starrs 1996).

Arkansas

State-Level Financial Incentives

None (Benson 2002)

Interconnection Provisions/Net Metering

In 1983, the Arkansas Public Service Commission (PSC) published its interconnection rules, closely following the federal Public Utility Regulatory Policy Act (PURPA) rules. Arkansas's rules can be viewed at http://170.94.29.3/rules/cogeneration_rules.pdf.

In 2001, Arkansas passed a net metering rule through Act 1781, "The Arkansas Renewable Energy Development Act of 2001" (Assembly of Arkansas 2001). The bill directed the Arkansas PSC to carry out the rulemaking process. The process is in the comment period, with most difficulties encountered pertaining to how to credit small generators for their electricity produced (Kalland 2002). Entergy, a utility that covers three-quarters of the state usage, has an interconnect tariff based on the federal North American Electric Reliability Council (NERC) planned tariff (Olivier 2002).

Emissions Regulations/Rules Specific to CHP

None (Rhueame 2002)

California

State-Level Financial Incentives

The CPUC runs the Self-Generation Incentive Program, which offers incentives to clean DG up to 1 megawatt (MW). These incentives are equal \$1.00/watt up to 30% of the project cost (Gallaway 2001). More information on this incentive can be found at http://www.pge.com/selfgen/pdf/Program_Handbook_R2_Final_05-06-02.pdf.

Interconnection Provisions/Net Metering

CHP is covered under "Rule 21"—DG tariffs by the California Public Utility Commission. Rule 21 can be found at

http://www.energy.ca.gov/distgen/interconnection/california_requirements.html. California is the first state to have a standard practice for interconnection for every utility in the state's jurisdiction. No net metering for CHP.

Emissions Regulations/Rules Specific to CHP

Set by local air quality districts.

In 2000, Senate Bill 1289 was signed into law requiring the California Air Resources Board to implement a certification program for DG units that are exempt from local air district permits. Exempt units are typically smaller units, but not emergency generators. The 2003 standards have a CHP provision that allows for a minimum 60% efficiency and slightly higher emissions standards to balance the offset in emissions that CHP provides (Surovik 2002). Further details can be found at <http://www.arb.ca.gov/energy/dg/dg.htm>.

Other Barriers or Incentives for CHP

The CEC has made removing barriers to small generators a priority. This is made evident by the Distributed Energy Strategic Plan, which can be found at http://www.energy.ca.gov/distgen/strategic/strategic_plan.html.

Colorado

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

No standard interconnection requirement. Net metering for renewable energy sources.

Emissions Regulations/Rules Specific to CHP

None

Connecticut

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Connecticut has no standardized provisions for interconnection aside from the PURPA qualifying facility (QF) guidelines. Facilities that are not QFs under PURPA negotiate with the utility on an individual basis. The Department of Public Utility Commissioners will issue a report in 2002 that will announce that they will be starting work on interconnection standards (Quinlan 2002).

Emissions Regulations/Rules Specific to CHP

The Connecticut Department of Environmental Protection's Air Quality Division was involved in the design of the Regulatory Assistance Project (RAP) output-based standards for DG. The state has yet to adopt an output-based standard of its own.

Other Barriers or Incentives for CHP

It is possible that the largest barrier to grid interconnection in the state is the lack of a model for utilities to follow regarding interconnection (Gordes 2002).

Delaware

State-Level Financial Incentives

Delaware does not offer a rebate for CHP, but Connectiv Power's Delaware Energy Alternatives Program offers a rebate for renewable technology. This program could be viewed as a precedent for a CHP rebate program in Connectiv's territory. More information on this program can be found at

http://www2.state.de.us/publicadvocate/dpa/html/self_gen.asp.

Interconnection Provisions/Net Metering

Generators less than 1,000 kW that seek interconnection must follow the Connectiv Technical considerations. These are found at http://www2.state.de.us/publicadvocate/dpa/html/self_gen/self_gen_tech.doc. Delaware does not have interconnection standards for facilities over 1,000 kW. Rates, terms, and conditions for these facilities are at the discretion of the customer and the utility. Disputes can be brought to the commission—in the past, none have been notable (Dillard 2002). Connectiv Power, Delaware's primary utility, asserts that it attempts to follow the PJM interconnection standards when considering large-scale CHP in its Delaware territory (Mayer 2002).

