PROCUREMENT GUIDE:
CHP SITING AND PERMITTING REQUIREMENTS

1. Overview

Obtaining the required utility interconnection, environmental compliance, and construction permits is an essential step in the CHP project development process. Permit conditions often affect project design, and neither construction nor operation may begin until all permits are in process or in place. The process of permitting a CHP system will typically take from 3 to 12 months to complete, depending on the location, technology, and site characteristics.

One critical set of requirements are the approvals necessary for connection with the servicing utilities, both natural gas and electric. There are also a number of pre-construction, construction, and operating approvals that must be obtained from a variety of local government jurisdictions for any CHP project. The more involved government approval procedures are those required by the local planning and building departments, fire department, and air quality district. Local agencies must ensure that a CHP project complies with:

- Local ordinances (e.g., noise, set-backs, general planning and zoning, land use, and aesthetics).
- Standards and codes (e.g., fire safety, piping, electrical, and structural).
- Air emissions requirements (e.g., NO_x, CO, and particulate standards).

Approvals may be in the form of a permit or license issued after an agency has verified conformance with requirements, or may be in the form of a program (e.g., landscaping, noise monitoring) that must be developed to ensure that the environmental impacts are mitigated.

The number of permits and approvals will vary depending on project characteristics such as the size and complexity of a project, the geographic location, the extent of other infrastructure modifications (e.g., gas pipeline, distribution), and the potential environmental impacts of construction and operations. Key government agencies and other entities involved would be the city or county planning agency, the fire marshal at the respective fire department/authority, the city or county building department, the environmental health department, the air district, and the local distribution utility.

2. Required Approvals

CHP installations typically require the following types of permits or approvals:

- Local utility company approvals
  - – Electric utility interconnection study and approval
  - – Natural gas connection/supply
- Local jurisdiction pre-construction and construction approvals
  - – Planning department land use and environmental assessment/review

– Building department review and approval of project design and engineering (based on construction drawings)

– Air quality agency approval for construction

- Local jurisdiction post-construction and operating approvals

  – Planning department and building department confirmation and inspection of installed CHP source

  – Air quality agency confirmation that CHP emissions meet emissions requirements

In general, facilities that need a construction permit also require an operating permit.

3. Overall Permitting Process

A typical basic pre-construction/ construction-phase permitting process for a CHP project within any given entity (utility company or government agency) involves three major steps:

1. The owner or developer completes and submits application forms, accompanied by fee payment(s), to the relevant entity.

2. The entity reviews the application for completeness. In this step, the entity and the developer may complete a number of rounds of information exchange before the application is considered complete and accurate.

3. The entity completes its review and issues the relevant approval/permit.

The approval process may also feature one or more meetings between agency or utility staff and the project developer or development team. More importantly, in some states and government agencies, public comment periods are added to Step 2 to allow interested parties to review and comment on the completed application. The comment periods are usually a minimum of 30 days in length. The agency then addresses the comments received, usually explaining why they did or did not incorporate or act on specific suggestions. Public review processes can add months to the approval process.

The post-construction/operating phase adds a fourth step for many state and local government approvals and for utility interconnection approval:

4. The agency/organization confirms that the installation does not deviate from the approved application and/or that it conforms to the applicable requirements, and issues the related approval or permit. This step often involves a site inspection by an agency official. If the agency determines that the project falls short of compliance, the developer takes the steps necessary to bring it into compliance. As in Step 2 above, this may be an iterative process, with a number of rounds of developer corrections and agency re-inspections.

The success of the permitting process relies upon a coordinated effort between the developer of the project and the various entities that must review project plans and analyze their impacts. Project developers might have to deal with separate government agencies with overlapping jurisdictions, underscoring the importance of coordinating efforts to minimize difficulties and delays. There are a number of steps that the developer can take to facilitate the permitting process:

- ***Hold preliminary meetings with key regulatory agencies.*** Meet with regulators to identify permits that may

be required and any other issues that need to be addressed. These meetings also give the developer the opportunity to educate regulators about the project, since CHP technologies might be unfamiliar to regulators.

