

**Regulatory Handbook for Cogeneration Projects in  
Minnesota**  
*Public Review Draft*  
*July 31, 2001*

Prepared by the Minnesota Environmental Quality Board and Minnesota Planning

The Environmental Quality Board and Minnesota Planning request comments on the format, content, and usefulness of this handbook. Written comments may be sent to Suzanne Lamb Steinhauer at either [suzanne.steinhauer@state.mn.us](mailto:suzanne.steinhauer@state.mn.us) (e-mail), or Minnesota Planning, 3rd Floor, 658 Cedar St., St. Paul, MN, 55155 (U.S. mail). Comments should be sent by October 1, 2001.

Funding provided by the Minnesota Future Resources Fund as recommended by the Legislative Commission on Minnesota Resources

## **Cogeneration – What is it?**

Cogeneration, or Combined Heat and Power (CHP), is the simultaneous production of electrical energy and useful thermal energy from a single energy source. A CHP system most commonly utilizes a fuel source to produce steam that can be used to generate electricity and thermal energy that can be used in industrial processes. Because cogeneration produces two useful products from one input, its efficiency is higher than that of conventional power generation.

Conventional power plants that burn coal or natural gas have an efficiency in the neighborhood of 30 to 35 percent. In other words, 65 to 70 percent of the total energy contained in the fuel is lost as heat. Because a great deal of the “waste” heat typically exhausted by conventional thermal generation can be captured as useful thermal heat, expected efficiencies of cogeneration rank in the neighborhood of 80 to 90 percent.

Cogenerating technology has been around for over a century. In fact, the first commercial power plant in the country, Thomas Edison’s Pearl Street Station, provided both electric and steam power to lower Manhattan beginning in 1882. Many of the earliest electric generators were industrial plants that added electric generating equipment to their existing steam systems.

## **Cogeneration – Who might be interested?**

Typical users of cogeneration are large and medium-size industrial and institutional facilities, district heating and cooling systems, and small industrial

plants that need process heat for manufacturing operations.

Technological developments such as microturbines and fuel cells continue to improve the viability of cogeneration for a range of facilities beyond the traditional large industrial and institutional hosts. Manufacturers currently account for 90% of cogeneration use in the United States.

The most important parameters for screening and prioritizing cogeneration opportunities are:

- Size of thermal and power loads and the relationship between the two;
- Thermal and electric load factors;
- Age of existing thermal facilities and plans for replacement or additional capacity;
- Avoided costs and/or potential revenue for generated power; and
- Fuel availability and cost.

Other factors that enter into a decision to install cogeneration facilities include the price of electricity, the cost of fuel, and the ability to sell excess electricity to other customers. Persons considering the installation of cogeneration facilities should determine the status of government deregulation of the utility industry, the price of natural gas or other fuels, the existence of government incentives for cogeneration, and other developments in the energy area.

## **Cogeneration – What are its benefits?**

Cogeneration is economical, environmentally friendly, and reliable.

It can result in cost savings by reducing fuel costs to produce heat and electricity separately. It can also result in reduced emissions of air pollutants into the atmosphere and other environmental benefits such as eliminating wastes. Since the facility is located near the end user, cogeneration is reliable because it reduces demand on electrical transmission and distribution systems.

## **The Regulatory Process**

The purpose of this handbook is to serve as a nontechnical introductory guide to understanding the regulatory process for developing a cogeneration facility in Minnesota. This handbook is not intended as a “how to” guide, and anyone interested in installing a cogeneration facility should seek assistance from those experienced in the permitting process.

Although some requirements imposed on cogeneration facilities are established by the federal government, such as the U.S. Environmental Protection Agency, most regulations in this area, whether state or federal, are administered by state agencies, particularly the Minnesota Pollution Control Agency. Local approval may also be required, in some circumstances.

## **Environmental Review**

Depending primarily on the size of the facility, either an Environmental Assessment Worksheet or an Environmental Impact Statement may have to be prepared on a cogeneration facility. An EAW is a short document designed to help decisionmakers determine whether a more detailed EIS is required. The obligation to conduct environmental review is a matter of state law.

An EIS is required for a cogeneration facility greater than 50 megawatts. For a facility between 25 and 50 megawatts, the Environmental Quality Board is required to prepare an EAW. For a facility between 5 and 25 megawatts, the local unit of government where the facility is located has discretion on whether to prepare an EAW. Any cogeneration facility less than 5 megawatts in size is exempt from environmental review.

An EAW is paid for by the governmental body that prepares the document, although the project proposer will have to supply most of the information. The costs of an EIS are assessed to the project proposer.

An overview of the environmental review process as well as an EAW template and guidelines for preparation are available online at <http://www.mnplan.state.mn.us/eqb/review.html>. Questions about the environmental review process for cogeneration facilities can be directed to the power plant siting staff at the Minnesota Environmental Quality Board at 651-296-2603, e-mail address [eqb@mnplan.state.mn.us](mailto:eqb@mnplan.state.mn.us).

## **Power Plant Site Permit**

Any facility greater than 50 megawatts is required to obtain a site permit from the Environmental Quality Board. Environmental review and public participation are required as part of the permitting process. For facilities that burn natural gas or are less than 80 MW, proposers may opt to pursue permitting with local officials. The EQB assesses the reasonable costs of administering the permit application to the project proposer. More information on the power plant siting program can be found

at the Environmental Quality Board's website, <http://www.mnplan.state.mn.us/eqb/pwrplant.html>. Parties interested in discussing cogeneration projects can contact the power plant siting staff by phone at 651-296-2603, or by e-mail at [eqb@mnplan.state.mn.us](mailto:eqb@mnplan.state.mn.us).