Emissions Regulations/Rules Specific to CHP

None

Other Barriers or Incentives for CHP

Delaware offers net metering for renewable energy projects under 25 kW—this could be viewed as a precedent for a CHP program.

Florida

State-Level Financial Incentives

There is no state-level financial incentive for cogeneration.

Interconnection Provisions/Net Metering

Florida offers an interconnection standard for qualifying QFs under PURPA and a small photovoltaic generation standard. The Florida PSC saw no reason to further any interconnect standards in the state and non-QF facilities are to coordinate with the utility in the service area (Colson 2002).

Emissions Regulations/Rules Specific to CHP

There are no specific emissions rules for CHP. All power generation facilities over 75 kW need to undergo the same siting procedure outlined in Statute 403 from the 2001 legislative session. This statute can be found at http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=Ch0403/part02.htm&StatuteYear=2001&Title=%2D%3E2001%2D%3EChapter%20403%2D%3EPart%20II. The 403 statute requires that facilities over 75 kW have a “need determination” and in order to receive one the facilities must have a contract with a utility. Because of utility-perceived drawbacks of cogeneration, utilities may deny the contract as a barrier to cogeneration facilities (Swim 2002).

Other Barriers or Incentives for CHP

The Florida governor’s office commissioned a group to outline possibilities for Florida’s energy future. This committee released a report that identified DG as a priority and suggested to the governor that the PSC actively pursue dismantling the inherent barriers (EnergyWise 2001).

Georgia

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

In 2001, the legislature enacted the “Cogeneration and Distributed Energy Act,” which can be found at http://www2.state.ga.us/Legis/2001_02/sum/sb93.htm. This bill allows for small residential (<10 kW) and commercial (<100 kW) facilities to interconnect and receive net metering payments from the utility (GCE 2001).

Emissions Regulations/Rules Specific to CHP

None

Hawaii

State-Level Financial Incentives

HB 175 offers a 4% tax credit for technology infrastructure renovation costs. The language is written in such a way that it includes CHP.

For co-funding and loans, the state of Hawaii offers revenue bonds for independent power producers. More information can be found at

http://www.capitol.hawaii.gov/hrscurrent/Vol01_Ch001-042/hrs039a/HRS_39A.htm.

There was an attempt at passing a bill that would allow faster depreciation of CHP, but the bill was not heard by the legislature.

Interconnection Provisions/Net Metering

Hawaii's four utilities set the interconnection standards. Smaller utilities work on a case-by-case basis.

Hawaii did consider a bill in the 2001 legislative session that would have directed the Hawaii PUC to lift barriers to interconnection. The finance committee did not hear this bill.

Hawaii offers net metering for small renewable projects, but not CHP.

Emissions Regulations/Rules Specific to CHP

None specific to CHP

Idaho

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Interconnections and rates are done on a case-by-case basis between the customer and the utility. Some facilities have successfully completed projects, one of which is the West Boise wastewater treatment plant.

Emissions Regulations/Rules Specific to CHP

None

Other Barriers or Incentives for CHP

Idaho supports net metering for all projects under 100 kW.

Illinois

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

The PUC is in the process of creating a standardized rule (Cuttica 2002).

Emissions Regulations/Rules Specific to CHP

None. Generators less than 1 MW are not required to get an air permit.

Indiana

State-Level Financial Incentives

For information on the following programs, see <http://www.state.in.us/doc/energy/index.html>. Industrial Energy Efficiency Fund provides a loan for production of equipment that will result in significant energy savings.

Distributed Generation Grant Program

Alternative Power and Energy Grant Program provides funds for alternative energy technologies and/or infrastructure.

Interconnection Provisions/Net Metering

The Indiana Utility Regulation Commission is in the process of deciding on a policy. The state has cogeneration rules that cover interconnection in response to PURPA. In 2001, several bills were introduced into the legislature, but none were fully heard.

Emissions Regulations/Rules Specific to CHP

None

Other Barriers or Incentives for CHP

All utilities design their own stand-by tariffs and exit fees.