- ***Develop permitting and design plans early.*** Determine the requirements and assess agency concerns early on, so permit applications can be designed to address those concerns and delays will be minimized.

- ***Submit timely permit applications to regulators.*** Submit complete applications as early as possible to minimize delays.

- ***Negotiate design changes with regulators in order to meet requirements.*** Permitting processes sometimes provide opportunities to negotiate with regulators. If negotiation is allowed, it may take into account technical as well as economic considerations.

4. Utility Interconnection Requirements

These include the technical and contractual requirements for interconnection to the local electricity grid for those systems that will operate in parallel with the utility. "Parallel with the utility" means the CHP system is electrically interconnected with the utility distribution system at a point of common coupling at the site (common busbar), and facility loads are met with a combination of grid and self-generated power. Interconnection requires various levels of equipment safeguards and utility approvals to ensure that power does not feed into the grid during grid outages.

Historically, negotiating the technical and contractual requirements for parallel grid interconnection has often been problematic for CHP installations. Each utility has had its own specific requirements that have sometimes appeared to be arbitrary, overly complicated and prohibitively expensive. The situation is improving, however: regulatory intervention, agreement standardization and equipment certification initiatives at the federal and state levels are helping to provide better definition and certainty to both the technical and contractual requirements for interconnection approval.[4] Streamlining and standardization of interconnection is being promoted with the intent that small, low-impact CHP projects can be reviewed quickly and cost-effectively, and the technical and equipment requirements will be only as complex and expensive as required for safe operation.

While standardization of the technical and contractual requirements for parallel grid interconnection is not yet nationwide, the approval process typically includes the following steps:

1. ***Application***
   A formal application is filed with the servicing electric utility. This application usually asks for information on the location, technical and design parameters, and operational and maintenance procedures for the planned CHP system. The level of detail required

[4] A number of states have developed streamlined procedures and established timelines for interconnection approval for systems below certain capacity levels (New York, Texas, and Delaware among others); Both the Federal Energy Regulatory Commission (FERC) and the National Association of Regulatory Utility Commissioners (NARUC) have issued proposed rules and/or model guidelines that would promote standardized interconnection procedures and business terms for small distributed generation resources connected to the grid; IEEE 1547 has been issued, providing a "Standard for Interconnecting Distributed Resources with Electric Power Systems" that addresses the performance, operating, testing, and safety requirements of interconnection hardware and software.

and application fees can vary considerably from one utility to another.

2. ***Interconnection studies***
There are a number of technical interconnection studies that might or might not be required, depending on the size and configuration of the CHP system and the specific requirements of the servicing utility:

– *Minimum engineering review.* Designed to identify any adverse system impacts that would result from interconnection of the CHP system. Examples of potential negative impacts to the grid include exceeding the short circuit capability of any breakers, violations of thermal overload or voltage limits, and inadequate grounding requirements and electric system protection.

– *System impact study.* Required if any adverse impacts are identified in the minimum engineering review. Designed to identify and detail the impacts to the electric system operation and reliability of the proposed CHP system, focusing on the potential adverse system impacts identified in the engineering review.

– *Facility study.* Might be required if the system impact study indicates that grid system reliability would be adversely affected by interconnection of the CHP system. This study would identify and design any required facility or system upgrades that might be necessary to maintain grid integrity.

The costs of the studies are typically paid by the applicant, but can be negotiated with the utility. It is important to execute specific agreements with the utility if specific studies are required. These agreements should outline the scope of the study and requirements and include a good faith estimate of the cost to perform the study.

3. ***Interconnection agreement***
There are also contractual issues that must be addressed in parallel to the technical requirements for interconnection. The interconnection agreement will cover such issues as back-up services, metering requirements, inspection rights, insurance requirements, and the responsibilities of each individual party.