## **Air Permit**

Like all fuel-burning facilities that emit pollutants into the atmosphere, a cogeneration facility will require an air permit from the Minnesota Pollution Control Agency (MPCA). The extent of the analysis and review required by the MPCA depends on the type, size and location of the proposed facility. Facilities that will emit more than 100 tons per year of certain pollutants such as carbon monoxide, sulfur dioxide, or particulates, or facilities that emit hazardous air pollutants like mercury, will be required to undergo a more extensive review than other smaller facilities.

The air permit issued by the MPCA will establish limits on the amount of certain pollutants that can be emitted from the cogeneration facility. The permit will likely contain other conditions regarding monitoring of emissions and reporting. The operator of the facility may have to install control equipment to remove air pollutants from the discharge gases in order to comply with the limits in the permit. There will be a fee assessed by the MPCA for processing the permit.

General information on MPCA's air permit process can be found at the MPCA website, <http://www.pca.state.mn.us/air/permits/index.html#who>. Questions regarding how to proceed with the permitting process or questions regarding specific

facilities can be addressed to the MPCA Air Permit Technical Assistance Hotline: 800-MinnAir or 651-282-5844. The MPCA also has a Small Business Assistance Program that provides free confidential nonregulatory advice to small businesses. The Small Business Assistance Program website, [http://www.pca.state.mn.us/programs/sbap\\_p.html#guide](http://www.pca.state.mn.us/programs/sbap_p.html#guide), provides access to emissions calculators and permit application forms.

## **Other Federal and State Permits**

Further federal and state permits may be required for a cogeneration facility, depending on the specific characteristics of the facility. These permits include:

**Pipeline Permits:** If a new facility will be fueled by natural gas and a new pipeline is required to ship the gas to the facility, a pipeline permit may be required, depending on the size and pressure of the pipeline. The Federal Energy Regulatory Commission (FERC) reviews and permits interstate pipelines, and the Environmental Quality Board permits intrastate pipelines. General information on FERC pipeline permitting can be found on FERC's Office of Energy Projects website, [http://www.FERC.gov/About/offices/offices/oep/about\\_offi\\_oep.htm](http://www.FERC.gov/About/offices/offices/oep/about_offi_oep.htm) or by calling 202-219-2700. Information on the EQB's pipeline routing program can be found at <http://www.mnplan.state.mn.us/eqb/pipeline.html>. Questions concerning this process can be directed to EQB staff by phone at 651-296-2603, or by e-mail at [eqb@mnplan.state.mn.us](mailto:eqb@mnplan.state.mn.us).

**Water Appropriations Permit:** If the facility will be using more than 10,000 gallons per day or one million gallons per year of water, the facility must obtain a

Water Appropriations Permit from the Minnesota Department of Natural Resources. More information on the Water Appropriations Permit can be found at [http://www.dnr.state.mn.us/waters/programs/water\\_mgt\\_section/appropriations/index.html](http://www.dnr.state.mn.us/waters/programs/water_mgt_section/appropriations/index.html) or by calling 651-297-2835.

**Water Discharge Permits:** If wastewater will be discharged into surface or groundwater, a National Pollutant Discharge Elimination System (NPDES) or a State Disposal System (SDS) permit may be needed. For information on these permits, please see <http://www.pca.state.mn.us/water/permits/index.html#required> or contact the MPCA's Customer Assistance Center at 651-296-7162, or toll-free/TDD 800-657-3864.

**Stormwater Permits:** A stormwater permit may also be required. MPCA administers this federal program. More information on the program can be found at <http://www.pca.state.mn.us/water/stormwater.html>.

## **Local Permits**

Generally, local permits will not differ significantly from those that might be expected with any change at a large commercial or industrial facility. Such permits might cover site plan review, zoning, electrical, and plumbing.

## **Other Requirements**

Although this handbook is primarily a guide to the regulatory requirements for building a new cogeneration facility in Minnesota, some non-regulatory issues may have a significant effect on the timing and expense of such a project.

## **Interconnection Requirements**

Virtually all cogeneration facilities will still need to be hooked up to the electrical grid to receive or sell electricity. Facilities will connect with the grid through their electric utility. Interconnection requirements involve two major issues: 1) technical requirements, and 2) contract negotiations and price.

### Technical Requirements

To sell power to a utility, or to receive backup generation, a cogeneration plant must connect with the distribution system without creating safety or technical problems. Technical requirements depend on the size and type of the cogeneration facility, the type of electric service the facility is requesting from their utility, and the location of the facility on the grid.

Each utility has its own technical standards and is responsible for ensuring that changes in the electrical system do not have an adverse impact on regional reliability. Efforts are underway at both the state and federal levels to standardize technical requirements and ensure reasonable interconnection timelines and costs.

### Power Sales Agreements

Selling excess power to a connecting utility or to another customer will require negotiation of price and sales terms. The 1992 Energy Policy Act introduced the option for small producers to sell power at wholesale rates. Though lower than retail rates, wholesale rates are still higher than the avoided cost limitations that have been available to small power producers for over 20 years through the Public Utility Regulatory Policy Act (PURPA).