Iowa

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Neither the Iowa Utilities Board nor the state of Iowa has a uniform policy for CHP interconnection. CHP facilities do need to meet the requirements of a PURPA QF.

Emissions Regulations/Rules Specific to CHP

None

Kansas

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

None as of yet, but in the 2001–2002 legislative session, the Kansas Legislature had 3 bills related to cogeneration and renewables: HR 2631; HR 2633; and HR 2646. Although none of these bills passed, they are on record for further work. The bills can be found at <http://www.kslegislature.org/cgi-bin/bills/index.cgi> (Barnes 2002).

Emissions Regulations/Rules Specific to CHP

None

Kentucky

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Each utility has a tariff in effect for customer-generated power. The agreements are done on a case-by-case basis for each project.

Emissions Regulations/Rules Specific to CHP

None

Louisiana

State-Level Financial Incentives

None. There is not a registry of cogeneration facilities that would allow for communication between a company producing steam and a company requiring it.

Interconnection Provisions/Net Metering

Utilities are required to buy at their avoided cost (McGee 2002). In response to PURPA, the PSC gave a general order (U-14964) and an update (U-22739) that define avoided cost in the state.

Emissions Regulations/Rules Specific to CHP

None

Other Barriers or Incentives for CHP

Louisiana has long used CHP—an adequate amount of electricity was not available in the state, so companies generated their own. This ended when electricity companies convinced businesses that they could buy electricity cheaper than they could produce it. Also in Louisiana, there are production facilities that require more steam than electricity, and sometimes they are partnered with the nearby utility for CHP (McGee 2002).

Maine

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

The Maine PUC adopted “Chapter 360: Cogeneration and Small Power Production” into their regulations for facilities less than 80 MW. The chapter is available at <ftp://ftp.state.me.us/pub/sos/cec/rcn/apa/65/407/407c360.doc>. In this order, only 25% of the total energy input can be coal, natural gas, or oil. The remainder must come from a renewable source.

Emissions Regulations/Rules Specific to CHP

None

Maryland

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

None

Emissions Regulations/Rules Specific to CHP

None

Massachusetts

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Massachusetts Order 220CMR 8 regulates the interconnection of qualified facilities under PURPA. This document is available at <http://www.state.ma.us/dpu/electric/99-38/220finalreg.htm>.

Emissions Regulations/Rules Specific to CHP

The Massachusetts electricity restructuring legislation directs the Department of Environmental Protection to develop an output-based standard for any pollutant determined to be of concern to public health and also to implement at least one such standard by May 2003 (ENN 2001). Massachusetts is awaiting the finalized RAP rule for review (Weston 2002)

Other Barriers or Incentives for CHP

Massachusetts General Legislature Chapter 164, §1G(g); Dept. of Tel. and Energy 97-111, allows for net metering of qualifying facilities under 60 kW.

Michigan

State-Level Financial Incentives

Though it does not specifically mention CHP or DG in its authorizing legislation, the Michigan Energy-Efficiency Fund has helped financed several CHP projects.

Interconnection Provisions/Net Metering

Michigan's interconnection standards are outlined in Case 12485. A summary of this case can be found at <http://efile.mpsc.cis.state.mi.us/cgi-bin/efile/viewcase.pl?casenum=12485>. On-site generation is also covered at <http://www.michiganlegislature.org/law/GetObject.asp?objName=460-10a>.

Emissions Regulations/Rules Specific to CHP

None

Other Barriers or Incentives for CHP

Utility customers in Michigan that provide their own power are exempt from exit fees.

Minnesota

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

CHP facilities of less than 40 kW receive retail rate for excess electricity generated through a net metering law.

Minnesota is in the process of creating a general standard for utility tariffs for interconnection of all DG facilities.

Emissions Regulations/Rules Specific to CHP

All facilities follow the normal generator process for the requirement of an air quality permit. CHP facilities smaller than 5 MW are exempt from further environmental review. For facilities between 25 and 50 MW, the Environmental Quality Board is required to prepare an Environmental Assessment worksheet. An environmental impact statement and a site permit are required for facilities greater than 50 MW (Haase 2002).