4. ***Power purchase agreement***
If sales of excess power to the grid are contemplated, the terms and conditions of power purchases would be contained in a separate power purchase agreement (PPA) between the utility and the site. Primary considerations for a PPA include:

– *Term.* The contract term should be sufficient to support financing and/or the life of the project. A typical term can be 10 years or more.

– *Termination grounds.* The grounds for contract termination should be limited in order to protect the long-term interests of all parties.

– *Assignment.* The contract should consider assignment for purposes such as financing or changes in ownership.

– *Force majeure.* Situations that constitute force majeure (e.g., storms, acts of war) should be identified and agreed upon; otherwise this clause could be used to interrupt operations or payment.

– *Schedule.* There should be some flexibility allowed for meeting milestone dates and extensions (e.g., in penalty provisions such as non-performance).

This provision is necessary in case unforeseen circumstances cause project construction delays.

– *Price.* The value of sales of power to the grid will typically be based on the utility's avoided cost or some negotiated rate, either of which will be close to the wholesale commodity costs for power (i.e., not the higher retail rate displaced by power used on-site). Many utilities have a standard offer contract for FERC qualifying facilities.[5]

The utility should establish a definitive period of time in which to process the application and studies, and provide one of the following notifications to the applicant:

- Approval to interconnect.
- Approval to interconnect with a list of prescribed changes to the CHP system.
- Justification and cost estimate for prescribed changes to distribution systems that are required to accommodate the CHP system.
- Application rejection with justification.

The time period for the review and approval process can vary depending on the number and level of studies required and the organization of the utility itself. Some utilities have assembled a handbook of procedures, options, and draft contracts. In these cases, the procedures will be relatively orderly and straightforward, and the process will be expedited. Other utilities have dispersed the responsibilities. In such cases it will take time to determine the right contacts and all the specific interconnection requirements. States that are streamlining the interconnection process have targeted a time period of 4 to 6 weeks for review and completion of a simple interconnection application. In general, the larger the project, the more complex the interconnection scheme; if there are specific issues with the section of the grid being accessed (e.g., rural lines or weak distribution areas), the higher the costs both for studying the interconnection configuration and for the necessary electrical equipment to interconnect.

It is recommended that the local utility be contacted early in the project development process in order to identify interconnection requirements and potential issues. A useful starting place for a potential applicant is to identify existing onsite generation systems that have already been connected with the utility and gather information on their requirements and application process. The EPA CHP Partnership can often help identify such sites.

5. Local Zoning/Planning Requirements

Project siting and operation are governed by a number of local jurisdictions. It is

[5] In 1978, the Public Utilities Regulatory Policy Act (PURPA) required an electric utility to buy electricity from power projects that are granted Qualifying Facility (QF) status by FERC. Under this provision, the electricity would be bought at the utilities' current avoided cost rate. However, the federal Energy Policy Act of 2005 amended PURPA; for new contracts, utilities are no longer required to buy or sell excess power from QFs if the cogeneration facilities have access to transmission services and wholesale markets.
In 2006, FERC issued a proposed rule to repeal the mandatory purchase obligation in Day 2 Regional Transmission Organization (RTO) territories: Midwest ISO, PJM, ISO New England, and NYISO. At the time of this writing, FERC has not issued a final rule. For Day 1 RTOs or markets of comparable competitive quality, the mandatory purchase obligation will be evaluated on a case-by-case basis.
A power project is granted QF status as either a "small power producer" or a "qualifying cogenerator" after meeting certain fuel or efficiency requirements, as amended by FERC in 2006 (see FERC Docket No. RM05-36-001; Order No. 671).

important to work with the appropriate regulatory bodies throughout all stages of project development in order to minimize permitting delays that cost both time and money. Applicable local agencies include:

- County and city ***planning bureaus*** govern land use and zoning issues. They may conduct environmental impact assessments, including noise studies, and are responsible for compliance with local ordinances. For example, most local zoning ordinances stipulate the allowable decibel levels for noise sources and these levels vary, depending on the zoning classification at the site. The local zoning board or planning bureau determines whether or not land use criteria are met by a particular project, and can usually grant variances if conditions warrant.