Missouri

State-Level Financial Incentives

Large utilities allow a peaking credit for large CHP facilities where generators are notified a day ahead what price they can receive from the utility for power supplied to the grid the next day. These CHP facilities enter into a prior agreement with the utility.

No other state programs are currently available.

Interconnection Provisions/Net Metering

Individual utilities determine interconnection guidelines.

Emissions Regulations/Rules Specific to CHP

None

Mississippi

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Individual utilities determine interconnection guidelines.

Emissions Regulations/Rules Specific to CHP

None

Montana

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Individual utilities determine interconnection guidelines.

Emissions Regulations/Rules Specific to CHP

None

Nebraska

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Because all power suppliers in Nebraska are publicly owned, they would individually set any interconnection guidelines. Rates and tariffs are set by the public body responsible for setting policy for power suppliers. Any power-producing facility in the state must be reviewed prior to construction by the Power Review Board according to standards set in the Nebraska Revised Statute Section 70-1014.

Emissions Regulations/Rules Specific to CHP

None

Nevada

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Individual utilities determine interconnection guidelines.

Emissions Regulations/Rules Specific to CHP

None

New Hampshire

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Individual utilities determine interconnection guidelines.

Emissions Regulations/Rules Specific to CHP

None

New Jersey

State-Level Financial Incentives

New Jersey has a tax credit for the purchase of cogeneration equipment (Bozzo 2002) and a release on gas tax for fuel that is to be used in cogeneration (Brown et al. 2002).

Interconnection Provisions/Net Metering

Regulated by utilities.

Emissions Regulations/Rules Specific to CHP

None

New Mexico

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Standard guideline developed by the PUC in NMPRC Rule 570 in response to PURPA. Energy from qualifying facilities is paid for at the average economy energy price for that month. If dependable capacity is available to the utility, the qualifying facility must negotiate with the utility for the sale of that power.

Net metering for projects less than 10 kW.

Emissions Regulations/Rules Specific to CHP

None

New York

State-Level Financial Incentives

The New York State Energy Research and Development Authority funds the Power Systems Program that has strived over the last 2 years to promote emerging DG technologies. Eighty percent of the program funding has been allotted to CHP demonstration programs. In exchange for being allowed to showcase the technology, NYSERDA co-funds the project. Details can be found at <http://www.nyseda.org/transportation/powersystems.html>.

Order No. 00-E-0005 (see <http://www.dps.state.ny.us/fileroom/doc10691.pdf>) required the PUC to run the Distributed Generation Pilot Program. This is a 3-year pilot program that began in 2000, which will assist the utilities in planning for DG.

Interconnection Provisions/Net Metering

The PSC has revised guidelines for interconnection, which are available at http://www.dps.state.ny.us/94e0952_11152000.pdf. These guidelines are under revision now in an attempt to streamline them based on lessons learned (Worden 2002). The largest utility that does not fall under the jurisdiction of the PSC is the Long Island Power Authority (LIPA). It uses the PSC interconnect guidelines, but the PSC does not receive feedback from the authority on them.

Emissions Regulations/Rules Specific to CHP

The New York Department of Environmental Conservation (DEC) is currently under state order to revise emissions standards for DG. This process has been in process since 2000, and the DEC is currently working on a white paper describing options. This is largely based on California, Texas, and RAP output-based standards (Smith 2002).

Other Barriers or Incentives for CHP

It was generally agreed by all of our interviewees that the largest barrier to DG in New York is the lack of standardized stand-by tariffs. This leaves the tariff to the discretion of the individual utility, and changes in every service area. Many entities in New York are working on the stand-by tariff issue, but interviewees noted that until the issue is resolved, the barriers are too high for DG to become mass-marketed in the state.

North Carolina

State-Level Financial Incentives

The Avoided Costs Program and the Green Power Program

Interconnection Provisions/Net Metering

Utilities determine interconnection standards.

Emissions Regulations/Rules Specific to CHP

None

North Dakota

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

For facilities less than 100 kW, monthly energy is purchased at avoided cost.

Emissions Regulations/Rules Specific to CHP

None

Ohio

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

The PUC has authored standards for interconnection.

Emissions Regulations/Rules Specific to CHP

None

Oklahoma

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

The commission has a rule in response to PURPA. The interconnection issue is under discussion at the commission.

Net metering for facilities less than 100 kW and 25,000 kWh/year.

Emissions Regulations/Rules Specific to CHP

None

Oregon

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

None, except under PURPA. PURPA QFs receive prices based on avoided costs.

Emissions Regulations/Rules Specific to CHP

None

Pennsylvania

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Pennsylvania uses the PJM Interconnection LLC interconnection agreement. Guidelines can be found at <http://www.pjm.com>.

Emissions Regulations/Rules Specific to CHP

In 2001, the Department of Environmental Protection (see <http://www.dep.state.pa.us>) released a resolution to create a larger market for DG. This includes a more rapid permitting process for clean DG. This resolution can be found at <http://www.dep.state.pa.us/dep/subject/advcoun/aqtac/2001/may/res01-1.pdf>.

Rhode Island

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

CHP facilities that wish to sell power to the grid must be registered power producers with the New England Power Pool and sign an interconnection agreement with the local utility. CHP facilities that sell power are listed at <http://www.ripuc.org>.

Emissions Regulations/Rules Specific to CHP

None

South Carolina

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Utilities negotiate interconnections with customers.

Emissions Regulations/Rules Specific to CHP

None

South Dakota

State-Level Financial Incentives

Only for renewable energy.

Interconnection Provisions/Net Metering

Utilities have tariffs that are approved by the PUC.

Emissions Regulations/Rules Specific to CHP

None

Tennessee

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

TVA has interconnection standards for its territory.

Emissions Regulations/Rules Specific to CHP

None

Texas

State-Level Financial Incentives

The Texas emissions for CHP regulations are often viewed as an incentive to use CHP.

Interconnection Provisions/Net Metering

The PUC begun investigating DG in 1998 in an effort to fend off an anticipated capacity shortfall in 1999 and 2000. In 1999, the PUC published an Interconnect Handbook, which is available at <http://www.puc.state.tx.us/electric/projects/21965/dgmanual.pdf>. This includes technical guidelines, as well as implementation guidelines.

Emissions Regulations/Rules Specific to CHP

The Texas Natural Resources Conservation Commission has an exception for CHP in its air quality requirements (TNRCC 2001, available at http://www.tnrcc.state.tx.us/permitting/airperm/nsr_permits/files/segu_permitonly.pdf).

These requirements allow for a credit to be given to generators using CHP, in an effort to encourage the use of CHP in the state.

Other Barriers or Incentives for CHP

There is a variety of CHP discussions in Texas. Texas has the largest installed base of CHP in the United States and has the potential to increase it twofold.

Utah

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Utilities negotiate interconnections on an individual basis with installers. CHP facilities sell power to the grid at the avoided cost rate up to 1 MW.

Emissions Regulations/Rules Specific to CHP

None

Vermont

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

The utility commission is discussing a standardized interconnection rule.

Emissions Regulations/Rules Specific to CHP

None

Virginia

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

The commission is in the process of completing standard interconnection rules.

Emissions Regulations/Rules Specific to CHP

None

Washington

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Utilities negotiate interconnections with customers.

Emissions Regulations/Rules Specific to CHP

None

Other Barriers or Incentives for CHP

None currently, but the state used to offer a cogeneration equipment sales tax break.

West Virginia

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Interconnection in West Virginia follows PJM Interconnection Standards.

Emissions Regulations/Rules Specific to CHP

None

Wisconsin

State-Level Financial Incentives

Provision Wisconsin Statute 196.025(4) of Wisconsin Act 9 required the PSC to develop an incentive program for small-scale electricity generators (PSCW 2001).

Interconnection Provisions/Net Metering

The Wisconsin Distributed Resources Collaborative (WiDR) has been formed and charged

by the PSC to develop interconnection standards for the state. These standards are in draft form and are available at <http://www.wisconsin.dr.org>.

Emissions Regulations/Rules Specific to CHP

None

Wyoming

State-Level Financial Incentives

None

Interconnection Provisions/Net Metering

Utilities in the state negotiate interconnection on an individual basis with customers. There is a net metering provision for systems under 25 kW (IREC 2001).

Emissions Regulations/Rules Specific to CHP

None