- State and local ***building and fire code departments*** address CHP-related safety issues such as exhaust temperatures, venting, natural gas pressure, fuel storage, space limitations, vibration, gas and steam piping, and building structural issues. Building departments are often part of a city's planning division. Most CHP projects require a building permit.

- The ***environmental/public health department*** looks out for public health and safety, focusing on hazardous materials and waste management requirements.

- ***Water/sewer and public works authorities*** rule on water supply and discharge matters. Typically, they ensure that a project is compliant with the federal Clean Water Act; decide whether local water and wastewater quality standards will be or are being met; and evaluate waste streams that empty into lakes, rivers and other bodies of water.

6. Local Air Quality Requirements

Air quality agencies/districts at the state and local levels are responsible for administering air quality regulations, with a primary focus on air pollution control. The primary criteria pollutants of concern include NO_X, CO, SO_2, particulates, and certain hazardous air toxics. Local air agencies ensure that a project complies with federal and state Clean Air Act mandates. These authorities issue construction permits based on their review of project design and performance objectives. After construction and installation is complete, projects receive operating permits based on emissions performance relative to applicable emissions thresholds. Issues that air agencies consider include exemption thresholds[6] (e.g., capacity, emission levels), controlled emission levels, type of fuel(s) fired, proximity to sensitive receptors (e.g., schools, day cares, hospitals), siting at a new location or an existing site (e.g., commercial building, industrial facility), and a demonstration that projected emission levels are met via source testing.

Major characteristics that typically differentiate projects for air permitting purposes include:

- Does the CHP system trigger permit requirements? If it is not exempt, what relevant emissions threshold is it below or above?

[6] Agencies typically have a rule for which equipment and processes are exempt from permitting, a rule that is often based on whether the equipment falls below a given emissions threshold. Exemptions may also exist based on the type or function of the equipment, e.g., if it is emergency standby generation or a fuel cell installation, or if it has been precertified.

- Is the site in an attainment area?[7] Non-attainment areas feature more rigorous guidelines.

- Is the site an existing or new facility? Is the site currently considered a major emissions source or a minor emissions source? Adding a new source of emissions to an existing major source can trigger additional permitting requirements; adding a new source to an existing minor source may move the facility into the major source category.

- Do emissions of criteria pollutants and air toxics affect surrounding communities? If it appears that the source's emissions may affect public health, air quality modeling or an evaluation study may be necessary.

Up-to-date information on state emissions requirements for CHP and other onsite generation systems can be found at:

www.eea-inc.com/rrdb/DGRegProject/index.html

7. Permitting Costs

Siting and permitting can require significant investments of time and money in researching, planning, filing applications, meeting with officials, and paying fees. Interconnection, environmental regulatory, and local government agency approval costs may approach 3 to 5 percent of project costs for smaller systems and need to be included in any CHP project economic evaluation. Equipment needed to ensure compliance, such as air pollution control equipment or noise abatement equipment, would be in addition to these fees.

[7] When an area does not meet the air quality standard for one of the criteria pollutants (ozone, nitrogen dioxide, carbon monoxide, sulfur oxides, particulate matter, and lead), it may be subject to a formal rule-making process that designates it as in "nonattainment." The Clean Air Act further classifies ozone, carbon monoxide, and some particulate matter nonattainment areas based on the magnitude of their problems. Nonattainment classifications may be used to specify what air pollution reduction measures an area must adopt, and when the area must reach attainment. The technical details underlying these classifications are discussed in the Code of Federal Regulations, Part 81 (40 CFR 81) and on the U.S. EPA Web site: *www.epa.gov*.